
**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)**

Submitted by

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Submission

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

Griffin has been involved in the REGWG from its first meeting in April 2008. The REGWG was originally a MAC constituted body to be chaired by the Office of Energy. The brief scope of works for the group, as defined by the Office of Energy, was (*emphasis added*):

“The Renewable Energy Generation Working Group has been established to consider and assess potential system and market issues *arising from the increase in the national Mandatory Renewable Energy Target to 20%*.

The working group is tasked with identifying priority issues and proposed directions for resolution of these issues to the Market Advisory Committee (MAC) in May 2008. Recommendations could involve amendments to the Wholesale Electricity Market Rules (Rules) or proposals for further analysis. *The working group will also refer any other issues that emerge back to the MAC for further consideration as required.*

A report will be presented to MAC for consideration at its meeting on 11 June 2008.

The Office of Energy (OOE) will chair and provide secretariat support for the group. The working group will draw upon the information and resources of its members to develop its analysis and recommendations.”

After a period of relative inaction, the IMO assumed responsibility for chairing the REGWG. The IMO scope of works was similar to that of the Office of Energy:

“The Working Group will consider and assess system and market issues *arising from the increase in the national Mandatory Renewable Energy Target (MRET) to 20%*. This will include an examination of the current Wholesale Electricity Market Rules to determine whether the integrity of the Wholesale Electricity Market Objectives can be maintained.

In particular, the Working Group will focus on the treatment of renewable energy generation in the Reserve Capacity Mechanism, allocation of ancillary service charges and low-load compensation mechanisms.

In order to complete its scope of work, the Working Group is requested to:

- identify priority issues arising, or that could arise, from increasing penetration of intermittent renewable energy generation in the South West interconnected system;
- determine the appropriate framework for analysis of issues and options for resolving them against the Market Objectives; and
- submit its assessment, analysis and conclusions in a report to the Market Advisory Committee (MAC).”

The IMO created four work packages, one of which engaged a consultant to investigate the current methodology for allocating capacity credits to all intermittent generation (IG) in the SWIS. This included making recommendations for any changes to this methodology for it to better achieve the Market Objectives, giving regard to the likely increase in renewable generation (and IG) facilities in the SWIS due to the MRET legislation. It is widely acknowledged that solar PV facilities are not allocated sufficient capacity credits and it was suspected by many that wind farms were allocated too many capacity credits.

The subsequent report from consultants MMA proposed a preferred new methodology which aligned the capacity credits to the average output from IGs during periods of system peak demand (i.e. over the highest 750 intervals¹). This is more consistent with how the market awards capacity credits to scheduled generation. The analysis, based on all available data from existing and planned wind farms, as well as modelled data for solar PV and other solar thermal facilities, suggested a significant improvement to the quantity of capacity credits for solar PV and a very similar quantity of capacity credits to wind farms, compared with the existing methodology.

Late in the process, two other methodologies were introduced to the REGWG by participants (ostensibly the Office of Energy and System Management). These were introduced based on the perception – not borne out in the analysis, but potentially occurring if the analysis used a data set that contained a one-in-ten-year hot season – that system security may be put at risk if the current level of capacity credits were continued to be awarded to wind farms. It is at this point that the legitimate concerns of the System Manager, which plays an important role in the operation of the WEM, should have been referred to the MAC. The MAC should have been allowed to take an objective view of both the concerns raised and the scope of works and existing work packages of the REGWG and instruct the REGWG to consider another

¹ It also introduced the concept of Load for Scheduled Generation (LSG)

stream of work that addressed these concerns around system security. By progressing the way it did, the REGWG ended up in a position where methodologies for new rule changes were being proposed which attempted to address an issue related to, but not properly encompassing the issues identified in the scope of works². The IMO has submitted a proposed rule change based on that originally presented in the REGWG by the Office of Energy (RC_2010_25). It is Griffin's belief that progression of RC_2010_25 will have a detrimental impact on the WEM and will lead to wider policy and market failures with regard to the likely impact of federal MRET legislation. This is counter to the objectives of the REGWG and would represent a very poor outcome of IMO and MAC process. Griffin strongly opposes the progression of RC_2010_25 and is disappointed that the IMO chose to submit such an obviously flawed proposal.

The federal MRET legislation acts to set the renewable power percentage (RPP) which in turn delivers investment in renewable generation and RECs. The price of RECs is governed by the supply and demand situation throughout Australia. A REC is fungible across jurisdictions, so a REC produced in the NEM is equivalent to a REC produced in the WEM. It is important to note: the WEM does not physically require renewable generation (or IGs) to operate. In fact, absent the MRET or an equivalent price on carbon, it would be unlikely that any renewable generation facilities would be built at all – that is, they are not economic without the direct subsidy. The reason an investor chooses to build a renewable generation (or IG) facility in the SWIS is that they can make adequate returns on their investment. With the price of a REC being set nationally, this means that, assuming all other costs are equal³, the renewable investment will occur in the WEM when the non-REC revenue attributed to the output of the facility is greater or equal than that from another jurisdiction⁴. Integral to this is the fact that the output of a facility in the WEM will carry an energy value and a capacity value. This is a fundamental difference to the NEM, where the non-REC commercial value of the output of the facility is attributed to the energy price of the relevant NEM region only. Reducing the capacity value of the output (as will be the case under RC_2010_25) leads to a reduction in the comparable value of the facility in the WEM relative to the NEM. In short, it acts to discourage investment in IGs in the SWIS.

What are the outcomes of discouraging investment in IGs in the SWIS? There are two likely scenarios that will emerge if RC_2010_25 proceeds.

1. There will be a loss of investment in IGs in the SWIS as investors seek the greater (and more stable⁵) returns in the NEM. This may initially seem like efficient market forces at work (allocative efficiency), however this scenario will likely lead to greater costs in the WEM over the long term. As the price of RECs will remain the same across Australia, retailers in the SWIS who purchase RECs may be caught in a position where the cost of energy in the WEM is higher and/or rises more rapidly than in the NEM. If they had purchased RECs bundled with the unit of energy as a single price (as is the common way of bilaterally contracting the output of such facilities), they would be hedged against such differences in jurisdictions (i.e. the relative cost of the REC in the bundled WEM output would be lower compared to a REC in the NEM). If not, they will face the common REC price (set nationally) as well as the higher local energy prices⁶. This will lead to higher

² Namely the expected increase in IGs in the SWIS in response to federal MRET legislation

³ A simplification – construction and operating costs are generally higher in WA than the east coast, though this may be somewhat offset by higher capacity factors in the SWIS.

⁴ And, importantly, when there is a demand for and an offtaker for the energy produced from the facility.

⁵ The regulatory risk impacts of progressing RC_2010_25 will not be lost on sophisticated investors.

⁶ The same logic applies if the relative price of energy remains the same but the price of RECs rises

costs to consumers in the SWIS to meet the federal MRET targets. Additionally, there will be a macro-economic impact in the state as investment (mostly in regional areas) is foregone. In fact, WA consumers who pay for the MRET subsidy via electricity tariffs will be subsidising new investment and jobs in regional centres in the eastern states. This would be a substantial policy failure for WA, given the government's commitment to the Ministerial Council on Energy to contribute its share of investment to reach the national 20% by 2020 targets under MRET.

2. The other scenario is that RC_2010_25 will not impact investment in IGs in the SWIS. In this instance, given that investors will still seek their required returns on investment, it is likely that consumers will meet the additional costs of the IGs. This may be as a result of retailers paying a premium to hedge their positions with respect to divergent energy prices between the WEM and the NEM; or may be as a result of state intervention to a substantial policy failure, where state enterprises invest in uneconomic projects to maintain the vestige of a policy of investment in renewable energy sources. *Importantly, under this scenario, the perceived issue around system security is not addressed. We will still have investment in IGs in the SWIS, they will just be less efficient and cost consumers more!*

Whatever its merit, the federal MRET legislation is in force and will have an impact on the WEM. The REGWG was tasked with identifying these impacts, then identifying how the WEM might manage them. RC_2010_25 is a poor response to this. The consultant engaged by the IMO on behalf of the REGWG (MMA) has approached the issue in a manner more consistent with the scope of works of the REGWG. That is, MMA has developed a methodology that it believes will accommodate a greater penetration of IGs in the WEM (as is expected in response to the MRET legislation) in a manner that will incentivise new IG entrants to produce energy at times of peak system demand – which in the WEM normally occurs during summer afternoons. Put simply, if an IG facility does not consistently produce energy during times of high system demand, **then the quantity of capacity credits it receives will be reduced**⁷. RC_2010_37, submitted by Griffin, is based on the methodology developed by MMA. We believe that this methodology, of those considered by the REGWG, best meets the objectives of the REGWG as well as the Market Rules. It is relatively simple, transparent, is consistent with the existing methodology (reducing the perception of regulatory risk) and, fundamentally, incentivises output at times when the market most requires it.

Simplicity in regulated markets is underrated. Complicated market structures act as barriers to entry. RC_2010_25, with its interdependency on fleet performance, introduces a risk to potential investors where the value of their own investment is linked to the output of other facilities and to the management and maintenance of those facilities by third parties. Introducing complicated new concepts into the market rules is simply not warranted. On this point, Griffin questions the value of the Load for Scheduled Generation (LSG) concept introduced by MMA⁸. While clever in its origin, we do not believe that introducing a new concept that applies only to a small section of the Market Rules is necessary. We believe that it would be better to incentivise output based solely on actual demand. Absent IGs, peak demand is normally met by peaking energy facilities. These use gas, or as is becoming more

⁷ This is a substantial departure from the existing methodology and exposes existing and under development wind farms to higher risks.

⁸ Griffin retained the LSG concept in its proposed rule change as it was consistent with the MMA methodology from the REGWG, where it appeared to have general support. It was not, however, a concept that had its merit properly debated, as it was considered an adjunct to the core methodology.

prevalent in the WEM, diesel and DSM. Diesel peakers are very expensive, with SRMC between \$400-\$700/MWh (depending on the international price of oil). Marginal gas for peaking plants will also be expensive in our new emerging gas supply paradigm. IG's, with a SRMC of around \$0/MWh⁹, will have the effect of lowering the cost of supply in the STEM and balancing markets. This is not a trivial outcome.

Load shedding will always occur in energy markets. The alternative is to build such redundancy as to make the cost prohibitive. There is no doubt that despite the extraordinary reliable summer afternoon sea breeze that originates of the south west coast of WA¹⁰, there will be periods of high demand (correlating with high temperatures) where the wind resource is not available. This is akin to the fact that modern scheduled generators (gas turbine or thermal steam driven generators) are also extremely reliable. However they are not infallible and, from time to time, will be unavailable when required. The Market Rules use refunds and other penalties to attempt to incentivise availability from these facilities. However ex-post penalties will not prevent load shedding in real time due to the loss of a scheduled facility. And given that IGs only receive around 35-40% of their installed capacity anyway (in the case of wind farms), there is already an explicit devaluation of the installed capability of these facilities – far greater than the annual expected capacity refunds of scheduled facilities or DSM. This is despite the fact that IGs will almost certainly operate at or near their installed capacity more often and deliver a far greater quantity of energy into the market (at much lower price) than will most peaking facilities and DSM. There is a real case to suggest that IGs are *undervalued* by the current capacity allocation method in the Market Rules – with regard to their efficient and reliable contribution of energy into the market¹¹.

Griffin believes that the System Manager may have a legitimate concern regarding the possibility of one-in-ten-year load shedding event due to an increased penetration of IGs in the WEM. However, RC_2010_25 is not an appropriate response. This concern should be the subject of a separate review of the system security and reserve margin settings in the WEM. This issue should have been raised by the REGWG as part of its scope of works. It was not and worse still, it migrated to a related but distinct work package where it distorted the considered output of that package. Given the call for a mandatory review of the Planning Criterion contained in Market Rule 4.5.15 is nearing, Griffin strongly recommends that the issues raised by System Management in the REGWG relating to load shedding potential be managed in this process, sometime in 2011¹².

The scope of works for the REGWG and for Work Package 2 (regarding capacity credit allocation) was clear. The consultant MMA produced a logical and technically robust report, utilising all available data, suggesting a general methodology that recognised the potential for increased penetration of IGs in the WEM and subsequently awarded capacity credits to these IGs in a manner which would incentivise output during peak periods. Griffin has taken what it believes to be the most appropriate version of this general methodology (2A in the context of the REGWG nomenclature) and proposed Rule Change RC_2010_37 (with the exception that we believe there is little merit in incorporating the LSG concept and would

⁹ A simplification. While the resource is free, there are some variable maintenance costs associated with IG's. And the fact that they can earn a REC means that real SRMC would be less than \$0/MWh.

¹⁰ The CIA 'The World Factbook' describes the Fremantle Doctor as "one of the most consistent winds in the world", <https://www.cia.gov/library/publications/the-world-factbook/geos/as.html>

¹¹ Bearing in mind that renewables are economically inefficient *per se* and receive direct subsidies in the form of RECs – however, as has been made clear in this submission, this is the economic reality in which the WEM operates and which needs to be considered when analysing outcomes.

¹² Griffin notes the large workload already planned for 2011, but also acknowledges the importance of this issue.

prefer the allocation to be based simply on the top 750 intervals by demand). We strongly recommend that the IMO rejects RC_2010_25 and endorses RC_2010_37.

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

Markets cannot effectively function by only giving regard to the set of Rules governing its operation at the expense of ignoring all other inputs. The SKM report for the IMO Maximum Reserve Capacity Price Working Group suggests that:

“In determining what is appropriate, however, SKM recognises that the Market Rules, including their Market Objectives, are but one element of a suite of market and regulatory arrangements that ultimately influences the operation of the market. Other elements include related systems, procedures, guidelines, regulatory instruments, institutions, assets and processes of change and reform. Together these shape decisions, implement processes and guide the behaviour of participants in the market. Accordingly, while the Market Objectives can provide some specific guidance of what is appropriate in the context of the WEM, on their own they are not sufficient.”¹³

While the federal MRET legislation; and state government policy around responses to this legislation are a very significant inputs influencing the WEM, Griffin understands that the rule change process places high regard to the impacts of potential changes on the Market Objectives. We contend below that RC_2010_37 is far superior to RC_2010_25 in better achieving the Market Objectives and that RC_2010_25 is actually detrimental to the Market Objectives when compared to the current methodology.

- (a) *to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system*

It is argued that RC_2010_25 will promote system security in the SWIS. This is not the same as promoting the ‘reliable production and supply’ of electricity. Extensive modelling, using all available data and historical evidence suggests that the correlation between the wind resource in the south west of WA during summer afternoons and peak demand periods is high. This can be expected by a sea breeze that is one of the most reliable in the world, not to mention one of the world’s best solar resources. RC_2010_37 is best placed to align IG output with peak demand in the SWIS, hence better promote the reliable production of electricity when it is required.

The premise of improving security of supply is that RC_2010_25 will either reduce the quantity of new IGs in the SWIS, or ensure that a larger capital base is installed to meet the IMO forecast capacity requirement¹⁴. There is every likelihood

¹³ SKM, “Calculation Methodology to be Applied in Determining Deep Connection Costs”. Interim Discussion Report, pg. 14

¹⁴ If a 100MW wind farm has its capacity credits reduced from 40MW to say 15MW, then an additional 35MW of capacity will need to be installed to meet the same load forecast, increasing the capital base.

that if RC_2010_25 proceeds, IGs will continue to be built in WA, but at a higher cost. This may not impact the numbers of IGs in the System (only make them more expensive), nor limit the perceived problem of the System Manager. Additionally, it has been argued in the body of this submission that there are better ways of achieving security of supply (and increasing the capital base) without distorting the market for renewable energy.

RC_2010_25 will almost certainly reduce the economic efficiency of the market. It is unlikely that making new investment in IGs in the SWIS less competitive with respect to in the NEM will mean that no more investment is made. Retailers will pay a premium to hedge their exposure to diverging energy costs in different jurisdictions (and the impact this has on the relative value of a REC). And the state government will likely intervene to address policy failure by building non-commercial facilities. In both cases, consumers will face higher prices for their renewable energy.

RC_2010_37 will enable investors to meet hurdle rates at a lower cost to consumers. The value of the output of wind farms will be higher than that under RC_2010_25 and roughly equivalent with the current methodology. The value of solar facilities will be roughly equivalent with that under RC_2010_25 and higher than the current methodology.

Generally, outcomes under RC_2010_37 are likely to better promote Market Objective (a) than outcomes under RC_2010_25 or the current methodology.

- (b) *to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors*

RC_2010_25 will have a big impact on the ability of new investors to finance IG projects in the WEM. It acts as an explicit disincentive, lowering the value of the output of a facility compared to RC_2010_37 or the current methodology. Financiers will be very likely to seek better and more stable returns in other jurisdictions. There will be less competition to win the limited investment opportunities for new renewables in the SWIS (there is only so much additional growth each year in the SWIS), and a probability that some of this investment will be made by state owned entities due to the lack of commerciality. The risk profile of RC_2010_25, where individual facilities are interdependent with the fleet with regard to setting capacity credit allocation quantities will also deter investors – and hence competition.

RC_2010_25 will have a large negative impact on Market Objective (b) compared to RC_2010_37 and the current methodology for wind farms though a positive impact for solar.

RC_2010_37 will have a neutral impact compared to the current methodology for wind farms. IGs bear the greater risk of producing output during a smaller period (during peak demand periods only), however this is offset by the fact that the wind resource in the SWIS is very reliable and has a positive correlation to peak demand periods. It will have a positive impact on Market Objective (b) for solar.

- (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*

RC_2010_25 will reduce the incentive for new IGs to be constructed in the SWIS. It will also have a large negative impact on the asset values of existing IGs. Without making similar changes to other capacity types (scheduled generation and DSM), this discriminates against IGs – a sustainable energy technology that is free of greenhouse gas emissions. RC_2-010_25 fails Market Objective (c) completely.

Existing data suggests that RC_2010_37 may or may not discourage new investment in IGs or impact the asset values of existing facilities (the capacity allocation for wind farms is very similar to the current methodology – perhaps slightly more conservative if anything). Its impact on Market Objective (c) could be considered neutral

Both proposals have a similar positive impact for solar.

- (d) *to minimise the long-term cost of electricity supplied to customers from the South West interconnected system*

As has been discussed in the body of this submission, the long term cost of electricity in the SWIS will almost certainly increase under RC_2010_25. This will occur from a number of outcomes:

The IMO forecast of demand will still need to be met. By decreasing the quantity of capacity credits to IGs, there will need to be a greater capital base installed to meet the forecast demand. This cost will be borne by consumers.

If retailers in the SWIS are unable to hedge their REC positions by pegging the REC with the underlying MWh commodity that produced it through a bundled electricity price, then they will end up paying more if either the national price of RECs rises; or if the price of energy in the SWIS rises at a greater rate than that in the NEM (and given our step change in gas prices, this is likely). These additional costs will ultimately be borne by consumers.

By discouraging competition for those IGs that are built; and with retailers (looking to hedge their REC positions against diverging energy markets) forced to pay a premium due to the reduced value of the output from IGs, new IG facilities will be more expensive. Investors will maintain their returns (they will seek other markets to invest if returns are not adequate), so it is consumers who will end up paying the additional costs.

IGs produce energy. The SRMC of IGs is \$0/MWh. Output from IGs during peak periods displaces gas fired and liquid fired peaking generation, with SRMC of up to \$700/MWh. By discouraging new investment in IGs, it is likely that STEM and balancing prices will be higher.

Given that the existing data suggests that RC_2010_37 may or may not discourage new investment in IGs or impact the asset values of existing facilities, it is unlikely to lessen or improve Market Objective (d) compared to the current

methodology.

- (e) *to encourage the taking of measures to manage the amount of electricity used and when it is used*

Both RC_2010_25 and RC_2010_37 incentivise output from IGs to coincide with peak demand periods. This is likely to bring forward the adoption of storage technologies as they become commercially viable.

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.

The adoption of RC_2010_25 will have a significant negative impact on the asset value of the Emu Downs Wind Farm. It will also be likely to wipe out the option value (and the sunk development costs) for the Badgingarra Wind farm development project. The timing of the release of the IMO sponsored rule change proposal, in the middle of the well publicised sale process of Emu Downs Wind Farm and the Badgingarra Wind Farm development project, has created uncertainty and as a result, compromised the sale process of these assets. Given our strong belief, outlined in this submission, that RC_2010_25 is a manifestation of poor process and so demonstrably inconsistent with the Market Objectives, Griffin and our joint venture partners Stanwell Corporation are angered and disappointed that the IMO chose to submit it.

The adoption of RC_2010_37 may or may not have an impact on the value of the Emu Downs Wind Farm and will be unlikely to have any impact on the progression of the Badgingarra Wind Farm project.

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

There will be no time sensitive implementation challenges to either proposal.
