ERA Paper
Relevant level method review 2018 Capacity valuation for intermittent generators
18/02/2019

We support the new methodology based on Effective Load Carrying Capacity based on Loss of Load Probabilities for determining the amount of capacity to be awarded. It would appear to go to the heart of the issue, grid reliability and, particularly as penetration of the grid by renewables is only increasing, having sufficient generation capacity at all times.

We support combining averages from both peak loads and peak (loads minus non scheduled generation) in dealing with so called intermittent generation.

Our preferred option for determining capacity value of the fleet of intermittent generators is to use the five year sample method.

We have some additional comments, see below;

kind regards
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Comment on low cost of renewables not needing to be part of the RCM

We have concerns about the idea that wind and solar plant are now becoming so cheap that they do not 'need' capacity credits.

As wind and solar plant penetration becomes greater, they have bigger impact on final balancing prices, and because they have low (solar, almost zero, wind modest $/MWh for moving parts) running costs, this pushes prices down.

This downwards pressure is most obvious during clear middays or high wind events. It is also why wind and solar (at least at the utility scale) will always need some support mechanism.

Since 2001, green certificates (Large Generators Certificates, 1 LGC = 1MWh) have been the support financial mechanism to assist wind and >100kW solar plant. Based nowadays on target of generation of 33,000 GWh/yr by 2020 and applied to retailers with the none tax deductable penalty of $65/LGC for non compliance, a market was set up for LGCs.

The Abbott government's effort in reducing the target down from the original 43,000 GWh/yr by 2020 dramatically slowed down investment and consequent installation of new wind and solar plant for a number of years. The lack of RE install along with the annually increasing target the market price to new heights has resulted in LGC spot prices of over $80 for a few years now. In parallel, the cost of wind and solar plant continue to fall.

The long period of high LGC prices and dropping costs have recently combined to produce a tsunami of new projects which are currently being built out. These numbers sum to a bigger number that the target actually requires.

For solar plant alone across the country, we had installed;

2017 1,500MW
2018 3,500MW
and considerably more is expected for 2019.

Here in WA, in the past 12 months, we have had 20MW of solar at Emu Downs, 10MW of solar at Northam, both tracking, and 130MW of wind plant commissioned at Badgingarra (Lancelin). And because of the RCM we know we will be getting 30MW of solar at Byford and 100MW of solar at Merredin, by October 1st of the year.

As of the 30th of January, the spot price of LGCs is $38/MWh. As the dramatic buildout of wind and solar plant continues across the country, we expect the price to drop further. Some projections suggest $24 by next year.

Without a replacement for the LGCs or a tax on carbon pollution, we see further construction of wind and solar plant unlikely behind the current wave of installs without the certainty of capacity credits, as modest as they will become for renewables with increasing penetration.

In light of this, we suggest that the RCM remains important to wind and solar development in WA.

Batteries and the RCM

Is a battery a load or a generator? It is, of course, both but at different times. However, it is a generator only after first being a load.

The maximum spot price on the WEM is never more than about $300/MWh compared to over $13,000/MWh on the NEM. This is because of the RCM. On the west coast, battery storage does not have the possibility of earning $13,000+/MWh, and so needs to be part of the RCM.

Batteries are

- 100% dispatchable but with limited hours
- are behind inverters so have the control and speed of inverters and suffer no ramp rates.

Two questions for batteries getting reserve capacity credits;

i) How long? 4 hours (8 time intervals) has been suggested
ii) What is the trigger for discharging?

Given that BOM advises of very high temperatures about a week in advance, I would suggest that it would be pretty safe to assume that batteries would have 100% State of Charge ready for the peak load event.

8 time intervals does sound excessive when looking at, for instance, solar, which will only have less output with each successive time interval given how late in the evening rooftop solar now pushes peak loads - this, of course, is not the case with wind.

With no ramp rate, dispatch will be instant but what is the criteria for discharge?

Weather is not fuel

The paper also seems to give the impressive that wind and solar generation are equally random.

For a start, despite many jurisdictions suggesting that wind and solar plant have 'fuels' (the Clean Energy Regulator for instance), they do not, it is merely the opportunistic harvesting of sunshine and wind in real time.

While they cannot generate more than is available at the time, they can easily generate less.

By comparison, the output of baseload generators such as coal cannot be varied easily or quickly. By definition, they are designed to be run at a constant output and so are not despatch able.

Then there are gas peakers, mid merit gas turbines and diesel gensets are designed to be ramped up and down. Their output can be controlled by a governor to react to load changes either directly off the drive shaft or indirectly by remote control.

This is quite different to wind and solar, they are not controllable . . . to a point. Once wind and solar plant are curtailed/reach their rated maximums, they can regulate output up to the degree to which they are curtailed.

During clear days in summer, the output of solar plant will be about the same everywhere, increasing from dawn to max output midday then declining to nothing at dusk. Then there are overcast days where again the output will be the same everywhere. Variation between solarfarms will only occur when there is cloud. Whereas with wind, the output of windfarms will be different with the very rare times when there is insufficient wind anywhere to turn rotors, or when a very large front passes over the south west and there is sufficient wind for all windfarms to be at full rated output. Maybe less than a couple of dozen hours a year.

Negative RCM

Given that there appears no discussion about closing down more old coal (Muja CD are rapidly approaching their design lives), perhaps we should propose introducing a negative RCM. That is, instead of a financial incentive for investors to install capacity, we apply a financial discentive for current operators of baseload generation to cease operations during low load / high solar times, ie the middle 6 hours of the day in December. The balancing spot market already has negative pricing but it would appear that that is still insufficient for Synergy to announce the closure of Muja C.

Timing

Given that closure of plant can happen immediately without impacting on system security, there need not be the two year cycle we have for the RCM.

Target

An initial suggestion is how ever much it takes to get the Final Balancing prices down to zero. Though it needs to be remembered that old baseload plant is in discrete units of around 200MW.