24 July 2020
Mr Peter Adams
General Manager, Market Performance
Australian Energy Regulator
GPO Box 520
Melbourne VIC 3001

Dear Mr Adams,

Subject: Submission to AER RE: Issues paper – Semi scheduled generator rule change(s) – June 2020

Edify Energy (**Edify**) welcomes the opportunity to submit our views on the issues raised by the AER with respect to semi scheduled generators responding in real-time to unfavourable pricing outcomes. We acknowledge that this behaviour can be detrimental to system security, particularly in a future that is increasingly dominated by generation from variable, renewable resources. However, we also identify inefficiencies in the preferred options tabled by the AER and consider them to be disproportionate to the issue at hand, as detailed further in this response.

In summary, our proposal is for the AER to:

1. Consider whether upcoming reforms such as Mandatory Primary Frequency Control (**PFC**) and 5-minute settlement (**5MS**) will mitigate any of the undesirable effects reported in the issues paper, thereby reducing the requirement for any change;

2. Where change is still determined to be required, Edify endorses a rule change, but limited only to one that '*prohibit[s] the installation or use of either systems or procedures that allow for, or automate, a reaction to price that does not match their target*'; and

3. If changes to NER clause 4.9.8 are still deemed to be required, then these changes should allow semi scheduled plant to generate both below *and* above their forecast output, subject to an un-forecast and verifiable change in resource availability, except where a semi-dispatch cap is applied. During periods where a semi-dispatch cap is applied, semi scheduled plant should maintain the requirement to prevent generation above the cap while continuing to meet their target subject to an un-forecast, verifiable loss of resource.

Consideration of other rule changes

Edify's preference is to first request that the AER further consider if a rule change is necessary and proportionate to the issue at hand, or whether the operational behaviour issues identified are sufficiently contained and able to be remedied through existing compliance processes. Edify also requests that the AER examines the interplay of upcoming rule changes including Mandatory PFC and 5MS, including to what extent these rule changes could serve to reduce or minimise the issues identified by the AER.

Mandatory Primary Frequency Control

Once Mandatory PFC settings are introduced, and assuming no timely rebid is submitted indicating an intention to shutdown, semi scheduled plant operating in frequency responsive mode that attempt to shutdown based on a negative spot price could be in violation of their Mandatory PFC settings and thus be forced to generate if system frequency was low. Similarly, semi scheduled plant that attempt to over generate on a high price (in the unlikely scenario they were not already operating at full capacity) whilst grid frequency was high would have this instruction over-ruled and output curtailed in response to the high frequency signal.

5-minute settlement

Similar analysis can also be considered for the 5MS rule change. Although the 5MS rule change does not prevent a semi scheduled generator from turning down during a dispatch interval with a negative price, it is instructive to examine the interaction of this rule change with the Mandatory PFC rule change. The 5MS rule change may increase the likelihood that market prices initially settle at a higher magnitude of negative price when compared to a market with 30-minute settlements.

Possible interaction between 5MS and Mandatory PFC

As discussed above, a generator in frequency responsive mode with Mandatory PFC settings applied, should be limited from ramping down during a low system frequency event, assuming no timely rebid was made indicating their intention to shut down. Combining the possible effects of the Mandatory PFC rule change with the possible effects of the 5MS rule change results in a higher likelihood that: a) the market could settle at a higher magnitude of negative price; and b) generators may be forced to generate through this in order to comply with their Mandatory PFC settings. This interaction of rule changes may by themselves provide sufficient deterrents to continued incidences where participants intentionally shut down their generation with no prior rebid or corresponding target change.

Unnecessarily curtailing renewable generation will increase energy costs

Due to the inherent challenges in forecasting wind and solar resources, particularly during fluctuating weather conditions, the actual output of wind and solar plants are frequently over or under their forecast values. Presently, these deviations occur across a fleet of geographically distributed generators in the NEM, so serve to introduce a self-performing balancing effect of combining overs and unders and mitigate the procurement requirements of regulation FCAS.

By mandating semi-scheduled generators to follow dispatch instructions unless only a '*loss of resource*' occurs, semi scheduled generators will be forced to curtail their output when more resource is available than forecast. This serves to both reduce the amount of low-cost renewable energy delivered to the market and removes the self-performing balancing effect of overs that the system would otherwise be naturally providing in lieu of procuring through regulation raise FCAS markets, which compounds total system cost outcomes.

Estimating losses across the NEM due to the rule change

If we consider the aggregate impact of this rule change in FY 2019-20, we determine an approximate total system cost of ~$71.7 million, based on the following assumptions:

- There was 770 GWh of generation over forecast and 960 GWh under forecast observed across all semi scheduled wind and solar generators in the NEM, before losses, which across the NEM are assumed to be 0.9 (i.e. average MLF of 0.9);
- By removing this 770 GWh of over forecast generation and for simplicity assuming both a degree of coincidence with under forecast generation and an even distribution across the year, this would result in an average increase in the net regulation raise FCAS requirement of ~87MW (i.e. 770 GWh / 8760 hours);
- At an average price of regulation raise FCAS of $35/MW/hr, this would have resulted in an additional system cost across the year of ~$26.7 million (i.e. 87MW x $35/MW/h x 8760 hours); and
- Furthermore, the market value of this lost energy at an average spot price across all NEM regions of $65/MWh was ~$45.0 million (i.e. 770 GWh x 8760 hours x 0.9).

It should be noted here that with the removal of overs from renewable plant and the subsequent increase in demand on regulation raise FCAS services, we can expect a commensurate price increases in procuring this service. Therefore, the true cost of balancing this lost energy is likely to be higher than the current average of $35/MW/h.

The effects described will be compounded as further renewables are integrated into the system and will ultimately translate into higher energy bills for consumers, contradicting the price efficiency metric of the National Electricity Objective.

Taking an individual asset perspective, the 50MW_{AC} Hayman Solar Farm, managed by Edify, observed 6.6 GWh of over forecast generation in FY 2019-20. At an average captured solar price of $42/MWh, excluding LGC's and an MLF of 0.86, this would have resulted in a lost revenue outcome of $240 thousand, before any increases in FCAS costs are considered.

Changes endorsed by Edify

Do other rule changes adequately address the issue?

In the first instance Edify, would like to encourage the AER to further consider whether the magnitude of the issues highlighted warrant any change at all, and whether other rule changes such as Mandatory PFC and 5MS may help to mitigate the issue.

Minimise undesirable impacts

If the AER assesses that a rule change must be made, then it is Edify's view that the rule change should make as few changes as possible so as not to introduce additional and unforeseen issues. To that end, Edify endorses the option to '*prohibit the installation or use of either systems or procedures that allow for, or automate, a reaction to price that does not match their target*'.

We note the concern of the AER in being able to enforce this type of rule. To that end, we believe that an additional requirement to mandate that semi scheduled plant send Active Power Control setpoints to AEMO during each dispatch interval is an appropriate means of monitoring and enforcement. Although this would not, in and of itself, prevent semi scheduled generators from reducing their output in response to a negative price, this additional monitoring may create a sufficient deterrent to alter behaviour and would be proportionate to the magnitude of the issue, which has been limited to a handful of isolated cases to date.

Don’t unnecessarily curtail renewable Generation

Finally, if the AER assesses that it is necessary to mandate that semi scheduled generators follow dispatch targets, then NER clause 4.9.8 should be amended such that semi scheduled plant is allowed to both fall short of and exceed their dispatch target, subject to an un-forecast and verifiable change in resource availability, unless a semi-dispatch cap is set.

When a semi-dispatch cap is set, semi scheduled plant would be required to curtail generation to their semi-dispatch cap level, subject to an un-forecast, verifiable loss of resource. Therefore, even during a semi-dispatch cap interval, in lieu of any resource loss, the mandate for semi-scheduled generators to follow their target, prevents semi-scheduled generators from ‘switching off’, unless a timely rebid was made notifying the market of their intentions. Importantly, this approach also allows the system to maximise renewable resources without unnecessarily curtailing low cost, renewable generation and increasing energy costs.

If you would like to discuss any of the issues raised in this submission, please contact Manas Choudhury on +61 434 630 939 or manas.choudhury@edifyenergy.com or myself, with details below.

Sam Hill
Head of Asset Management

sam.hill@edifyenergy.com
D +61 2 8790 4032
M +61 421 723 821