25th August 2016

Clare Greenwood
Energy Forecasting
Australian Energy Market Operator

Submitted Electronically:

Infigen Energy Limited
Level 22, 56 Pitt Street
Sydney NSW 2000
Australia
T +61 2 8031 9900
F +61 2 9247 6086
T +1 214 515 1124
www.infigenenergy.com

Dear Ms Clare Greenwood,

Re: Energy Conversion Model Consultation – Second Stage – August 2016

Infigen Energy Limited appreciates the opportunity to make a submission in response to the Second Stage consultation on amendments to the Wind and Solar Energy Conversion Model (ECM) prepared by AEMO 2016.

The related bodies corporate of Infigen Energy Limited that participate as semi-scheduled generators in the NEM are Woodlawn Wind Pty Ltd and Lake Bonney Wind Power Pty Ltd, but for convenience we will simply refer to "Infigen Energy" in this submission.

As stated within the first round of consultations, Infigen Energy supports the proposed ECM changes as they identify areas of improvement of the forecasting and dispatch of intermittent generation in the NEM. AEMO have identified several areas for further investigation and Infigen Energy are eager to be involved in this process going forward.

Our submission on AEMO's draft determination on the ECM amendments relates to the key amendments regarding the draft determinations on the Local Limit, Possible Power and the newly proposed Extreme Wind Cut-out signal in the wind ECM.

Should you have any queries regarding this submission, please do not hesitate to contact me directly by telephone (02) 8031 9971 or email niva.lima@infigenenergy.com.

Yours sincerely,

Niva Lima
Manager Operations Control Centre

Draft Determination on SCADA Local Limit

The SCADA Local Limit is a setpoint that would help address the correct determination of the wind farm's capacity in certain circumnstances and improve the forward 5 minute dispatch instruction.

Infigen Energy agrees with the definition of the SCADA Local Limit in large part but would request the definition be updated to "Transient limits of less than **10-minute** duration" rather than 5-minute as this would more accurately exclude transient limits potentially applied on the park.

Infigen Energy strongly agrees further investigation is needed of semi-scheduled generators availability bidding and PASA be included into NEMDE as well as increasing transparency of semi-scheduled generation operation going forward.

Draft Determination on SCADA Possible Power

Infigen Energy supports that SCADA Possible Power should be included in the ECM guidelines and believes it would be the most accurate source of possible power that would improve overall system forecasting.

There should be no obstacle in incorporating the SCADA's Possible Power setpoint to AWEFS in the same way all other data points are being sent and used. The data would be the closest to the true reflection of the wind farms capability in real time taking into accounts individual turbines operational status and ambient conditions, something which AWEFS is not capable of doing nor should it be. If wind farms wish to improve performance and progress in the space of providing frequency control ancillary services to the market it is crucial that forward 5 minute forecasting is as accurate as possible. If this information comes from SCADA then many of these issues can be resolved.

Requested Signal SCADA Turbines Extreme Wind Cut-out

Proposed Definition:

SCADA Turbines Extreme Wind Cut-out – Provided by Cluster – Wind only – Mandatory, except by agreement with AEMO.

This is the number of turbines counted in the Turbines Available signal that are currently in cut-out mode due to extreme high wind speed or extreme wind direction change.

If agreed with AEMO, this signal may be provided at a farm level.

1. **Do you agree with the definition and proposed use of this signal?**

Infigen agrees that there is a need to improve how high wind speed and extreme wind direction change cut outs are incorporated into the dispatch timeframe. These stops are part of the normal operation limitations of the wind farm and are able to significantly reduce the output of the wind farm in a short time for an unspecified period of time. High wind speed cut out parameters are already provided to AEMO and AWEFS through the turbine power curves.

The proposed signal would retrospectively provide information regarding which turbines were offline due to high wind speed cut outs. By the time that the signal has gone through, the turbines are already offline and the wind farms generation levels will have already dropped off. For the next dispatch interval, this information will be able to inform a more accurate UIGF determination however this will not help with visibility and predispatch forecasting of the wind farms resource. Infigen believes that the additional information provided in this signal should also be used by the AWEFS vendor to further tune the wind farms power curves through these high wind periods. This benefit to visibility and generation forecasting is something that should be further investigated.

Further Infigen Energy would request clarification on how this signal would be incorporated into the UIGF calculation process.

Infigen agrees that the SCADA Turbines Extreme Wind Cut-out signal could improve the dispatch of semi-scheduled wind farms but does not believe that this would fully address the issue associated with ambient condition stops, in particular visibility in the predispatch time frame. Infigen believes that further investigation and research should be done to address this issue.

2. **Is your wind farm able to provide this signal?**

Yes Infigen's wind farms would be able to provide this signal with some additional engineering work.

3. **What upfront and ongoing costs do you estimate your farm(s) will face to provide this signal?**

The upfront cost of implementing the SCADA Turbine Extreme Wind Cut-out will vary across Infigen's wind farms however the ongoing costs are not expected to be high.

4. **Do you consider other options more suitable for managing extreme wind cut-out?**

The proposed SCADA Turbine Extreme Wind Cut-out signal would help improve the dispatch outcomes once the turbines have stopped due to high winds or extreme direction changes, however the current proposal does not help improve the overall forecasting and predispatch of these extreme wind scenarios. Infigen Energy think further investigation should be done to further advance the predispatch forecasting of these events, rather than incorporating this information once turbines have cut out. This would enhance both the dispatch of semi-scheduled wind farms and overall power system security.

Conclusion

Infigen Energy believes that while the Local Limit and Extreme Wind Change Cut-out signals will help improve dispatch outcomes for semi-scheduled wind farms there is still a requirement for further investigation into the forecasting of wind farms in the NEM and the overall transparency and visibility of the operation of semi-scheduled wind farms. Infigen Energy hopes there will be further discussion of the new amendments and further opportunity for collaboration on the points flagged by AEMO for further investigation.