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Energy Policy WA
Level 1, 66 St Georges Terrace
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Submitted online

Dear Energy Policy WA

Submission to Reserve Capacity Mechanism Review – Stage 1

EnerCloud Consulting (EnerCloud) welcomes the opportunity to make a submission to Energy Policy WA's consultation paper on the Reserve Capacity Mechanism Review published on 29 August 2022.

The commentary in this submission seeks to provide input to the following

the following

Consideration of longer duration stress events

The consultation paper notes that there is increasing volatility in load and the nature of the generation fleet is changing (i.e. becoming more variable and energy limited). The Reserve Capacity Mechanism (RCM) is intended to ensure that in real-time dispatch, "*a fleet of capacity resources is available to be dispatched to meet demand when needed*". To achieve this, the proposed conceptual design is to retain a traditional "peak capacity" product and introduce a new flexible ramping product.

However, capacity and flexibility products may not sufficiently cover the full range of potential stress events that are as much about energy availability as they are about capacity. As Frank Wolak points out in a recent working paper[1], "*the primary reliability challenge is not adequate generation capacity to serve demand peaks, but adequate energy available to serve realized demand during all hours of the year*". The recent coal supply issue in the Collie sub-basin is a timely illustration of this – there may be sufficient generation capacity from Bluewaters, Collie and Muja to serve peak demand (and meet the 14-hour fuel availability requirements to be classified as firm), but fuel supply constraints may limit the amount of energy that the power stations can generate over a period of days and weeks.

The modelling presented in the consultation paper was intended to "*quantify system stress due to:*

> *Maximum demand, including extreme peaks;*
> *Minimum demand, including extreme lows;*
> *Demand variation, including the speed and magnitude of the change; and*
> *Generation volatility, including the impact of rapid changes in output from intermittent generation"*

But what appears to be missing from this analysis is consideration of longer duration and correlated stress events when the RCM is arguably most necessary, such as multi-day heatwaves or cold snaps, wind, and solar droughts ("Dunkelflaute" effects) and infrastructure bottlenecks (e.g. problems on the Dampier-to-Bunbury pipeline or Collie sub-basin coal mines). Accounting for such stress events would incentivise a more diverse and resilient capacity mix. Experience with the existing RCM design suggests that despite having ample certified capacity (4,985.551 MW of certified capacity against a requirement of 4,482 MW[2]), the system is still vulnerable during long duration stress events like the heatwave over the 2021 Christmas period.

The proposed conceptual design introduces the concept of "capability classes" (firm capacity, restricted firm capacity and non-firm capacity) to address the energy availability issue. However, this may not feasibly cater for longer duration stress events. A greater focus not just on peak demand and ramping, but also on energy availability at all times is recommended, particularly for longer duration stress events. This will likely incentivise desirable investments and responses from the market, e.g. medium-to-long duration energy storage, behind-the-meter firming of variable renewable energy, more flexible demand-side response, etc.

Role of unit commitment in resource adequacy modelling

In a power system with a high penetration of variable renewable energy, a key source of system stress is wide-area (correlated) weather volatility. This could emanate from DER (described as demand volatility in Figure 1 of the consultation paper) or large-scale wind and solar (described as generation volatility in Figure 1). When assessing the ability of the dispatchable capacity available to handle such events, the models must take into account the commitment of inflexible plant, e.g. coal-fired and combined-cycle generators that may take hours to start up and synchronise to the system. For example, there may be adequate available capacity in the system, but if demand or generation volatility occurs over a short timeframe and the available dispatchable capacity is inflexible and offline, then these units cannot be counted on to provide capacity when it is needed.

Until such time as the >2 GW of inflexible capacity in the WEM is retired (e.g. Bluewaters, Cockburn, Collie, Muja and Newgen Kwinana), it is important that any RCM modelling captures the unit commitment of these power stations. CAPSIM does not account for unit commitment as it is not a chronological model, and it is also unclear that the unit commitment functions in WEMSIM have been enabled in the RCM modelling (since no unit commitment parameters such as startup times, minimum generation levels, etc. have been presented).

Without capturing inter-temporal dynamics and the potential reduction in available capacity due to decommitted inflexible plant, the modelling risks being overly optimistic during volatile low or medium demand days, where there otherwise appears to be sufficient available capacity.