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Submission re: Relevant level method review 2018 - Capacity valuation for intermittent generators draft report, 21 December 2018

To the ERA,

Thank you for the opportunity to comment on the above draft report.

The current relevant level method

I agree with the report findings that there are shortcomings with the current method and that it should be replaced for the reasons outlined in the report. In addition I comment as follows.

As the penetration of intermittent generators in the SWIS grows to significant levels, the current method does not properly credit these generators for the capacity they provide when it is most needed and valuable. This is when the highest loss-of-load (LOL) probability would otherwise occur, due to a minimum surplus of generation capacity over total demand, if the fleet of intermittent generators were not present at all.

Without the fleet of intermittent generators present, the highest LOL probability would occur when system demand is highest, in extreme hot weather events, except for situations where significant generation is out of service for scheduled maintenance such as in late spring or autumn. These latter situations are able to be managed by AEMO controlling how much generation is allowed to be out of service, whereas AEMO cannot control extreme weather events.

Under the current relevant level method, with the intermittent generators present, the better they perform (the higher their output) in high system demand periods (the highest LOL periods without them), the more likely their capacity contribution gets determined at some other time when their output is lower. The highest LOL period gets moved by their good performance to other times when their output is lower. The current method "moves the goal posts" to times when their output is less valuable and so is credited less with less capacity credits. This is an obvious shortcoming in that it takes away the incentive for intermittent generators to perform better when needed.

The proposed numerical method

I support the report's proposed (numerical) method for allocating capacity credits to intermittent generators, providing it can be implemented at reasonable cost and will provide sufficient confidence that the intermittent generator fleet output, when needed, will match the level of capacity credits allocated to the fleet to a sufficient level of reliability. Past performance would be a good test of this for existing generators.

The proposed method determines the intermittent generator fleet's effective load carrying capability by modelling the LOL probability with, and without, the fleet present. This seems to be a

good approach for determining the overall impact and capacity value of the fleet. The current method does not do this comparison.

With regard to the allocation of capacity credits to individual intermittent generator facilities, as distinct from the fleet, I support the proposal to base this on their performance in high capacity value intervals (see report section 4.1.1), such as peak demand periods, and perhaps peak LSG periods too (see suggestion 1. below that may influence this), as proposed.

Further analysis suggestions

I recommend two small areas of additional investigation before finalising the report recommendations:

1. That the 'peak demand intervals' versus the 'peak LSG intervals' comparison shown in Table 1. of the report be repeated for the prior year - from the beginning of the trading day on 1 April 2015 to the end of trading day on 31 March 2016 - to compare which intervals would be selected using the two methods.

   I recommend this because the suggested year includes the SWIS's highest-demand summer to date (peak on 8 February 2016) and is the closest to a 10% PoE demand year in recent times. This additional comparison may show interesting outcomes more representative of a 10% PoE year on which the Reserve Capacity Target (RCT) is based.

   The two summers since then (including the 16/17 summer analysed in the report) have been very mild, from a peak demand weather perspective, and so may not be very representative of the more extreme weather years that drive 10% PoE weather events and demand.

2. That the analysis discussed in the report around Figure 4.[1] be supplemented by investigating the correlation of the estimated capacity value determined for each year in figure 4. with how extreme each year was from a PoE perspective. This may, or may not, show some correlation between more extreme weather years and particular levels of calculated capacity value in figure 4.

   One way to do this relatively easily is to examine past AEMO ESOO (Electricity Statement of Opportunities) reports covering these years to identify the amount of 'normalisation' (weather correction) AEMO applied to the actual peak demands in those years to determine their "10% PoE adjusted historical value" for each year as shown in Table 26 of the 2018 ESOO.[2] A milder-year actual peak would have been adjusted upwards more, and a more-extreme-year peak would have been adjusted upwards less. AEMO did not adjust the actual 8 February 2016 peak demand at all because AEMO determined this to be a 10% PoE peak. This indicates it was a more extreme year.

   Selecting capacity values such as discussed in the report around figure 4. could be based on the results for more extreme weather years to reflect the fact that the RCT is based on a 10% PoE year forecast.

[1] Figure 4. Estimated capacity value of the fleet of intermittent generators using the proposed method, 2019/20 capacity year, entire year and hot season time series scenarios

[2] See: https://www.aemo.com.au/-/media/Files/Electricity/WEM/Planning_and_Forecasting/ESOO/2018/2018-WEM-ESOO-Report.pdf

The future capacity value of large-scale centralised photovoltaic facilities will be low

Rooftop PV SWIS peak demand reduction has reached its limit

My view is that without battery storage, customers installing more PV capacity 'behind the meter' will not reduce the hot weather maximum demand further than it has already been, because the maximum demand now occurs near sunset when PV output drops off rapidly to zero.

For the same reason I consider that large-scale, centralised PV installations will not have very much capacity value in future, with regard to reducing the need for other generation at the time of system peak demand, because their output around the new, later (sunset) time of system peak demand will be very low.

Demand-side resources capacities

Referring to the section on demand-side resources on page 46 of the technical appendices to the report, I doubt that it is valid to consider "demand side capacities as firm generators" (for the whole year) in any analysis or modelling as stated.

The dispatchable demand response capacity (DSM) that was/is in the market was/is only available for dispatch when the participating customers (via aggregators) were able to reduce their demand by their contracted amount and this is not available at all times. It is more available during the daytime (less overnight, if any) and would have been selected if it was available on very hot days in the afternoons when system peak demand tended to occur.

It is a suitable capacity resource for extreme weather peaking demand and for the reserve margin capacity of the RCT, with a limited number of dispatchable hours per annum.

Such capacity needs occur very infrequently and so this demand side capacity was/is not dispatched very often. That would be the key reason outage rates would not have been logged with System Management.

The later system peak (around sunset) may also reduce the availability of some of this demand response capacity from businesses that shut down before the evening peak because they would not be able to reduce demand by as much at that time.

Conclusion

In general I support, with the qualifications mentioned above, the replacement of the current relevant level methodology with the proposed numerical method because the latter should give a more valid determination of the capacity value of intermittent generators.

Thank you for the opportunity to comment. I would be pleased to elaborate on these matters if you wish.

Yours sincerely,

Noel Schubert