Total Environment Centre

Submission to Energy Security Board

Response to P2025 Market Design Consultation Paper

October 2020

TEC welcomes the opportunity to make a submission to this important process. In view of our limited resources and multiple commitments we have chosen to focus on one critical dimension of the emerging energy landscape which is missing from the P2025 process to date: resilience.

We are also aware that the ESB is currently engaged in intensive design work around the various P2025 workstreams, so the consultation paper may have been largely superseded by the time submissions are considered. TEC has recently been heavily involved in the two sided market (2SM) and DER integration workstream consumer consultations and considers those ongoing dynamic discussions to be potentially more productive than static submissions.

The NER do not explicitly recognise resilience, which is distinct from reliability. Put simply, reliability is one measure of resilience, but resilience is a much broader concept, relating to *the capacity for electricity systems to prepare, absorb and recover from natural hazard events*.[1] A more technical distinction related to the NER is that reliability refers to short-term (up to 12 hours) and localised outages whereas resilience released can relate to outages lasting for days or weeks over any area.

As well as accelerating climate change impacts (the focus of this short submission), other categories of resilience include cyberattacks and "black swan" events like the coronavirus that come out of nowhere and potentially wreak havoc on business as usual.

The need to increase energy system resilience in the face of climate change has been recognised to date primarily in two NEM processes: the AEMC's review of the 2016 SA black system event, and the AER's VCR review. The former essentially treated DER (in the form of uncontrolled DPV) as a threat to system security, while the latter failed to decide on a methodology for widespread and long duration outages (WALDOs). So we regard resilience as essentially still a missing piece of the future system puzzle.

The consultation paper only refers to climate change in the context of changing generation investment — that is, long-term mitigation options, rather than the potential impacts of more frequent and intense severe weather events, especially bushfires, cyclones/storms and heatwaves. It makes only two references to energy system resilience, both in the context of threats to system security related to increasing VRE. There appears to be no recognition of the increasing unreliability of old coal power plants in the context of higher summer maximum temperatures, let alone the need to design the future system to better respond to extreme weather events.

A more comprehensive approach to the issue would include a working definition of resilience, examples of how it has become a major problem (such as the increasing cost to all consumers of pass through applications — eg, after the 2019-20 bushfires), options for improving system

[1] Bushfire and Natural Hazards CRC, The Australian Natural Disaster Resilience Index: A system for assessing the resilience of Australian communities to natural hazards, Chapter 1, July 2020.

resilience including DER, International comparisons, and a cost benefit analysis of the choices identified.

Should the ESB decide to turn its attention to resilience, please note the following:

- TEC and Renew published a discussion paper on the role of DER in increasing system resilience in 2019.
- We were recently involved in a study undertaken by CutlerMerz and funded by ENA and ARENA on the opportunities for SAPS and microgrids to enhance network resilience.
- We intend to submit a rule change request in the first half of 2021 to explicitly include consideration of resilience within the NER by encouraging or requiring networks to climate change impacts on their planning and investments (see appendix).

TEC is particularly focused on the opportunities for DER to contribute to greater system resilience, which is justified by projections that DER could contribute AEMO projects that DER could provide up to 22% of total underlying annual NEM energy consumption by 2040,[2] and potentially saving about $16 billion of network investment by 2050.[3] This contribution could take the form of increased investment in SAPS, microgrids, islandable PV and battery systems, community batteries, EVs with V2G capability, small consumer demand response and the undergrounding of more suburban lines as alternatives to rebuilding poles, wires and substations like for like after major damaging outages.

Recognising the role of DER in increasing energy system resilience depends on two things. One is better climate data and a fit for purpose risk assessment framework. These should come out of the Electricity Sector Climate Information (ESCI) project being undertaken by CSIRO and AEMO with the Bureau of Meteorology (BOM). This will enable networks to identify the assets under threat from extreme weather events.

The other element is regulatory reform. Despite resilience having become an industry buzzword over the past year or so, there is currently no recognition of it in the NER. The AER recently attempted to develop a metric for widespread and long duration outages (WALDOs) but it was unsuccessful. Many impacts of severe weather events like bushfires and cyclones do not affect widespread areas, so would have been excluded in any case. But the fundamental idea of applying VCRs to WALDOs is sound, even if calculating social costs is problematic.

What is needed above all is a mechanism to incentivise distribution networks to invest in assets and services which increase the resilience of the energy system to the benefit of consumers. At present no such incentive exists; in fact, there are disincentives to investing in resilience (eg, by rewarding networks for underspending on capex and opex).

As well as increasing overall system resilience, regulatory reform should lead to lower costs to consumers in the medium to long term, for two reasons. One, distribution networks will invest in assets and services which are less likely to be damaged by severe weather events and require repeated rebuilding. And two, if (as appears likely), resilience services are more cheaply obtained from DER than from centralised assets, this is likely to stimulate long-term shift away from replacing transmission level poles, wires and substations with like for like assets at the end of their lifespans.

[2] AEMO, 2020 Integrated System Plan, 41.

[3] CSIRO & Energy Networks Australia (2017) *Electricity Network Transformation Roadmap, Final Report*, p.43.

It's not that the overall grid will shrink substantially, but that more of the spending on new and replacement assets will be to support the increasing range of actions consumers can take locally to generate, store and trade our renewable energy. In a reversal of the old energy paradigm, the centralised system may eventually be there mostly as a source of backup supply.

Should this rule change request be successful, the most likely impact on the system will be to incentivise network and private investment in a range of climate-resilient DER, further tilting the balance of bulk supply versus DER investment towards the latter. This will have a measurable impact on the Resource adequacy mechanisms and Transmission access workstreams, because any independent CBA undertaken to determine the optimum balance of investment to improve system resilience is likely to recommend less investment in large scale generation and transmission vis-à-vis DER (including offgrid resources).

There are likely to be other impacts on the P2025 workstreams. For instance, the 2SM workstream should be cognisant of the potential emergence of a new market for resilience services. The Transmission access workstream should consider the potential derating or decommissioning of transmission assets if DER prove to offer consumers superior resilience. And so on: the ESB should run a system resilience lens over the entire P2025 work program (hopefully free of the market bodies' traditional bias towards bulk supply solutions) in an attempt to answer the following two fundamental questions:

1. How should the energy system internalise the increasing risk to resilience from climate change impacts, cyberattacks and other potential threats?
2. What is the optimum mix of bulk supply and DER investments to maximise system resilience?

Should the ESB continue to ignore climate change resilience, the outcomes are likely to include inefficient investment, higher energy prices, more frequent outages, and a grid which does not support emergency responses.

Given that the ESB's remit for the P2025 project is to "advise on a long-term, fit-for-purpose market design for the NEM", in the context of accelerating climate change impacts the absence of a focus on resilience is a serious deficiency. We sincerely hope that this lacuna can be overcome in the time available, and are happy to help.

Yours sincerely,

Jeff Angel

Director

Appendix - Impending resilience rule change request

Objective: To incentivise distribution networks to invest in assets and services which increase the resilience of the energy system to the benefit of consumers.

The text below is from CutlerMerz, Opportunities for SAPS to enhance network resilience, October 2020.[4]

The rule change related to resilience will require, inter alia, an explanation of the distinction between resilience and reliability, and the relevance of resilience to the NEO particularly in respect of price and a he rule change itself is likely to include the following elements:

- A definition of resilience: we recommend that adopted by the Australian Natural Disaster Resilience Index.
- A requirement for the AER to create a resilience guideline including:
    - A risk assessment framework: we expect that this will be forthcoming in 2021 from the ESCI project. This will include probabilistic treatment of individual severe weather events, and potentially an alternative approach for compound severe weather events.
    - Changes to the AER's VCR/WALDO framework to recognise the costs of long duration but localised outages, potentially including social costs based on recent Australian data.
    - Changes to the STPIS Beta 2.5 methodology to reflect the increasing number and severity of major event days (MEDs).
    - Changes to chapter 6 related to forecast capex and opex to require DNSPs to "maintain the reliability, security and resilience of the distribution system through the supply of standard control services" (6.5.7(a)(3)(iv)).
    - Changes to broaden the considerations that a DNSP is able to consider in determining whether to transition existing customers to a SAPS to include improved resilience.
    - Consideration of the impact of a resilience requirement on other incentives (e.g. the CESS and EBSS).
    - Consideration of any impacts on jurisdictional reliability standards.
- A cost benefit analysis showing the benefit to consumers (e.g. an estimate of the likely long-term savings across the NEM from transitioning isolated rural properties onto SAPS and isolated rural towns onto microgrids for one or two climate change scenarios).

[4] Unpublished at the time this submission was lodged.