9 November 2016

Clare Greenwood
Energy Forecasting
Australian Energy Market Operator

Submitted Electronically:

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Dear Ms Clare Greenwood,

Re: Energy Conversion Model Consultation – Third Stage – November 2016

Infigen Energy Limited appreciates the opportunity to make a submission in response to the Third 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.

Infigen Energy has submitted in the two previous rounds of consultation and appreciates the opportunity to engage with AEMO and the wider industry to improve the accuracy and efficiency of intermittent generation dispatch.

Infigen Energy supports the implementation of the SCADA Local Limit and changes to the definition of SCADA Wind Speed – Farm Level definition. This submission's focus is on the amendments outlined in AEMO's Draft Determination regarding the signals SCADA Turbines Extreme Wind Cut-out and the requested feedback regarding SCADA Estimated Power.

Should you have any queries regarding this submission please do not hestitate 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

SCADA Local Limit – Mandatory, unless otherwise agreed by AEMO

In MW, the SCADA Local Limit for a wind/solar farm is the lower of its plant availability and all technical limits on the capacity of its connection assets to export energy.

When implemented in AWEFS/ASEFS1, the SCADA Local Limit is used to cap the UIGF for the wind/solar farm in the dispatch timeframe.

The SCADA Local Limit excludes limits on a transmission network and distribution network (to ensure AEMO's compliance with clause 3.7B(c)(6) of the Rules), and may exclude other limits managed by AEMO through the central dispatch process.
Limits already communicated in the SCADA Turbines Available signal may be excluded from the SCADA Local Limit.

Manually-applied transient limits not intended to apply at the end of the next dispatch interval may be excluded from the SCADA Local Limit.

The SCADA Local Limit should not exceed the higher of the nameplate rating and the Maximum Capacity of the wind/solar farm.

Infigen Energy agrees that the SCADA Local Limit should only reflect technical limitations on the park and as such agrees with the introduction of this to the definition of the SCADA Local Limit.

Requested Signal SCADA Turbines Extreme Wind Cut-out

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. If agreed with AEMO, extreme wind direction change may be excluded.

Infigen Energy believes that this adds undue burden to wind farm generators by requiring the creation of a data point that will offer little benefit. The information captured by this point looks at the turbine status for two very particular event codes and doesn't look at the event codes for other ambient condition stops and would only provide information once the high wind stops occur.

This signal comes with a proposed change to the definition of SCADA Turbines Available. The combination of this change with the SCADA Turbines in Extreme Wind Cut-out would mean this information was sent to AEMO through two different signals. Infigen believes this requirement is unnecessary and the update of SCADA Available Turbines in conjunction with a tested and validated SCADA Estimated Power signal would provide a more efficient and accurate dispatch.

Infigen Energy believes the definition of Available Turbines should be reviewed, but agrees with the amended version.

SCADA Estimated Power

SCADA Estimated Power is the Generator's forecast in MW of active power at the end of the next dispatch interval, subject only to technical factors affecting operation of its generation and connection assets.

SCADA Estimated Power should be calculated assuming that no distribution or transmission network constraints apply to the next dispatch interval, and may assume that other limits managed by AEMO through the central dispatch process do not apply to the next dispatch interval.

The SCADA Estimated Power should not exceed the higher of the nameplate rating and the Maximum Capacity of the wind/solar farm.

Implementation of this parameter is dependent on AEMO being satisfied that its accuracy and implementation concerns are addressed. AEMO will then issue a market notice to this effect and post it on its website.

After implementation, AEMO will retain discretion to reject data that does not pass its initial and ongoing validation and accuracy assessment.

1) **Do you agree with the name "Estimated Power"?**

Infigen has no issue with the name Estimated Power and believes it adequately reflects the definition of the set point.

2) **Should limits on connection assets be included or excluded from this definition?**

Individual turbine level data and information would be captured within the SCADA Estimated Power which would provide a much more accurate power estimation than a value derived from average site wind speed used in AWEFS, for example. Infigen Energy believes that the SCADA Estimated Power signal should be a representative estimate of what the wind turbines will be able to produce in the next dispatch interval and as such should not include limits on the connection assets, as this is separate to the turbines capability and will already be reflected within the SCADA Local Limit. The two data signals should remain separate as they provide different information and the UIGF will be based on the lower of the two.

3) **Is one signal enough? Is there a need for a second signal such as a dynamic rate of change?**

One signal is enough, there is no need for a second signal if the Estimated Power signal is working effectively. A dynamic rate of change signal may only reduce the accuracy of the dispatch forecast.

4) **Do you have concerns about interaction between the "Estimated Power" value and the existing bid of ramp rate?**

The "Estimated Power" value should take into account the wind farms actual ability to achieve the setpoint at the end of the dispatch interval, in other words, should theoretically take into account the technical ramp rate of the park at any given time and in changing conditions. We expect that the "Estimated Power" would interact with bid ramp rate in the same way UIGF does. Infigen Energy has no concern with the interaction between the "Estimated Power" value and the exisiting ramp rate bid. The "Estimate Power" signal's purpose is to provide an accurate estimate to AEMO, to complement the estimate obtained by AWEFS and therefore be fed into NEMDE for dispatch determination. AWEFS

is not a dispatch engine, nor does Estimate Power propose to replace the dispatch target.

5) **Do you agree with the level of detail in the definition?**

Infigen Energy agrees with the level of detail in this definition. The definition gives a clear description of the expectation of the data point without defining exactly how it should be calculated (as this may vary from participant to participant).

6) **Any other comments on the definition?**

Infigen Energy would query what level of accuracy is adequate and how this would be determined. AEMO state that it would retain the ability to reject data that does not pass its initial and ongoing validation and accuracy assessment. Infigen request clarification regarding whether this pertains to the initial adequacy assessment? Or would the data point be subject to a "data quality" test, potentially similar to the data test outlined in earlier consultation stages for the SCADA Local Limit?

Infigen Energy believes it would be important to ensure that the accuracy of the SCADA Estimated Power signal is maintained over time however requests further clarification from AEMO regarding this point.

Conclusion

Infigen Energy is largely supportive of the amendments make in the third stage of consultation. Infigen does not agree with the implementation of the SCADA Extreme Wind Cut Out signal as this and more information can be more efficiently captured with the proposed SCADA Estimated Power and the possible revision to the Turbines Available data point. Infigen views the addition of another signal regarding solely wind related turbine stops as an unneccessy requirement.

Infigen Energy fully supports the development of the SCADA Estimated Power signal. Infigen acknowledges that this may be a many staged process requiring review and validation steps and is eager to continue to work with AEMO, industry participants and OEMs on this data point.