NEM Spring Readiness

Industry Briefing

20 August 2025

We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country, and hope that our work can benefit both people and Country.

'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have launched its first Reconciliation Action Plan in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation – a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Read our RAP

Agenda

1. Introduction by Michael Gatt, EGM Operations
2. Spring outlook
3. Minimum system load update
   a. Regional thresholds
   b. MSL day example
   c. Helpful market participant actions
4. Forecast MSL conditions
5. Q&A

Spring outlook

Improved
Similar or unchanged
Potential to get worse

Impact	West/East	Comparison to an average spring season
Unusually warm		Warmer than average days are very likely for far northern, tropical parts, of the country and most southern parts of the country, including parts of South Australia, Victoria and Tasmania. Warmer than average nights are very likely for central and eastern parts of the country and slightly reduced likelihood for WA.
Widespread flooding		ENSO outlook is currently neutral. Rainfall is likely to be above average for most of mainland Australia. Average rainfall is expected for large parts of WA. Below average rainfall is forecast for southwestern WA, northern WA and western Tasmania.
Bushfire risk		Most southern parts of the continent (parts of southern WA, SA, Victoria and Tasmania) with seasonally low rainfall and soil moisture may see increased fire risk during spring and leading into summer. Spring fire outlook is typically published next week.
Record minimum demand		Increased likelihood of new record minimum demands in the NEM and WEM. Increased likelihood of forecast Minimum System Load (MSL) conditions, particularly in South Australia, Victoria and Queensland regions, presenting operational challenges. Operational procedures are being updated. There is low / very low likelihood of forecast MSL conditions in NSW. There is also very low likelihood of Minimum Demand Threshold (MDT) conditions in WA.
Generation and storage availability		On average, synchronous generation availability is expected to be higher in NSW, similar in SA and Tasmania but reduced in Queensland and Victoria compared to last season. There is additional BESS capacity in all NEM regions except for Tasmania. In the WEM, additional BESS capacity (approximately 800 MW) is available compared to last season with further 500 MW undergoing commissioning during spring.
Network outages		Volume of planned High Impact Outages (HIOs) are forecast to be higher in Queensland and Victoria but similar in all other regions, compared to last spring season. Shoulder seasons typically result in higher levels of planned outage bookings due to favourable weather conditions and mild demands. Some outages have the potential to reduce regional export capability increasing MSL thresholds.
Reliability		Loss of load probability (LOLP) study is comparable to an average spring season. The study shows small number of days with low LOLP in New South Wales and Victoria regions. LOLP is negligible in other NEM regions. WEM supply demand balance is generally healthy due to addition of new BESS. There is low likelihood of record maximum demands in November in both WEM and NEM, however, reserve shortfalls could arise if higher demand periods coincide with unplanned generation outages or transmission limitations.
Fuel supply		Coal storage levels are at normal levels in the NEM and WEM. Iona gas storage is at similar level to the last spring season. Increased gas supply from Queensland may be required during maintenance of the Longford facility in November especially if combined with any unplanned generation or network events. Monitoring of storage refill rates is critical ahead of winter 2026. In the WEM there is an adequate gas supply for the season.
Health of markets		Prudential risks / extreme energy price risks are considered low in the NEM and WEM.

Notes: Spring is defined as the period from 1 September to 30 November. It should be noted that climate model accuracy improves closer to the start of the season. Information on scheduled generation availability and planned transmission outages are subject to change. Comparison to an “average” spring is based on the past 3 spring seasons.

Minimum System Load (MSL) update

- MSL framework is similar to the Lack of Reserve (LOR) framework.
- The LOR framework ensures there is sufficient supply to meet demand. The MSL framework ensures there is sufficient demand to support the minimum loading of units providing essential system services.
- AEMO provides MSL notices to the market and works with the industry to get a market response to manage conditions.
- MSL conditions are more likely to occur during spring/summer, due to mild temperatures and high solar irradiance. Days with lower demands such as weekends and public holidays increase the chance of MSL.

MSL1 – Regional demand is two credible load contingencies away from MSL3.

Market notice published for information.

MSL2 – Regional demand is one credible load contingency away from MSL3.

Take actions to land satisfactory following contingency and resecure in 30 mins.

MSL3 – Need to increase demand for system security.

Direct NSPs to maintain demand above threshold.

LOR v MSL Market Notice

	Notice type = RESERVE NOTICE	Notice type = MINIMUM SYSTEM LOAD
Definition	**LOR1** – Regional reserve is either the FUM or the two largest credible contingencies away from LOR3. Market notice published for information.	**MSL1** – Regional demand is two credible (including network elements) contingencies away from MSL3. Market notice published for information.
	LOR2 – Regional reserve is either the FUM or one credible contingency away from LOR3. Take actions to land satisfactory following contingency and resecure in 30 mins.	**MSL2** – Regional demand is one credible contingency away from MSL3. Take actions to land satisfactory following contingency and resecure in 30 mins.
	LOR3 – Need to reduce demand for system security. Direct load shedding.	**MSL3** – Need to increase demand for system security. Direct NSPs to maintain demand above threshold.
Update frequency	**PD timeframe** – review all LOR declarations every 30 minutes **ST timeframe** – review LOR1 declarations at 1400 hours daily, review LOR2 and/or LOR3 declarations every 60 minutes **Update market notice if:** • The LOR condition changes by the MW threshold specified in Table 4 (SO_OP_3703 - Short Term Reserve Management procedure), and/or • The LOR period has changed by two or more 30-minute periods.	**PD timeframe** – review every 30min and reasonable endeavours to update if: • The MSL condition changes by the MW threshold specified in Table 4 (SO_OP_3703 - Short Term Reserve Management procedure), and/or • The MSL period has changed by two or more 30-minute periods. **ST timeframe** – publish market notice twice daily at 1000 hours and 1500 hours if there are forecast MSL conditions.

*All times are provided in Market Time (AEST) https://www.aemo.com.au/subscribe (Minimum System Load Market Notices)

MSL Market Notices

122653 MINIMUM SYSTEM LOAD | 01/01/2025 09:43:04 AM

Forecast Minimum System Load MSL1 condition in the VIC Region on 01/01/2025

AEMO ELECTRICITY MARKET NOTICE
Forecast Minimum System Load MSL1 condition in the VIC Region on 01/01/2025

Update to Market Notice 122635
AEMO has detected that there is an elevated risk of insufficient demand to maintain a secure operating state in the VIC on 01/01/2025.

Minimum System Load (MSL) conditions are forecast when regional demand is less than the relevant MSL threshold. The advisory MSL thresholds are:
- MSL1 - 1560 MW
- MSL2 - 1060 MW
- MSL3 - 560 MW

The regional demand is forecast to be below the MSL1 threshold for the following period[s]:
- From 1200 hrs 01/01/2025 to 1400 hrs 01/01/2025. Minimum regional demand is forecast to be 1415 MW at 1300 hrs.

Forecast regional demand (DEMAND50) is published in Short Term and Pre-Dispatch PASA region solution reports available on Market Data NEMWEB: https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/data-nem/market-data-nemweb .

Manager NEM Real Time Operations

Region

Forecast or Actual

Provides thresholds

Time expected of the MSL condition

Where to find forecast demand

122654 MINIMUM SYSTEM LOAD | 01/01/2025 11:56:13 AM

Actual Minimum System Load MSL1 condition in the VIC Region on 01/01/2025

AEMO ELECTRICITY MARKET NOTICE
Actual Minimum System Load MSL1 condition in the VIC Region on 01/01/2025

Update to Market Notice 122653 - AEMO has detected that there is an elevated risk of insufficient demand to maintain a secure operating state in the VIC on 01/01/2025.

Minimum regional demand is forecast to be 1398 MW at 1300 hrs, and the advisory threshold is:
- MSL1 - 1535 MW
- MSL2 - 1035 MW
- MSL3 - 535 MW

The regional demand is below the MSL1 threshold. The actual MSL1 condition is forecast to exist until 1400 hrs.

Manager NEM Real Time Operations

MSL thresholds

- Actual thresholds are variable based on system conditions.
- Factors that can impact thresholds include:
  - aggregate minimum safe operating levels of units online,
  - scheduled pumps operation,
  - export capability of interconnectors,
  - network outages and
  - coincident demand in other NEM regions.

Procedure summary

Demand forecast < MSL2:
Publish market notice of forecast MSL2
Actions to clear MSL2 condition each taken at the latest time to intervene:

- Recall planned outages that reduce export capability
- Procure/direct re-secure reserves where applicable
- Direct pumps / Batteries
- Constraint Generation not required to maintain a Secure and Reliable state
  - Constrain significant non-scheduled generation 0 MW
  - Constrain semi-scheduled units to 0 MW
  - Scheduled generation units will get targets below MSOL*
  - Decommitment decision for scheduled units not required for Secure and Reliable operating state. If required, may direct to decommit
- Move to smaller unit combination

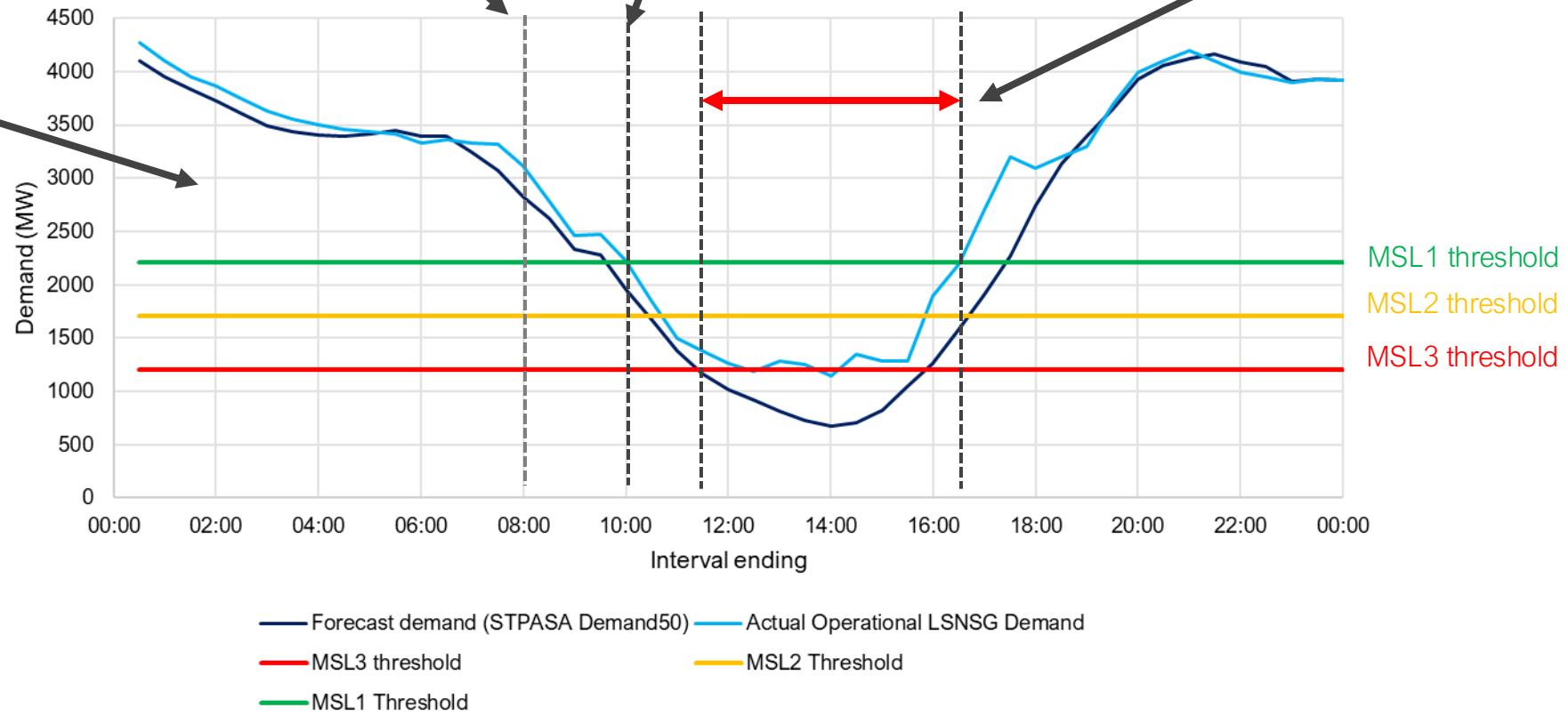
Demand forecast < MSL3:
Publish market notice of forecast MSL3
At latest time to intervene before MSL3 condition: Instruction to NSPs to maintain demand above MSL3 threshold.

MSL3 cancelled, all directions and notices cancelled

Demand < MSL3: NSP actions to maintain demand above MSL3 threshold

Demand forecast < MSL1:

- Market notice



*When targeted below their MSOL generators are expected rebid their ramp rate down to 0 MW, in accordance with the AER Rebidding and Technical Parameter Guidelines.

this chart is for illustrative purposes

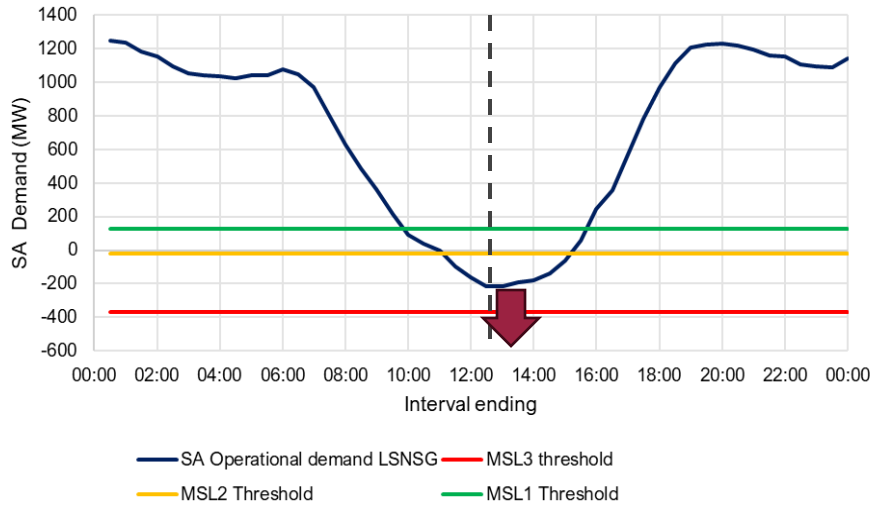
Synchronous units

From SO_OP_3705 section 9.4:

> In instances where a *scheduled generating unit* or *semi-scheduled generating unit* has reached its minimum safe operating level and cannot safely follow a *dispatch instruction* to vary its output downwards, it is appropriate for a zero down *ramp rate* to be provided to *AEMO*, as long as the zero *ramp rate* can be justified on the basis of a technical limitation.
>
> This approach should be used in preference to submitting an inflexible bid, as it provides greater flexibility to ensure the market remains in a *secure operating state*.

- As MSL periods approach:
  - NEMDE will give units dispatch targets below MSOL (Minimum Safe Operating Level)
  - Pre-Dispatch will not reflect likely outcomes
  - Refer to AEMO Guide SO_OP_3705 section 9.4
  - Making decommitment decisions early and reflecting in bids will help Pre-Dispatch better reflect likely outcomes
- If it is necessary to require non-essential units to decommit, they will be selected based on a balance of factors:
  - Relatively higher minimum operating level
  - Relatively lower Var absorption capability
  - Relatively shorter expected return to service time
- Longer term considerations:
  - If possible, reducing MSOL/Pmin in GPS will assist to delay and minimise MSL security issues
  - Continuing requirement to meet Generator Performance Standard (GPS) obligations, including:
    - Disturbance ride-through and stability
    - Unit flexibility
    - Reactive power and voltage management capabilities

Batteries



Resecure reserve

In an MSL2, following a credible contingency, demand could be below MSL3 levels.

Demand increase from the NSPs could take 90 mins for the full response, but AEMO still must resecure the power system in 30 mins and remain secure by ensuring there is enough load to get back above MSL3.

Batteries can provide this resecure service.

- For an MSL2 or MSL3, BESS are held at a pre-agreed minimum state of charge using constraints with a low violation penalty factor (3) that prevent them from being dispatched as a generator or load.
- These constraints are designed to violate in place of a security violation, making the battery charge, ensuring there is enough loading while backstop is being implemented.

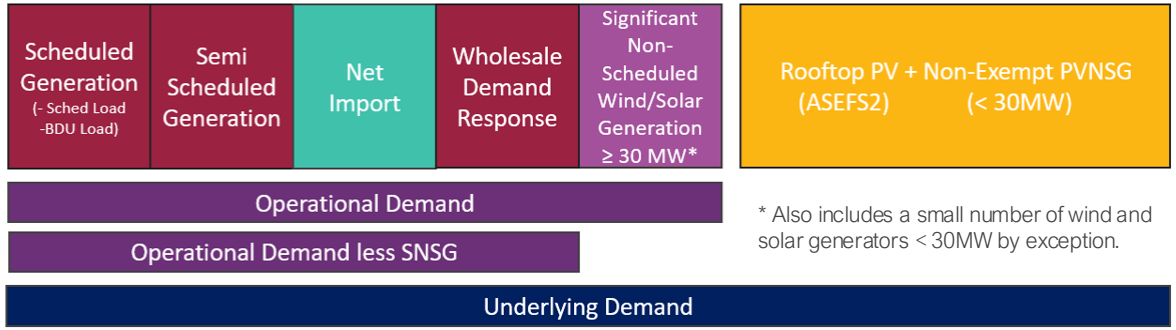
AEMO has been working on procuring this resecure service with participants for SA and VIC under the Transitional Services framework.

AEMO looks to procure this service in NSW and QLD for Spring 2026.

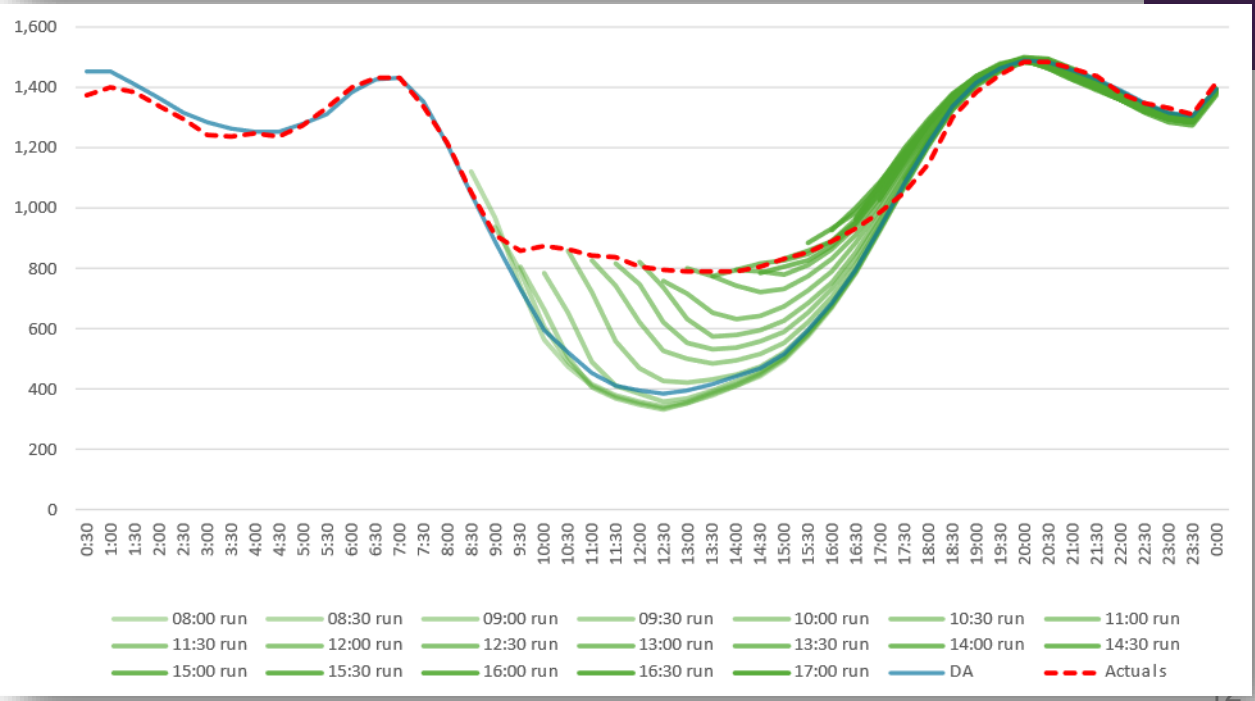
Where available, agreements will be used to ensure that enough resecure reserves are available to manage the MSL2/MSL3 risk. Otherwise, AEMO will use directions.

Demand forecast for MSL

- Operational Demand less Significant Non-Scheduled Generation is the demand used for MSL.
  - This demand definition is consistent with the forecast demand in the PD and ST PASA (DEMAND50 term).
  - Actual Operational Demand LSNSG can be found on the AEMO website.
- During an MSL3, forecast will not be biased and will continue to adjust
  - Closer to actuals in the near term then blend back out to the day ahead forecast, given adjustments to weather



Demand components. Net import can be negative (export).

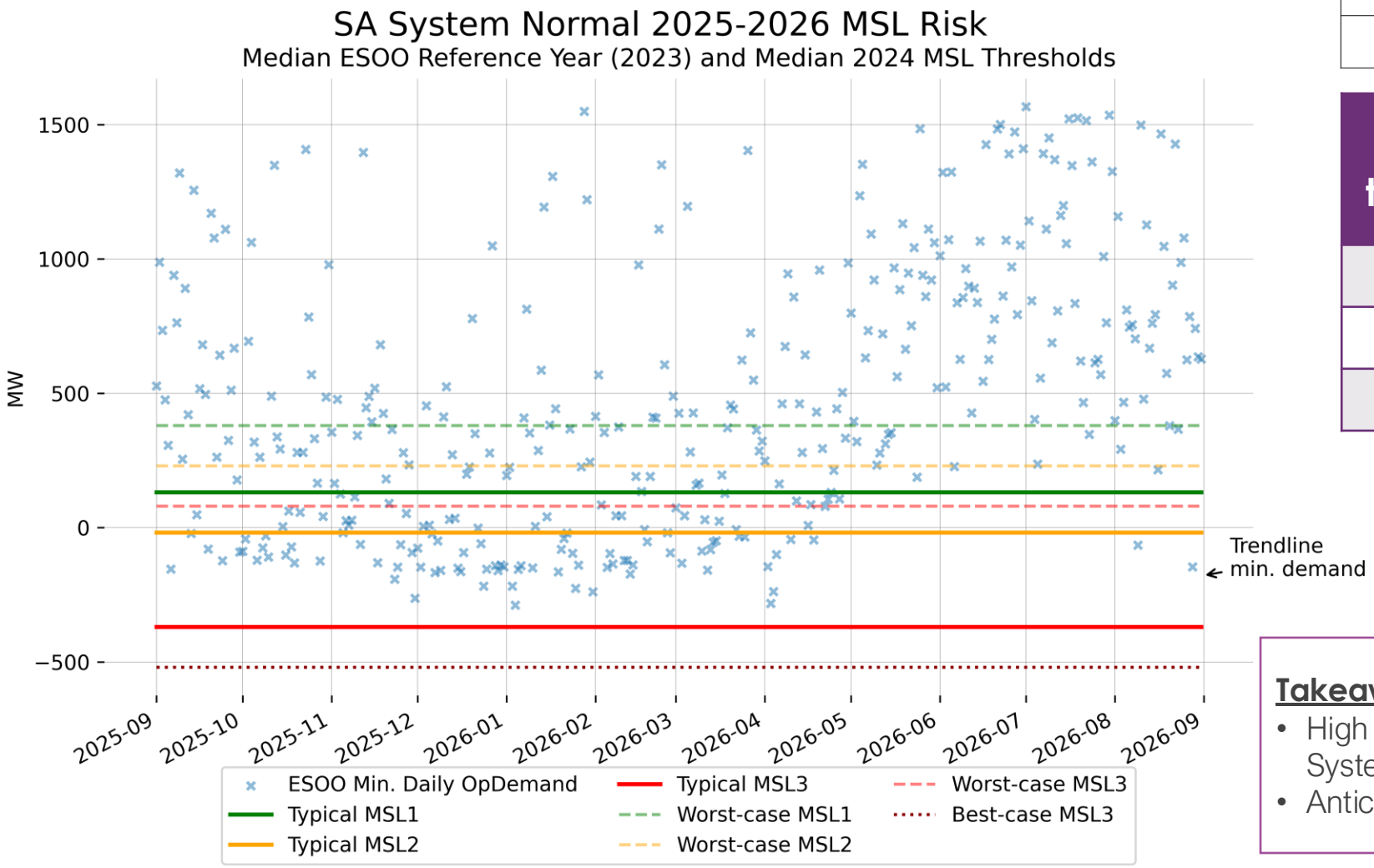


Summary: Spring 2025 Outlook

Region	Region condition	# of ESOO MSL1 days MN only	# of ESOO MSL2 days AEMO intervention	# of ESOO MSL3 days Emergency Backstop	Implications
SA	At-risk/Island	N/A No MSL1 Threshold	N/A No MSL2 Threshold	At-risk: 56-86 Island: 66-95	• If there is an unplanned outage, high probability of MSL • Anticipate MSL will impact planned outages that restrict SA export
	System Normal	9-27	39-64	0	• High MSL probability to be managed with a System Normal procedure • Anticipate MNs for MSL and AEMO intervention
QLD	At-risk/Island	N/A No MSL1 Threshold	N/A No MSL2 Threshold	At-risk: 3-26 Island: 12-39	• If QLD at risk of separation, high probability of MSL • MSL issues with unplanned outages/islanding • Anticipate MSL will impact planned outages that restrict interconnectors
	System Normal	3-26	0-6	0	• Medium MSL probability, lots of MSL1s. Without pumps, more MSL2s
VIC	System Normal	9-34	0-2	0	• High probability of many MSL1s and a few MSL2s
NSW	System Normal	0-2	0	0	• Low probability of MSL this spring/summer

These forecasts are based on typical MSL thresholds and 2025 ESOO OPSO + AUX demand projections to be published on 21 August 2025.
There are no forecast MSL conditions in Tasmania region for the upcoming spring season.

SA System Normal



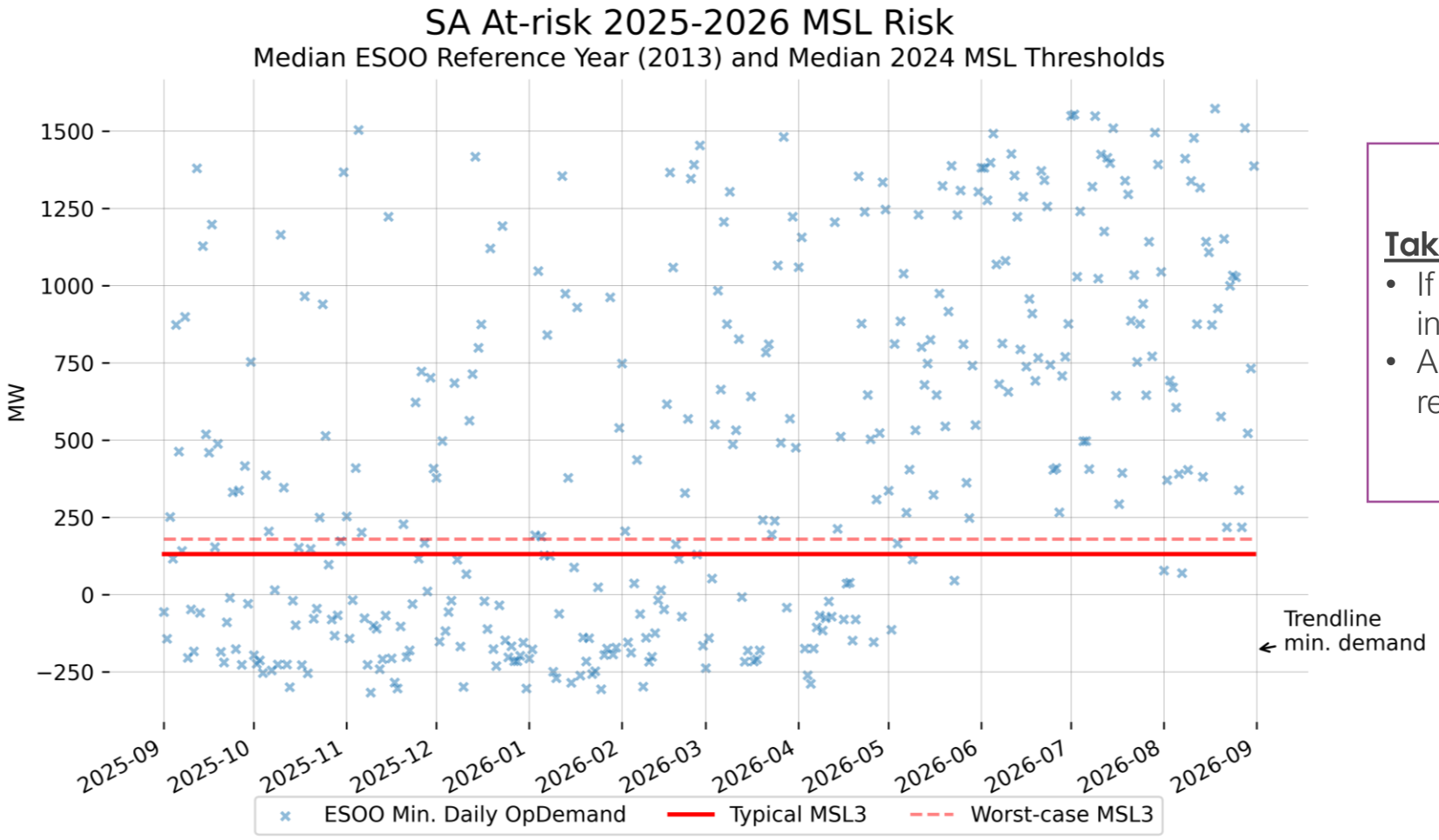
Case	MSOL	Export
Typical	Median	Typical
Worst	Median	No export
Best	Min.	Realistic max.

Typical threshold	# of days from September 2025 to Dec 2025
MSL1	9-27
MSL2	39-64
MSL3	0*

Takeaways

- High MSL probability to be managed with a System Normal procedure
- Anticipate MNs for MSL and AEMO intervention

SA At-risk



Typical threshold	# of days from September 2025 to Dec 2025
MSL2/3	56-86

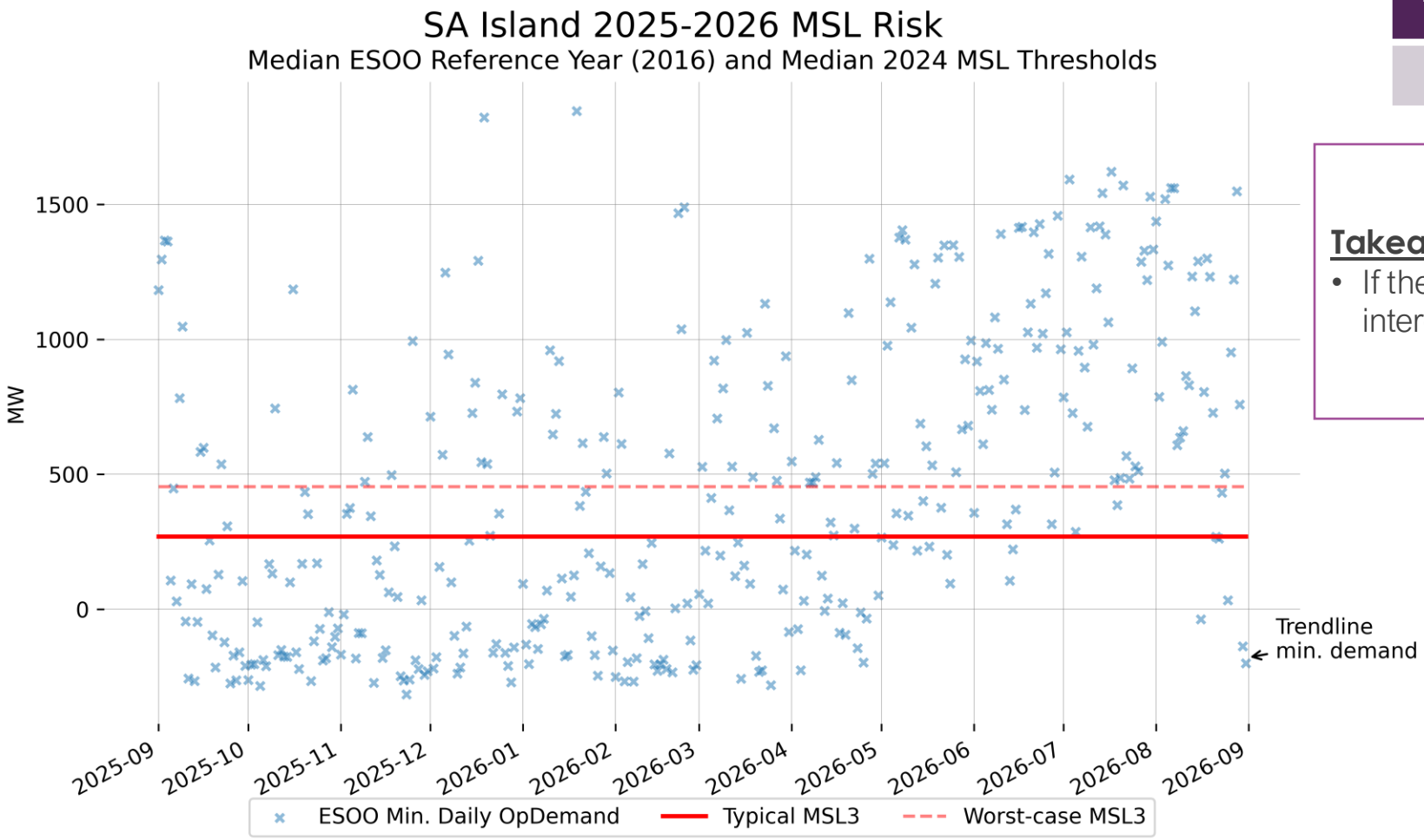
Takeaways

- If there is an unplanned outage of Heywood interconnector, high probability of MSL
- Anticipate MSL will impact planned outages that restrict SA export

N.B:

- At-risk MSL threshold shown here reflects current version of SA_12. This threshold is used to take MSL2 and MSL3 actions.
- Aim is to ultimately uplift to VIC MSL framework

SA Island



Typical threshold	# of days from September 2025 to Dec 2025
MSL2/3	66-95

Takeaways

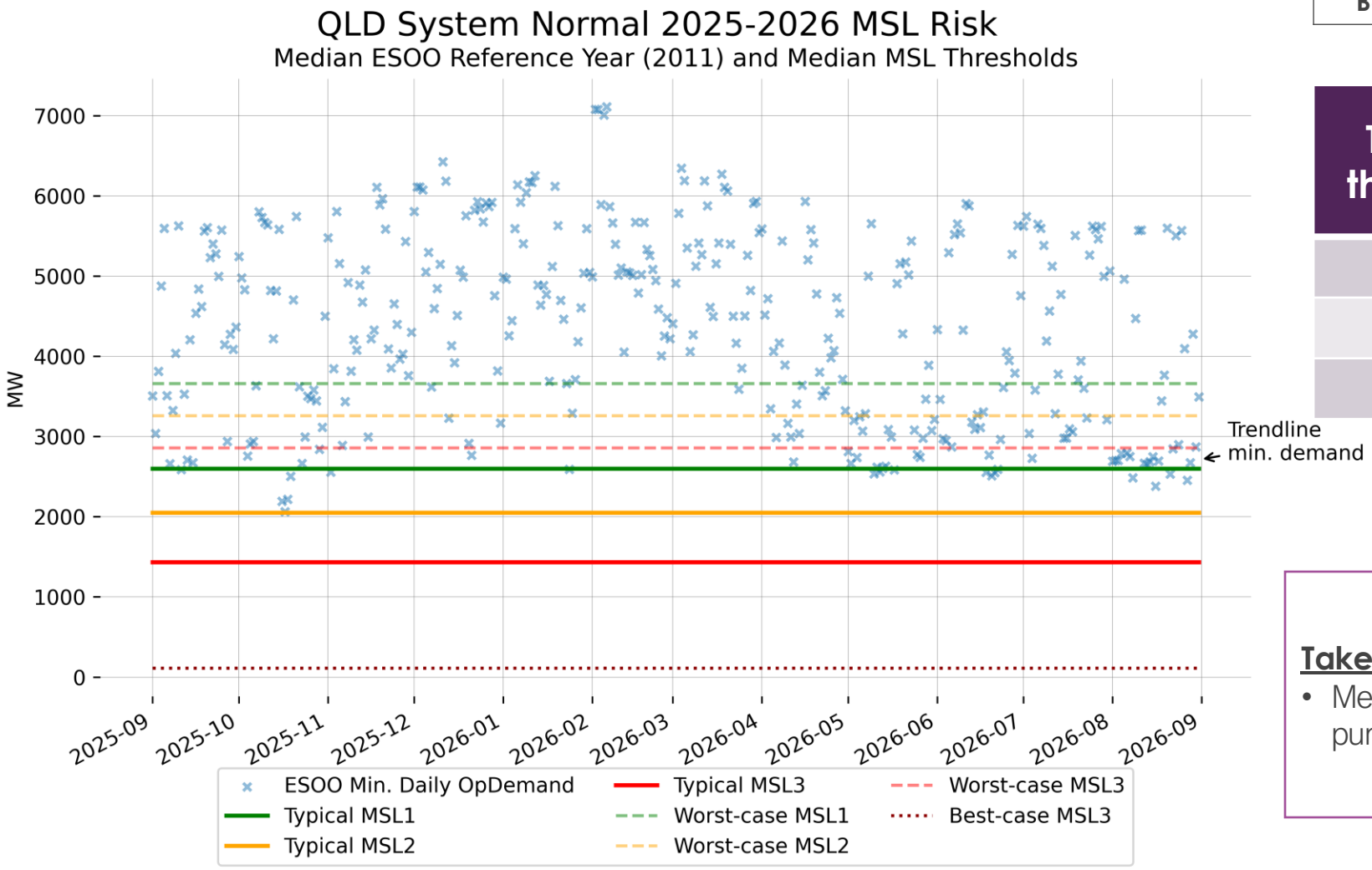
- If there is an unplanned outage of Heywood interconnector, high probability of MSL

N.B:

- Island MSL threshold shown here reflects current version of SA_12. This threshold is used to take MSL2 and MSL3 actions.
- Aim is to ultimately uplift to VIC MSL framework

QLD System Normal

Case	MSOL	Export	Pumps
Typical	Median	Coincident low demand	Full load
Worst	Median	No export	No load
Best	Min.	Realistic max.	Full load



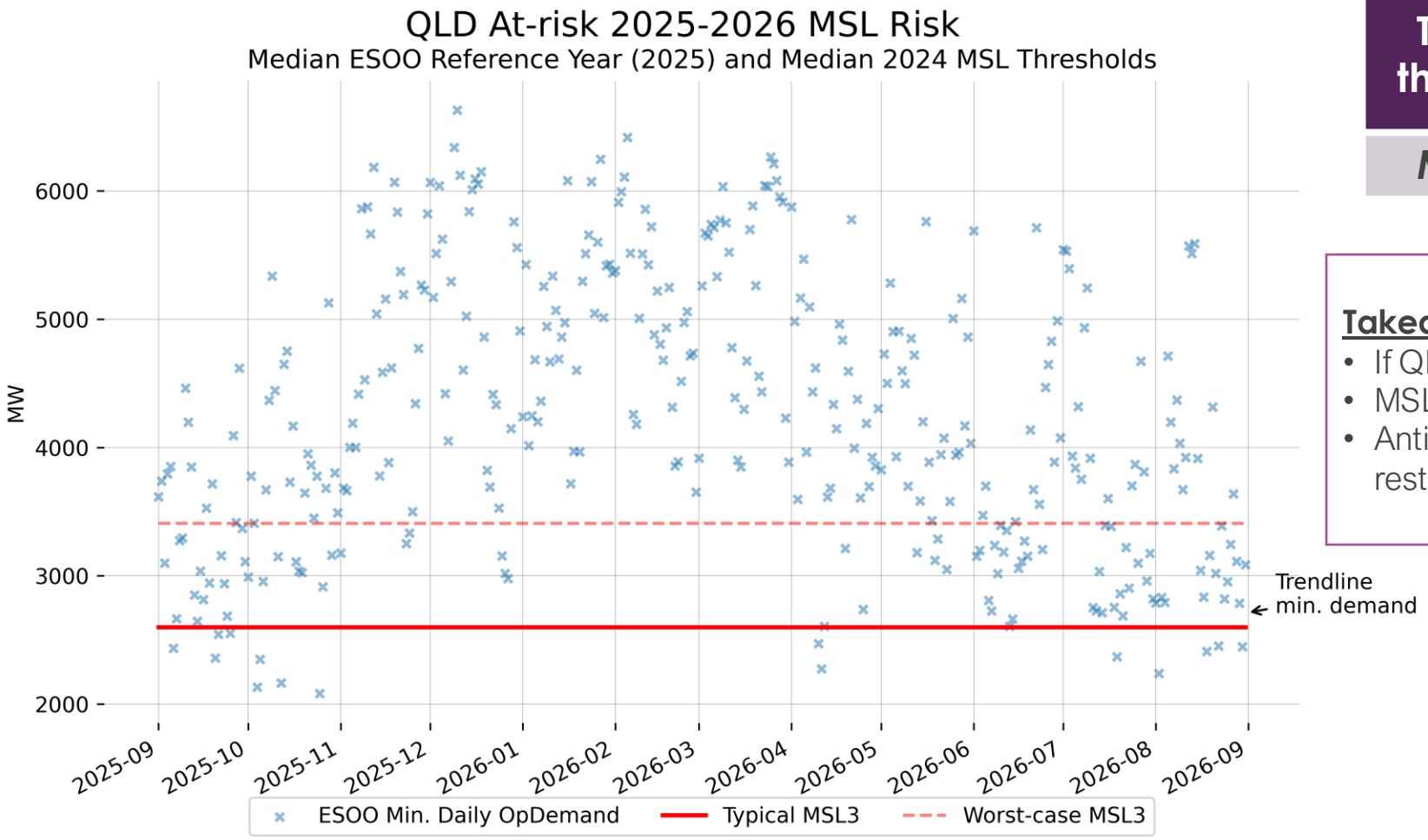
Typical threshold	# of days from September 2025 to Dec 2025
MSL1	3-26
MSL2	0-6
MSL3	0

Takeaways

- Medium MSL probability, lots of MSL1s. Without pumps, more MSL2s

N.B. thresholds below account for coincident low demand across regions

QLD At-risk



Typical threshold	# of days from September 2025 to Dec 2025
MSL2/3	3-26

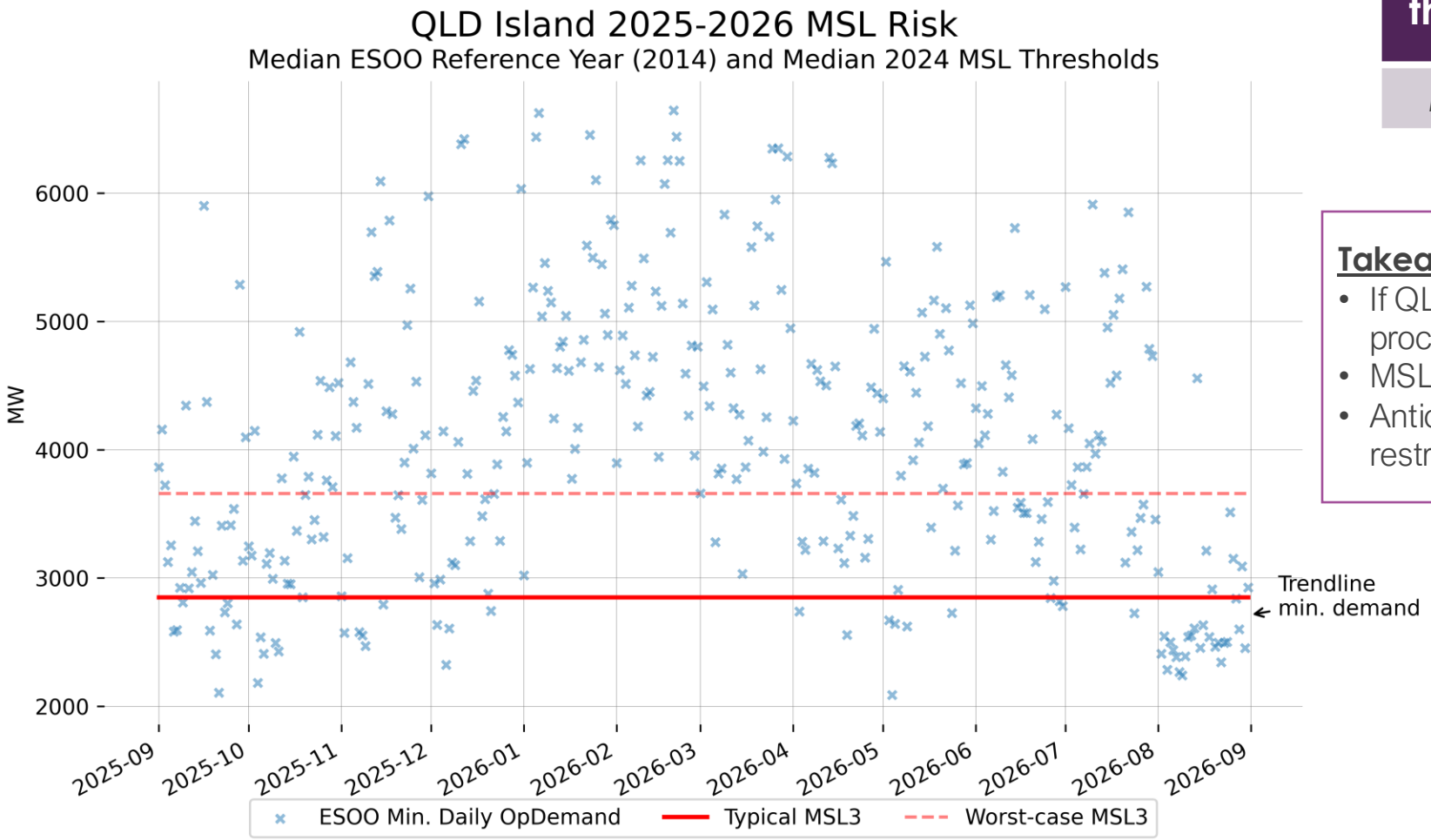
Takeaways

- If QLD at risk of separation, high probability of MSL
- MSL issues with unplanned outages/islanding
- Anticipate MSL will impact planned outages that restrict interconnectors

N.B:

- At-risk MSL threshold shown here reflects upcoming version of QLD_04. This threshold is used to take MSL2 and MSL3 actions.
- Aim is to ultimately uplift to VIC MSL framework

QLD Island



Typical threshold	# of days from September 2025 to Dec 2025
MSL2/3	12-39

Takeaways

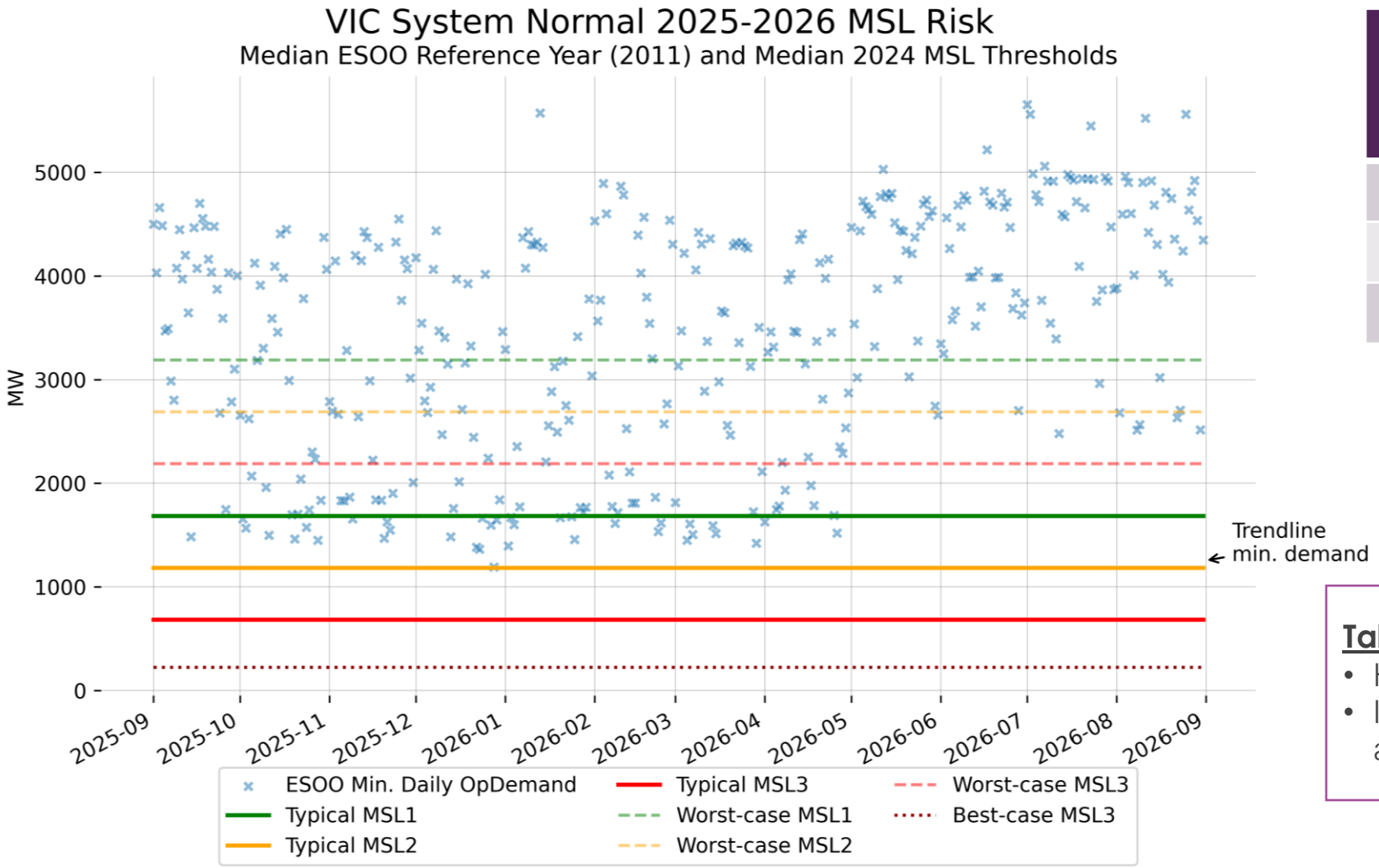
- If QLD is Islanded, high probability of MSL but procedure is in place to manage
- MSL issues with unplanned outages/islanding
- Anticipate MSL will impact planned outages that restrict interconnectors

N.B:

- Island MSL threshold shown here reflects upcoming version of QLD_04. This threshold is used to take MSL2 and MSL3 actions.
- Aim is to ultimately uplift to VIC MSL framework

VIC System Normal

Case	MSOL	Export
Typical	Median	Typical
Worst	Median	No export
Best	Min.	Realistic max.

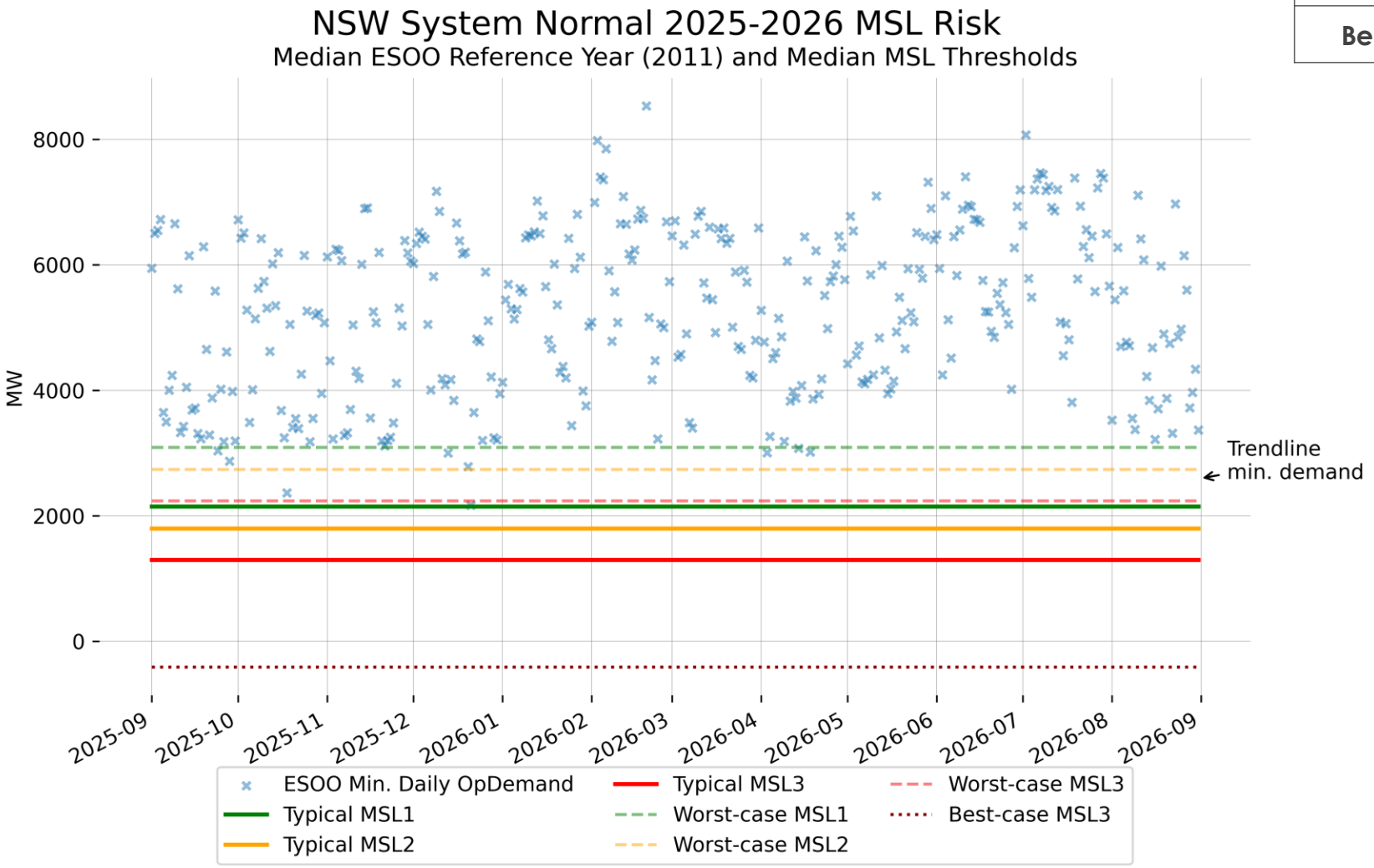


Typical threshold	# of days from September 2025 to Dec 2025
MSL1	9-34
MSL2	0-2
MSL3	0

Takeaways

- High probability of many MSL1s and a few MSL2s
- Increased risk of MSL if interconnectors are not available

NSW System Normal



Case	MSOL	Export	Pumps
Typical	Median	Coincident low demand	Full load
Worst	Median	No export	No load
Best	Min.	Realistic max.	Full load

Typical threshold	# of days from September 2025 to Dec 2025
MSL1	0-2
MSL2	0
MSL3	0

Takeaways

- Low probability of MSL in NSW this spring/summer under typical conditions

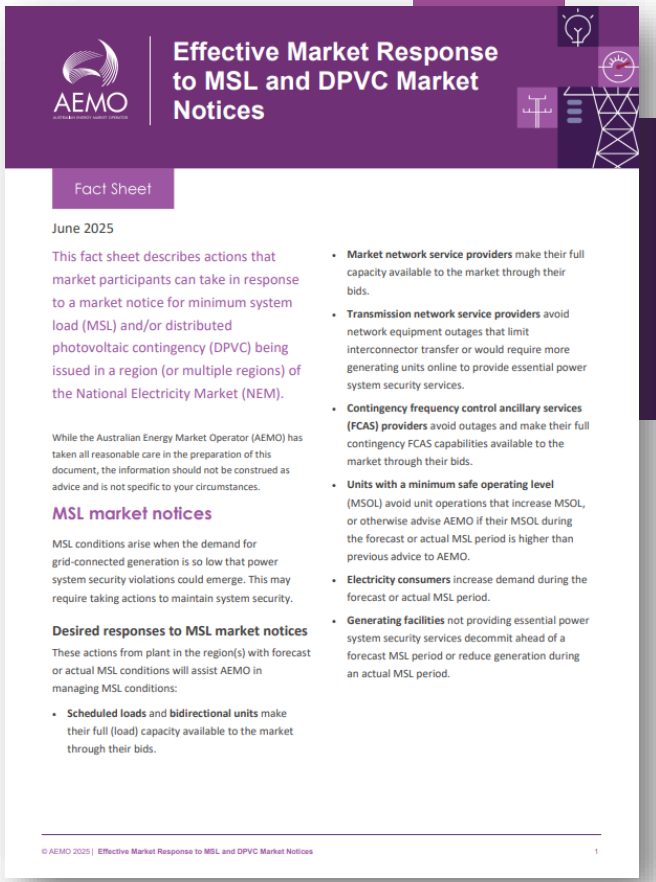
N.B. thresholds below account for coincident low demand across regions

Participant market actions

Effective responses to MSL and DPVC conditions published in a fact sheet on the AEMO website.

In summary, effective market responses include:

- Increasing scheduled load by consuming more energy
- Reducing MSL thresholds by decommitting units not required for essential system services, or avoiding network outages
  - N.B. outage assessment includes MSL assessment
- (in some cases) providing all available FCAS, especially lower services.



AEMO

Effective Market Response to MSL and DPVC Market Notices

Fact Sheet

June 2025

This fact sheet describes actions that market participants can take in response to a market notice for minimum system load (MSL) and/or distributed photovoltaic contingency (DPVC) being issued in a region (or multiple regions) of the National Electricity Market (NEM).

While the Australian Energy Market Operator (AEMO) has taken all reasonable care in the preparation of this document, the information should not be construed as advice and is not specific to your circumstances.

MSL market notices

MSL conditions arise when the demand for grid-connected generation is so low that power system security violations could emerge. This may require taking actions to maintain system security.

Desired responses to MSL market notices

These actions from plant in the region(s) with forecast or actual MSL conditions will assist AEMO in managing MSL conditions:

- **Scheduled loads** and **bidirectional units** make their full (load) capacity available to the market through their bids.
- **Market network service providers** make their full capacity available to the market through their bids.
- **Transmission network service providers** avoid network equipment outages that limit interconnector transfer or would require more generating units online to provide essential power system security services.
- **Contingency frequency control ancillary services (FCAS) providers** avoid outages and make their full contingency FCAS capabilities available to the market through their bids.
- **Units with a minimum safe operating level** (MSOL) avoid unit operations that increase MSOL, or otherwise advise AEMO if their MSOL during the forecast or actual MSL period is higher than previous advice to AEMO.
- **Electricity consumers** increase demand during the forecast or actual MSL period.
- **Generating facilities** not providing essential power system security services decommit ahead of a forecast MSL period or reduce generation during an actual MSL period.

MSL Memo

- Based on requests from participants, we will be publishing a memo in the coming weeks which will show typical/worst case/best case MSL thresholds for operational situational awareness.
- Planning thresholds for backstop capability relate to ‘worst case’.
  - Updated report for planners/policy makers is being drafted, and in meantime the December 2024 report remains current:

  Supporting secure operations with high levels of distributed resources (December 2024)

Links

- AEMO | Managing System Load
- Factsheet – Effective market response to MSL and DPVC market notices
- Learnings from industry implementation of emergency backstop report (July 2025)
- Supporting secure operations with high levels of distributed resources (December 2024)
- AEMO | MSL Transitional services for Victoria and South Australia
- AEMO | Operational demand data
- Demand Terms in EMMS Data Model Paper (updated June 2025)

AUSTRALIAN ENERGY MARKET OPERATOR

For more information visit

aemo.com.au