Ben Hiron

Australian Energy Market Commission

Submission made online at www.aemc.gov.au

28 August 2026

Dear Mr Hiron,

Subject: ERC0439 Consultation Paper – Minimum system load governance and market arrangements

SA Power Networks welcomes the opportunity to comment on the AEMC's Consultation Paper on *Minimum system load governance and market arrangements*, following rule change requests from the Reliability Panel and the Clean Energy Council (CEC).

Our key points of feedback are as follows, and are further expanded throughout the submission:

1. We support the Reliability Panel's proposal to formalise the MSL governance framework within the National Electricity Rules (NER), aligned to the existing lack of reserve (LOR) framework. AEMO should be required to develop MSL forecasting procedures and management guidelines, noting that these may be subject to regular change as MSL issues evolve.
2. MSL conditions are best managed through price signals in the existing spot market. However, natural market operations may at times be insufficient to manage MSL risks. A three-tiered approach should thus be taken to managing MSL risk:
    a. utilise price signals within the current market; before
    b. intervening in that market, and if risks still persist;
    c. only then introducing new market services as a last resort.
3. As such, we support the Reliability Panel's proposal to force spot price to the market floor price (MFP) during actual MSL3 conditions but would not support the CEC's proposal to introduce a new MSL ancillary service at this time. The CEC's proposal should instead be revisited at such a time as more foundational reforms to manage MSL risks have been implemented and their efficacy demonstrated.
4. The most efficient way to manage MSL risks is at the source – by making rooftop PV price-responsive. The AEMC should support DNSPs in providing price-based rooftop PV curtailment to retailers as a free service, accelerating the deployment of price-responsive rooftop PV.

We look forward to continuing to engage with the AEMC to deliver the lowest cost whole-of-system approach to enabling the energy transition. Should you have questions on any aspect of our submission, please contact Liam Mallamo, Industry Development Lead, at liam.mallamo@sapowernetworks.com.au.

Ben Birch

Head of Strategy, Innovation and Growth

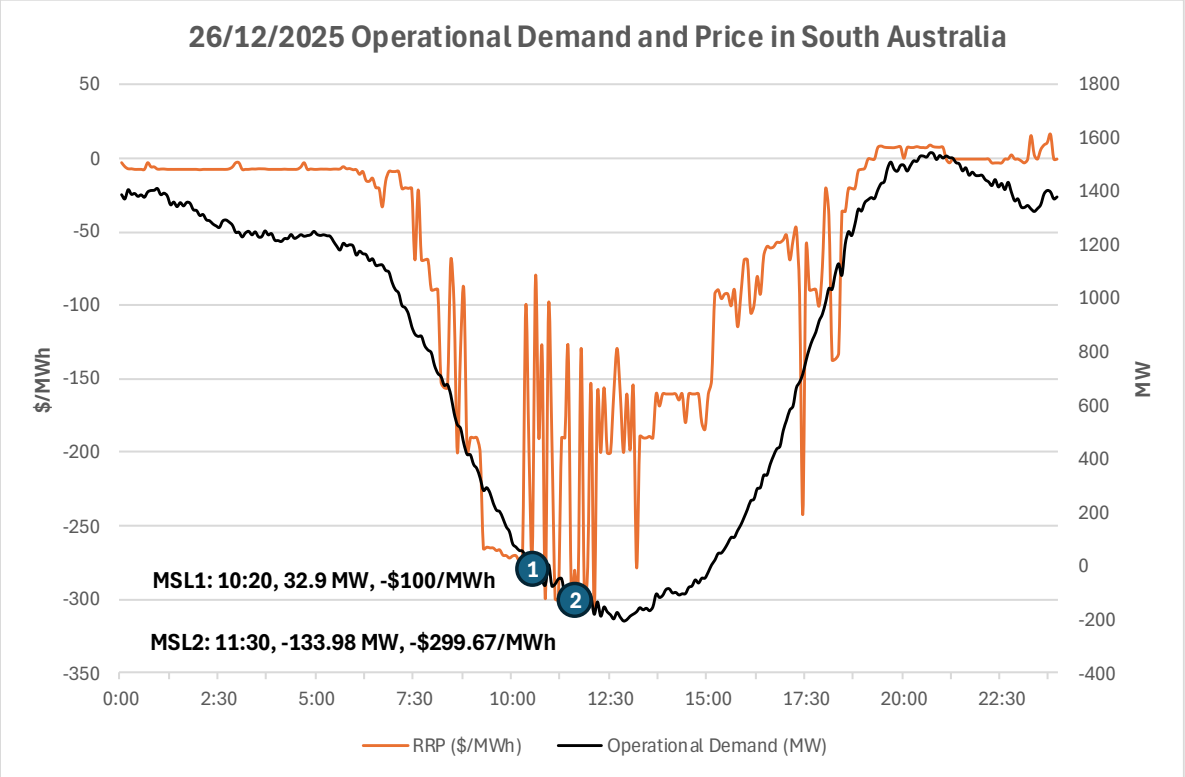
South Australia presents a window into the future of MSL risk

MSL is becoming an increasing challenge across the NEM, with South Australia (SA) at the forefront of both facing and managing these risks. Rooftop PV acts as the single largest generator in the state, and its uptake in SA continues to significantly outpace load-side growth. This is leading to continued instances of record low operational demand and is threatening AEMO's ability to maintain a secure and stable power system. Negative operational demand is becoming increasingly common, and the magnitude of that negative demand continues to grow. SA thus poses a view into a potential future of the NEM.

How does the market respond to MSL events in SA today?

SA most recently experienced actual MSL1 and MSL2 conditions on the 26th of December 2025, with MSL1 occurring at an operational demand threshold of 34MW and MSL2 at -117MW. The chart below shows the behaviour of operational demand and spot price in the region during these conditions[1].

Low operational demand drove spot prices negative – but still significantly above the MFP.



Nonetheless, this price reduction was sufficient to drive price-based curtailment of most scheduled generation in the region. By the time MSL1 was declared, all utility-scale solar had completely self-curtailed and utility-scale wind was ramping down. At MSL2, remaining utility-scale wind had followed suit, aside from a single set of wind farms operating under legacy PPAs, and gas was curtailed down to the minimum operating level of the plant. Rooftop PV, meanwhile, continued to dominate the generation mix and increase without constraint. The below table provides a breakdown of the generation mix during these intervals[2].

[1] Based on SA Power Networks analysis of AEMO data.
[2] Ibid.

Market interval	Estimated rooftop PV output	Dispatched generation
10:30 AM (MSL1)	1925 MW	**Gas:** 82MW (minimum operating level)
		Wind: 217 MW (largely driven by legacy PPAs)
		Batteries: -111 MW
11:30 AM (MSL2)	2191 MW	**Gas:** 82MW (minimum operating level)
		Wind: 169 MW (entirely driven by legacy PPAs)
		Batteries: -70 MW

Whilst MSL3 conditions did not occur on this day, it nonetheless presents a useful case study to explore the impacts of potential reforms - *how would the Reliability Panel's proposal to force the spot market price to the MFP have impacted the generation mix and MSL risks on this day?*

Even if the spot price had reached the MFP, there was simply no remaining generation to curtail by the time MSL2 was reached. In this case, the 'muted' price reached by the market had been sufficient to curtail all spot price-exposed generation. However – there was still room for batteries to charge. SA's 1.3 GWh battery fleet held only 342 MWh of charge at 10:00 AM – with batteries clearly reserving capacity for FCAS or for potential lower price events later in the day.

Had the market provided sufficient incentive for batteries to focus purely on spot price, an additional 400MW of load could potentially have been consistently dispatched over the period from 10:00 AM to 12:00 PM, increasing operational demand to a safe level and preventing MSL conditions. We consider this to be a clear example of where the Reliability Panel's MFP trigger proposal would genuinely pose an efficient solution to managing MSL risk.

The Reliability Panel's MFP trigger is only part of the solution

Whilst incentivising battery charging by forcing the market to clear at the MFP would have resolved any potential MSL risk, it also would have incurred significant costs on energy retailers, and hence consumers, who would be paying $1000/MWh for the more than 4 GWh of exports from rooftop PV over this 2-hour period, as well as direct feed-in-tariff payments to those customers. These costs act to drive up retail prices for consumers in the long run, and should act as a strong incentive for energy retailers to hedge their risk against negative pricing by developing capabilities to curtail exports from their customers rooftop PV.

If energy retailers had this capacity and even a small portion of SA's rooftop PV fleet been able to respond to market price on this day, it is highly likely that neither the MSL1 nor MSL2 thresholds would have been reached. As such, whilst we support the Reliability Panels proposed MFP trigger, we consider that it is only one piece of the solution to the MSL puzzle. A strong price incentive is most useful when all resources can respond to it – including the largest generator in the NEM, rooftop PV.

Why is rooftop PV not price-responsive today?

Rooftop PV is not price-responsive at any meaningful scale today, despite clear financial incentives for energy retailers and reductions in system security risk. Despite these clear benefits, enabling price-responsive rooftop PV at scale is hindered by two key factors, namely:

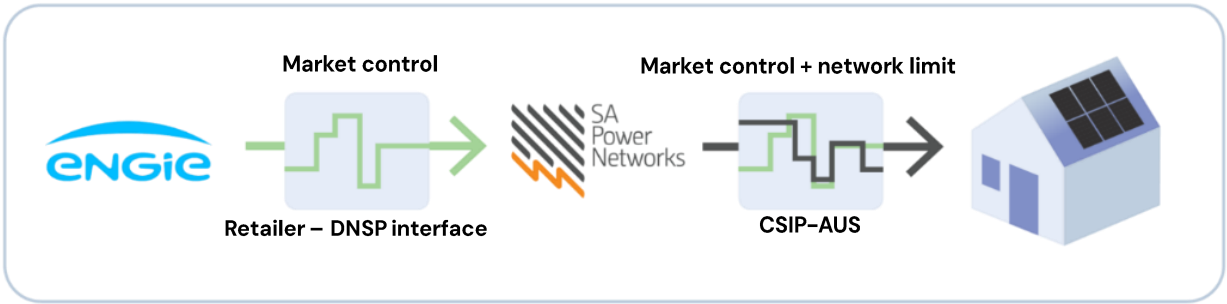
- No single, standardised pathway for energy retailers to communicate with customers' rooftop PV systems. As a result, retailers seeking to send curtailment signals must undertake bespoke integrations across hundreds of rooftop PV inverter makes and models, using a range of original equipment manufacturer (OEM) communication interfaces.
    - Such integrations can regularly come at a cost of $50,000 or more per inverter model[3] and can take months to develop and test.
    - OEMs often maintain dedicated commercial relationships with energy retailers or aggregators, meaning that even where a retailer wishes to establish an integration with an OEM, the OEM may not be willing to commercially negotiate with that retailer due to being 'locked in' to a sole-source arrangement with another retailer.
- Once an integration has been established with a given inverter model, the use of that integration to communicate with a rooftop PV system is subject to ongoing access fees charged by the OEM.

These barriers mean that in practice, there is currently no scalable pathway for enabling price-responsive rooftop PV, despite clear incentives for energy retailers in doing so. The cost and effort of performing hundreds of bespoke integrations to the ever-changing set of rooftop PV inverter makes and models on the market simply imposes too high a barrier.

DNSP capabilities can be leveraged to provide an efficient path to enabling price-responsive rooftop PV

SA Power Networks, in conjunction with energy retailers AGL and Engie, sought to address these barriers through an ARENA-funded trial beginning in 2022, *Market Active Solar*[4] . In this trial, energy retailers were given access to SA Power Networks' CSIP-AUS communications infrastructure, through which they could curtail exports from more than 95% of modern rooftop PV systems in SA during negative price events. Customers were compensated commensurate with the market risk avoided by the retailer and the lost feed-in-tariff revenue they otherwise would have received.

The approach taken by Engie in the trial saw the retailer sending a market control to the DNSP over a simple interface, with the DNSP then merging that signal with a DOE and sending the merged signal to the rooftop PV system via CSIP-AUS. In this model, DNSP systems act simply as a passthrough for the market control**.**



By leveraging SA Power Networks' interoperable CSIP-AUS pathway, Engie was able to access rooftop PV systems across nearly 100 OEMs, namely any CER device that had been tested and certified to CSIP-AUS. This approach provided the equivalent market access of Engie performing 47 bespoke integrations at an approximate cost of $50,000 each, or a total cost of approximately $2,400,000. To access this

[3] CSIP-AUS: A Retailer Perspective, Engie, October 2025
[4] Market Active Solar Trial, ARENA, October 2023

pathway, Engie was required to perform a single integration to a simple API developed by SA Power Networks, achieved at a total cost of approximately $50,000. Importantly, this model can be easily scaled to include controls beyond just PV curtailment – allowing for a full suite of market controls to be passed through, enabling a lowest-cost path to orchestrating all consumer energy resources (CER).

The Market Active Solar trial demonstrated the technical and financial feasibility of this model – but further work and reforms are needed to scale this approach nationally.

Price-responsive PV should be made available through DNSP systems at no direct cost to energy retailers

Under the current network service classification framework, sharing DNSP systems with energy retailers to enable price-responsive rooftop PV is an unregulated distribution service (UDS). This leads to a user-pays approach to cost recovery, where the costs of providing the service are recovered directly from retailers using it. However, we consider that if it was considered as part of a regulated service, greater consumer benefits would be realised. By recovering the costs of enabling this platform from all consumers, DNSPs would be able to offer an orchestration platform to energy retailers free of charge – fundamentally removing a key commercial barrier to orchestration and massively accelerating its uptake. Offering access to orchestration as a free service would unlock universal access for all retailers, regardless of size, and hence to all consumers, regardless of what rooftop PV system or other CER they have.

Critically, this would not be a monopoly service. By no means would the shared platform be the only option for communicating to CER – rather, it would simply be an entry point, a way to establish a baseline, universal capability to send market controls to CER that any retailer could access. Bespoke approaches would still be necessary and beneficial for more advanced orchestration, allowing the market to focus its innovation efforts on genuinely new products and offers. The true consumer value of competition in orchestration is in product design, and not in locking products behind device integration barriers.

MSL risks are most effectively addressed at the source

MSL is today largely addressed *reactively* – with solutions enacted once an MSL condition has already been forecast or reached. The proposals from both the Reliability Panel and the CEC largely seek to expand the suite of such reactive solutions available to the market. We consider, however, that the most efficient way to address MSL risks is via a *proactive* approach – seeking to prevent even an MSL1 condition from eventuating by tackling the root cause of the MSL challenge, namely that rooftop PV does not respond to market price.

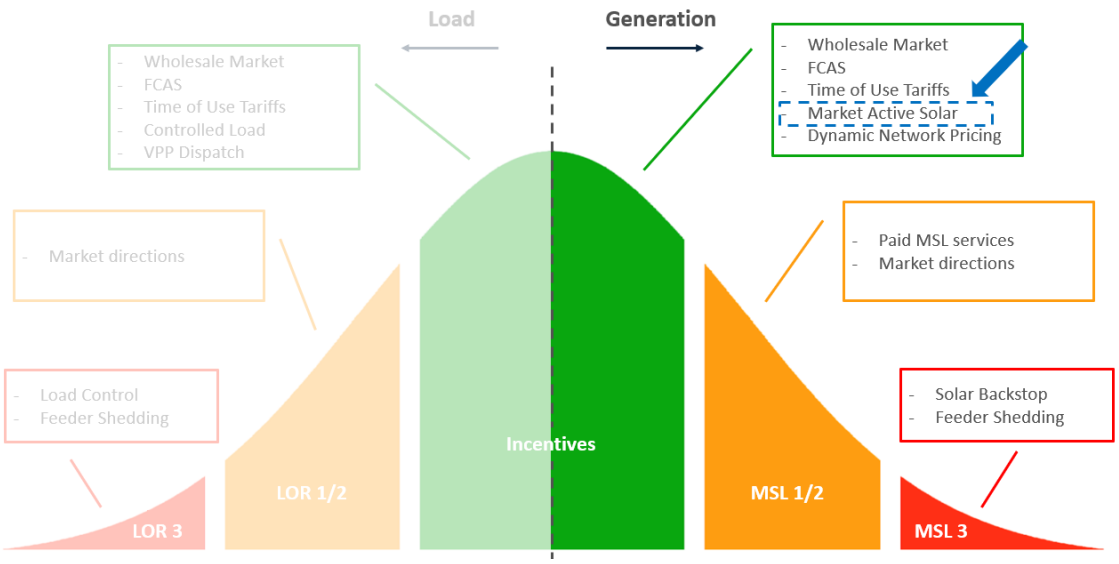
However, this would not represent a 'silver bullet' to managing MSL. Price-responsive rooftop PV would simply be an additional tool in AEMO's MSL toolkit, one that complements both existing and future market and system services.

Price-responsive PV would complement the Reliability Panel's MFP trigger proposal

Our approach seeks to largely eliminate MSL risk, but would both take time to scale and may see some limitations in its adoption, due to the need for retail engagement of end customers. As such, other solutions would still be required to ensure the security of the power system in future. These would include the Reliability Panel's proposed MFP trigger and the use of emergency backstop in MSL3 conditions, or the suite of novel approaches AEMO is exploring through Type 2 services. Ensuring that efforts have *first* been made to achieve price-responsive rooftop PV, however, would likely significantly

reduce the frequency at which these other solutions would be required, and in-turn reduce the costs incurred of deploying them.

Importantly, price-responsive rooftop PV would be a *complement* to the Reliability Panel's proposed MFP trigger. Forcing the market to clear at the MFP during MSL3 events would fast-track retail adoption of price-responsive rooftop PV, in-turn providing even more price-responsive generation during future MSL events.



Should the price-response of rooftop PV not fully align with MSL conditions, AEMO would be able to 'move further along the curve' and implement a more interventionist MSL response, whether that be market directions, emergency backstop or future services such as that proposed by the CEC.

Price-responsive rooftop PV would complement AEMO's Market Visibility Framework

AEMO has been tasked with developing a *Market Visibility Framework* (MVF), building on Recommendation 2A of the *NEM Wholesale Market Settings Review*. The MVF will explore options for currently unscheduled price-responsive resources to be visible to AEMO and better included in operational forecasting, or to be included in market dispatch and price formation.

Establishing a scaled approach to CER orchestration through DNSP systems would immediately provide visibility over these resources to DNSPs, and in-turn AEMO. Additionally, it would significantly lower the total barriers faced in fully integrating CER into the market as a scheduled resource. With rooftop PV and other CER not only price-responsive, but also scheduled, AEMO's control over the largest resource in the NEM would significantly improve, and in-turn further reduce MSL and other system security risks.