reposit

14 November 2023

Climate & Energy Action Division
NSW Government

Response to upcoming Peak Demand Reduction Scheme Rule Change

Context

The NSW Peak Demand Reduction Scheme awards certificates (PRCs) in return for taking actions which reduce peak demand in NSW, particularly in the summer months. The summer peak demand period is defined as from 2:30pm - 8:30pm AEST. The upcoming rule change incorporates battery storage into the PDRS, awarding certificates for installation, and for inclusion in a demand response VPP.

Reposit Power has been developing residential battery control and VPP management solutions for close to a decade in Australia, and continues to do so, with a well informed perspective on how these assets contribute independently and collectively to peak demand reduction.

Stance

Reposit Power welcomes the inclusion of battery energy storage systems (BESS) in the PDRS. Furthermore, Reposit Power acknowledges the effort to incentivise Demand Response VPP participation of BESS through the BESS2 category. However, the calculation methods used to evaluate the peak reduction provided by BESS is done with little consideration for why BESS provides peak reduction, and how this could be maximised. If BESS capabilities are under-valued in the PDRS calculation methods, then the PDRS will not contribute to motivating ideal BESS contribution to peak reduction. Implementing methods which award greater value for greater reduction at critical times will offer more sustained incentive for peak reduction activity.

Review of Rule Change

In appraising the calculation methods used, Reposit Power would like to highlight that there is a considerable difference in peak reduction by battery systems, depending on the realtime (or near-realtime) incentives to do so. The peak reduction activities of a BESS can be categorised into two forms:

a) Self-consumption, where a BESS meets behind-the-meter load only, with regular solar feed-in tariffs offering no incentive to sell stored energy into the grid.

b) Export-incentivised, where a BESS will discharge into the grid in response to a strong incentive to do so, such as a dynamic network price signal, a market spot price, demand response dispatch or network support dispatch.

It is understood that BESS1 represents peak reduction occuring under (a), as this is the typical operating behaviour that can be expected of any installed battery, and BESS2 is intended to represent the additional peak reduction available **when** (b) occurs via demand response.

'**When'** becomes the variable of interest here, because this is an incentive-driven behaviour. Increase the value or frequency of incentives, and peak reduction achieved over a given summer will be greater. Unfortunately, this relationship is not easily leveraged under a certificate scheme. Reposit Power acknowledges that the formulation for volume of certificates which can be generated for DRSP participation may be intentionally dampened, as there is no guarantee that, beyond registration of a BESS into a demand response VPP, any particular volume of demand response will be delivered. In fact, the earlier portion of the 2pm-8pm peak demand window has some overlap with the time window in which minimum demand conditions can occur. While not yet a significant issue in NSW, it is worth considering that BESS can offer solutions to both peak and minimum demand scenarios, provided incentives are provided at appropriate times.

Suggestion - Dynamic Network Price Inclusion

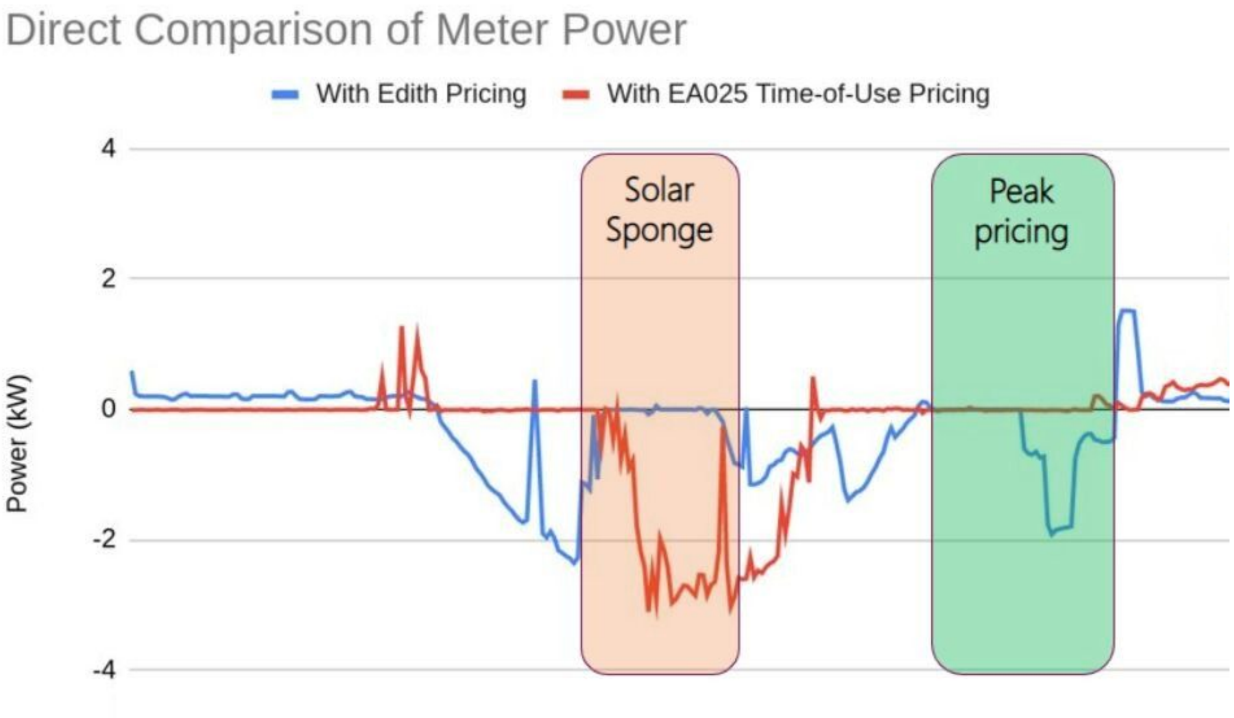
Reposit Power suggests that consideration be given to the expansion of BESS2 or addition of an additional BESS category, to reflect exposure of BESS to innovative forms of incentive which drive peak demand reduction when it is required. In particular, Reposit has observed behaviour aligning to peak demand reduction through exposure to Dynamic Network Prices (DNPs) in Project Edith. Project Edith DNPs offer a secure way to incentivise BESS response to high demand periods. The DNP calculation method considers temperature and weather forecasting to anticipate times of high demand and offer incentives to DER to respond accordingly. This delivers the greatest peak demand reduction when it is needed most, without incentivising exports from BESS when they are not needed (such as on a cool spring day where minimum demand is of greater concern).

For example, the below graph is from a Reposit controlled solar and battery system over two very similar clear sunny days. Both lines show power flowing across the connection point (positive numbers being import from the grid, negative numbers being export to the grid). The red line shows the system behaviour when exposed to the AusGrid EA025

Time-Of-Use network tariff. The blue line, on the other hand, is a Dynamic Network Tariff fed to the system under project Edith. This tariff included exposing the system to a very small negative export price in middle of the day, and an attractive export price during the peak demand evening period.

The contrast in behaviour of the system under both scenarios is striking. When exposed to the EA025 tariff, the battery charged from the solar early, spilled excess generation when it got full, then discharged to meet demand during the evening peak. It is clear under this arrangement, the battery had a zero marginal benefit in reducing peak solar exports in the middle of the day.

When exposed to the Dynamic Network Price, however, the system chose to keep the battery empty throughout the early part of the morning, instead exporting the solar. As soon as the negative price period hits, the battery then starts to charge from the solar, eliminating that middle of the day peak export, with a small amount of spill to the grid in the afternoon. Then, come the evening peak, the battery first services the household load, and toward the end of the period calculates it will have some excess energy in the battery and chooses to export that excess back the grid, with the battery empty by the end of the evening peak.



Under the proposed BESS2 regime, the creation of certificates under the scheme may have little or no impact on ongoing reduction to peak exports from solar and battery systems. However, having the creation of certificates be linked to a dynamic network price will ensure more certificates are generated for those systems that have a direct and measurable reduction in the peak export period.

Proposed Calculation & Delivery Approaches

Two approaches are proposed at a high level, but these are not exhaustive:

1. Annual certificates for participation: the Capacity Holder is awarded certificates annually, in return to exposing their BESS to DNPs, as a function of the average peak reduction delivered by a BESS exposed to these DNPs.
2. DSO-generated certificates: leveraging price elasticity & DER responsiveness modeling, a calculation method could be established to award certificates based on the DNP set and the peak reduction expected. Capacity Holders would assign the right to certificates generated to the DSO, and the DSO could in turn augment the DNPs themselves with certificate values, driving response.

While Reposit Power's expertise lies in solar & BESS, the incorporation of DNPs could also foreseeably be extended to other device types included in the PDRS, when they are exposed and respond to DNPs.

Conclusion

Expanding the PDRS to incorporate more consistent incentive signalling to BESS systems will deliver great peak demand reduction, while passing greater value back to those investing in BESS, when they choose to actively engage with network and energy market needs.

Reposit Power looks forward to seeing the upcoming rule change allowing BESS participation in the PDRS, and hopes that further evolution of the scheme will contribute to ongoing innovation and progress in the DER space.

Yours sincerely,

Marlon Leicester
Operations Engineer
On behalf of Reposit Power