

## Meeting Agenda

<b>Meeting Title:</b>	Capability Class 2 Technologies (CC2T) Review Working Group
<b>Date:</b>	Thursday 26 March 2026
<b>Time:</b>	9:30 AM – 11:30 AM
<b>Location:</b>	Online

Item	Item	Responsibility	Type	Duration
1	Welcome and Agenda <ul style="list-style-type: none"> <li>Conflicts of interest</li> <li>Competition Law</li> </ul>	Chair	Noting	1 min
2	Meeting Apologies/Attendance	Chair	Noting	1 min
3	Minutes of Meeting 2026_02_05 Approved out of session <a href="#">Published 18 March 2026</a>	Chair	Noting	1 min
4	Action Items	Chair	Noting	1 min
5	Splitting Capability Class 2 - Strawman	Chair	Discussion	25 min
6	Current State Analysis	RBP	Discussion	45 min
7	Future State Analysis	RBP	Discussion	45 min
8	General Business	Chair	Discussion	1 min

Please note, this meeting will be recorded.

## Competition and Consumer Law Obligations

Members of the Working Group (**Members**) note their obligations under the *Competition and Consumer Act 2010 (CCA)*.

If a Member has a concern regarding the competition law implications of any issue being discussed at any meeting, please bring the matter to the immediate attention of the Chairperson.

Part IV of the CCA (titled "Restrictive Trade Practices") contains several prohibitions (rules) targeting anti-competitive conduct. These include:

- (a) **cartel conduct**: cartel conduct is an arrangement or understanding between competitors to fix prices; restrict the supply or acquisition of goods or services by parties to the arrangement; allocate customers or territories; and or rig bids.
- (b) **concerted practices**: a concerted practice can be conceived of as involving cooperation between competitors which has the purpose, effect or likely effect of substantially lessening competition, in particular, sharing Competitively Sensitive Information with competitors such as future pricing intentions and this end:
  - a concerted practice, according to the ACCC, involves a lower threshold between parties than a contract arrangement or understanding; and accordingly; and
  - a forum like the MAC is capable being a place where such cooperation could occur.
- (c) **anti-competitive contracts, arrangements understandings**: any contract, arrangement or understanding which has the purpose, effect or likely effect of substantially lessening competition.
- (d) **anti-competitive conduct (market power)**: any conduct by a company with market power which has the purpose, effect or likely effect of substantially lessening competition.
- (e) **collective boycotts**: where a group of competitors agree not to acquire goods or services from, or not to supply goods or services to, a business with whom the group is negotiating, unless the business accepts the terms and conditions offered by the group.

A contravention of the CCA could result in a significant fine (up to \$500,000 for individuals and more than \$10 million for companies). Cartel conduct may also result in criminal sanctions, including gaol terms for individuals.

**Sensitive Information** means and includes:

- (a) commercially sensitive information belonging to a Member's organisation or business (in this document such bodies are referred to as an Industry Stakeholder); and
- (b) information which, if disclosed, would breach an Industry Stakeholder's obligations of confidence to third parties, be against laws or regulations (including competition laws), would waive legal professional privilege, or cause unreasonable prejudice to the Coordinator of Energy or the State of Western Australia).

### Guiding Principle – what not to discuss

In any circumstance in which Industry Stakeholders are or are likely to be in competition with one another a Member must not discuss or exchange with any of the other Members information that is not otherwise in the public domain about commercially sensitive matters, including without limitation the following:

- (a) the rates or prices (including any discounts or rebates) for the goods produced or the services produced by the Industry Stakeholders that are paid by or offered to third parties;
- (b) the confidential details regarding a customer or supplier of an Industry Stakeholder;
- (c) any strategies employed by an Industry Stakeholder to further any business that is or is likely to be in competition with a business of another Industry Stakeholder, (including, without limitation, any strategy related to an Industry Stakeholder's approach to bilateral contracting or bidding in the energy or ancillary/essential system services markets);
- (d) the prices paid or offered to be paid (including any aspects of a transaction) by an Industry Stakeholder to acquire goods or services from third parties; and
- (e) the confidential particulars of a third party supplier of goods or services to an Industry Stakeholder, including any circumstances in which an Industry Stakeholder has refused to or would refuse to acquire goods or services from a third party supplier or class of third party supplier.

### Compliance Procedures for Meetings

If any of the matters listed above is raised for discussion, or information is sought to be exchanged in relation to the matter, the relevant Member must object to the matter being discussed. If, despite the objection, discussion of the relevant matter continues, then the relevant Member should advise the Chairperson and cease participation in the meeting/discussion and the relevant events must be recorded in the minutes for the meeting, including the time at which the relevant Member ceased to participate.



## Agenda Item 4: Action Items

CC2TRWG Meeting 2026\_03\_26

Shaded	Shaded action items are actions that have been completed since the last MAC meeting. Updates from last MAC meeting provided for information in <b>RED</b> .
Unshaded	Unshaded action items are still being progressed.
Missing	Action items missing in sequence have been completed from previous meetings and subsequently removed from log.

Item	Action	Responsibility	Meeting Arising	Status
1/2025	AEMO to clarify how ESR capacity is considered in the spare capacity calculation	AEMO	2025_12_04	<b>Closed</b> AEMO provided a response at the 5 February 2026 meeting
2/2025	AEMO to advise the CC2TWG the date that the technical analysis is expected to be completed	EPWA	2025_12_04	<b>Open</b> AEMO has provided further data to EPWA. A historical stress analysis and future state analysis are provided in these papers.



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# Splitting Capability Class 2 – Strawman

Working together for a  
**brighter** energy future.

# Strawman: Capability Class 2 Split for NAQ purposes

## Splitting Capability Class 2 at the Facility level

Type	Description
Capability Class 2(a) – Hybrid	A Facility that includes Separately Certified Components that are over 50% Capability Class 2, with the remaining being: <ul style="list-style-type: none"><li>• Capability Class 1; or</li><li>• Capability Class 3; or</li><li>• A mix of Capability Class 1 and Capability Class 3.</li></ul>
Capability Class 2(b) – Pure ESR	A Facility that only includes Separately Certified Components that are Capability Class 2 and certified as ESRs.
Capability Class 2(c) – Pure DSP	A Facility that only includes Separately Certified Components that are Capability Class 2 and certified as DSPs.

# Strawman for new NAQ prioritisation order

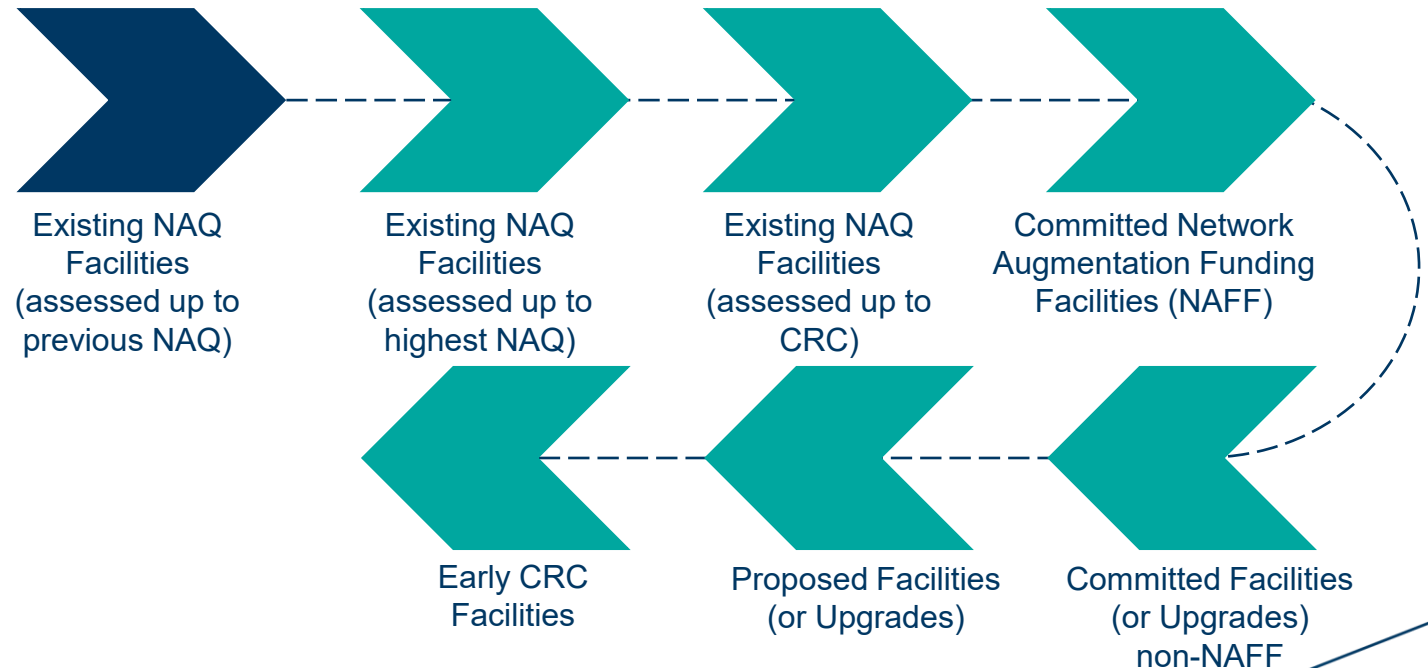
Capability Class is first tie-breaker for assigning NAQ (within the same step), in order of:

1. Capability Class 1 Facilities
2. Capability Class 3 Facilities
3. Capability Class 2 Facilities

**New order - Strawman:**

1. Capability Class 1 Facilities
2. Capability Class 3 Facilities
3. Capability Class 2(a) Facilities (Hybrids)
4. Capability Class 2(b) Facilities (Pure ESR)
5. Capability Class 2(c) Facilities (Pure DSP)

## Steps of the NAQ process



# Discussion

The benefit of the proposed split is that it could incentivise more firmed up renewable generation

→ Promoting the sustainability and reliability aspect of the State Electricity Objective

The final proposal will need to be assessed against implementation costs

## Does the Working Group:

- support the proposed split of Capability Class 2?
- support the proposed priority order for the NAQ?



Department of  
Energy and Economic  
Diversification

Energy Policy WA

# Capability Class 2 Technologies (CC2T) Review

## Technical Analysis

26 March 2026

Working together for a  
**brighter** energy future.

# Title: Agenda

- 
- 1 Introduction and scope
  - 2 Current state analysis: Stage 1 results recap
  - 3 Current state analysis: Stage 2 results
  - 4 Future State Analysis: Preliminary results
  - 5 Implications for policy

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**Annex 1** Abbreviations

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# Historical review of system stress events

## Introduction and scope

# What is a System Stress Event (SSE)?

## Market Advisories and manual constraints used to identify SSEs occurring between November 2023 and August 2025

- Market advisories containing Low Reserve Condition declarations used to identify SSEs
- Manual constraints applied by AEMO to capture additional events not captured by advisories
- SSE start time based on the start-time specified in the most recent advisory relating to that event (so that any changes in event timing can be picked up)
- SSE end time based on the end-time specified in the most recent advisory relating to that event
- AEMO reviewed the 39 previously identified SSEs and recommended removing 13 because they resolved on their own

Dataset	Includes	Excludes
Market advisories 25 SSEs identified	Energy & ancillary services shortfalls	<ul style="list-style-type: none"> <li>• Non-shortfall events (transmission or comms events)</li> <li>• Minor manual constraints</li> <li>• Ramp rate or RRS shortfalls</li> <li>• Emergency of High-Risk Operating State advisories due to system instability</li> <li>• Network and infrastructure failures</li> </ul>
Manual constraints 1 SSE identified	Non-network constraints applied outside the above SSE durations	<ul style="list-style-type: none"> <li>• Constraints relating to above SSEs</li> <li>• Network constraints</li> <li>• RoCoF shortfalls</li> <li>• Muja 6 reserve mode</li> </ul>

Note:

- SSE duration (end time - start time) doesn't necessarily reflect how long ESR would be required.
- Insufficient information to determine whether ESR was needed for the full length of each event

# Current-State Technical Analysis

## Stage 1 and Stage 2

### Stage 1: Identify Historical System Stress Events (SSEs)

- Identified SSEs using Market Advisories and Manual Constraints between November 2023 to August 2025
- 26 SSEs were identified over this period
- Analysed the characteristics of these SSEs such as seasonality, start and end times, type of day (business/non-business), duration, and common causes

### Stage 2: Detailed Analysis of the 48 hours leading up to and including each SSE

- For each of the 26 SSEs, analysed data for ESR Charge Levels, Energy-Sent Out, FCESS quantities, WEM Energy Prices
- Analysed ESR Charge Levels both at event start and at ESR Obligation Interval (ESROI) start for each event
- Additional detailed analysis for the 5 SSEs in which individual ESRs recorded charge levels below 50% at either event start or at ESROI start
- Investigated possible drivers of low ESR charge levels during these 5 SSEs
- Compared revenue for discharging ESRs prior to SSE start with refunds paid during the ESROI period on the SSE day

# Technical Analysis

Current state (Stage 1) results recap from previous Working Group meeting

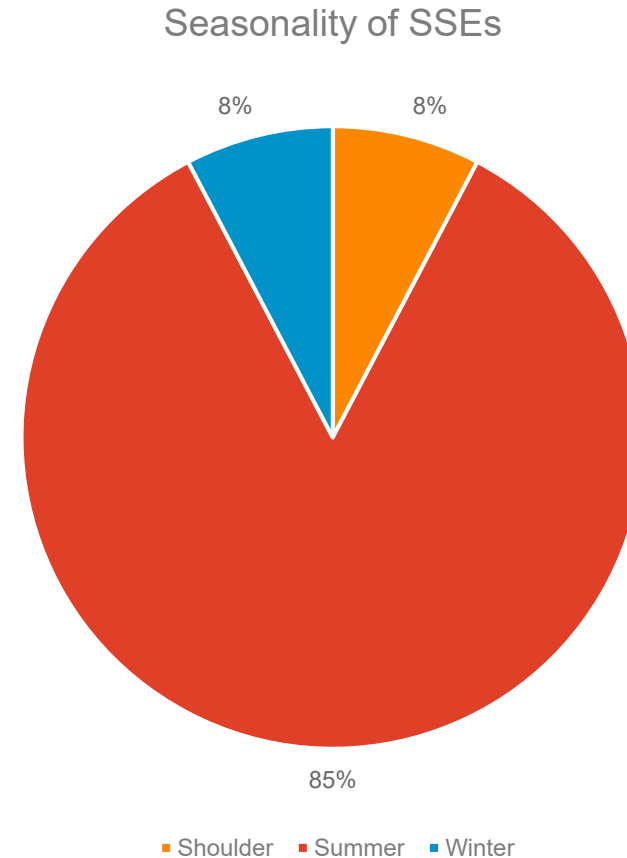
# Stage 1 Current-state Technical Analysis

## Update from previous Working Group Meeting

**26 SSEs were identified between November 2023 and August 2025**

**SSEs are not a “Hot Season” only phenomena**

- 16% of events occurred in shoulder and winter months



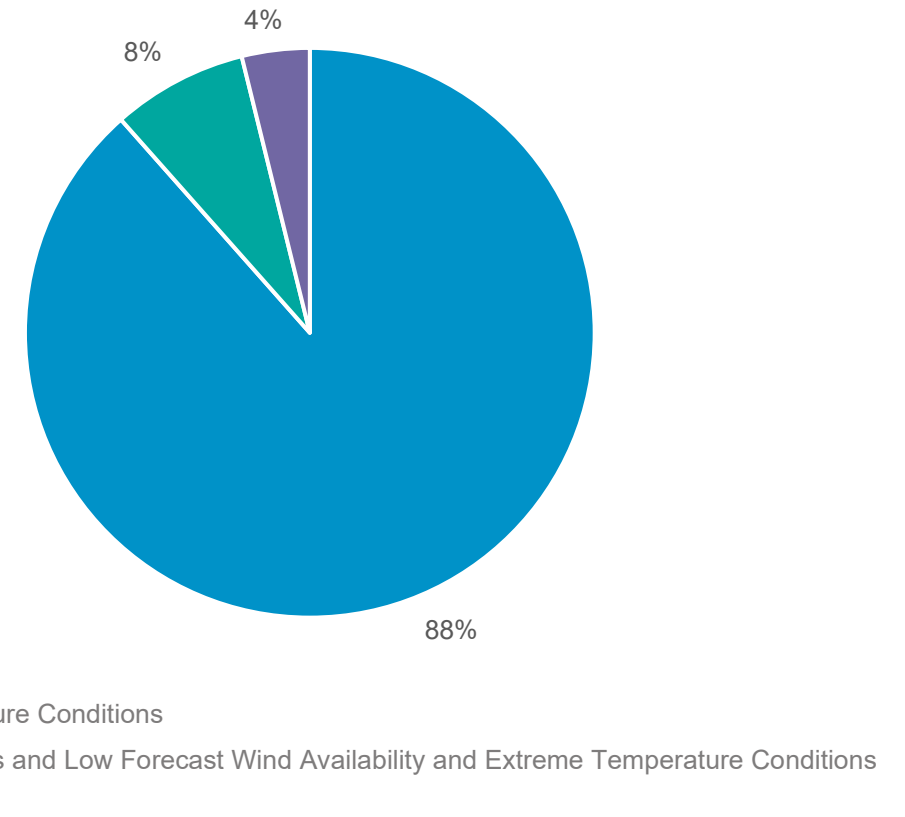
# Stage 1 Current-state Technical Analysis

## Update from previous Working Group Meeting

**23 events (88% of total) were triggered by extreme temperatures**

- Most of them (20) occurred in summer
- Low wind availability also tends to occur in summer– combination of scheduled outages and extreme (hot) temperatures can cause system stress

Common Causes of SSEs

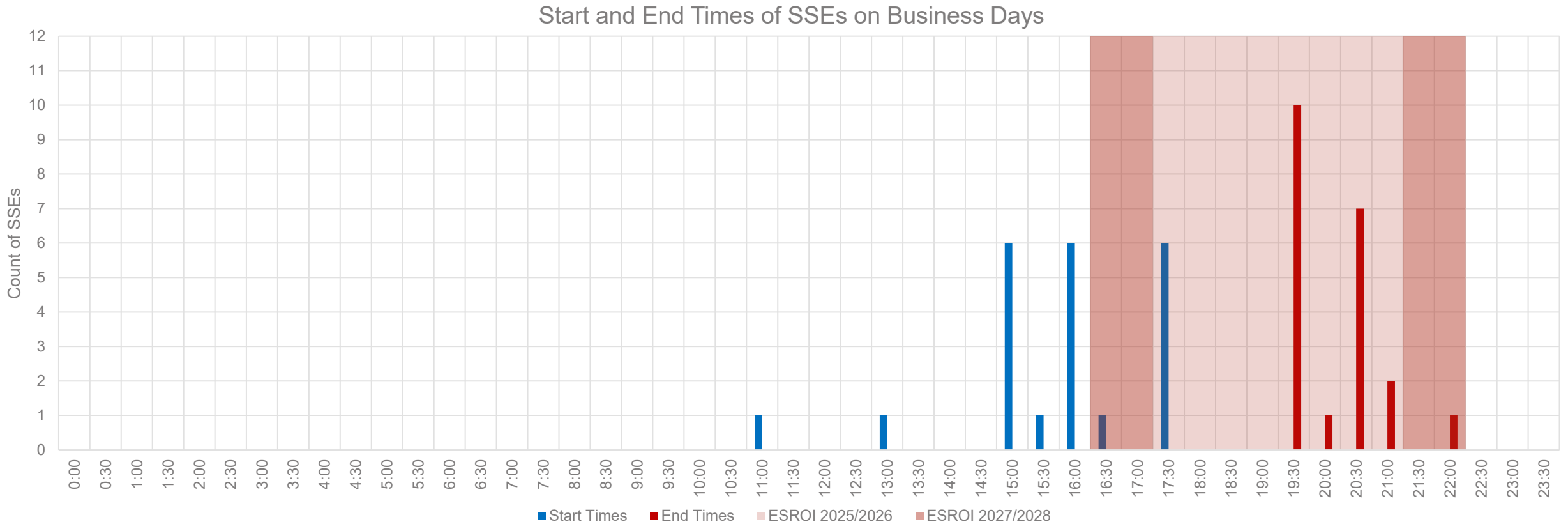


# Stage 1 Current-State Technical Analysis

Update from previous Working Group Meeting

Most events started before grandfathered ESROIs (5:30pm)

6-hour ESROD captures events better, but there were still 19 of 26 events that occurred prior to 4:30pm

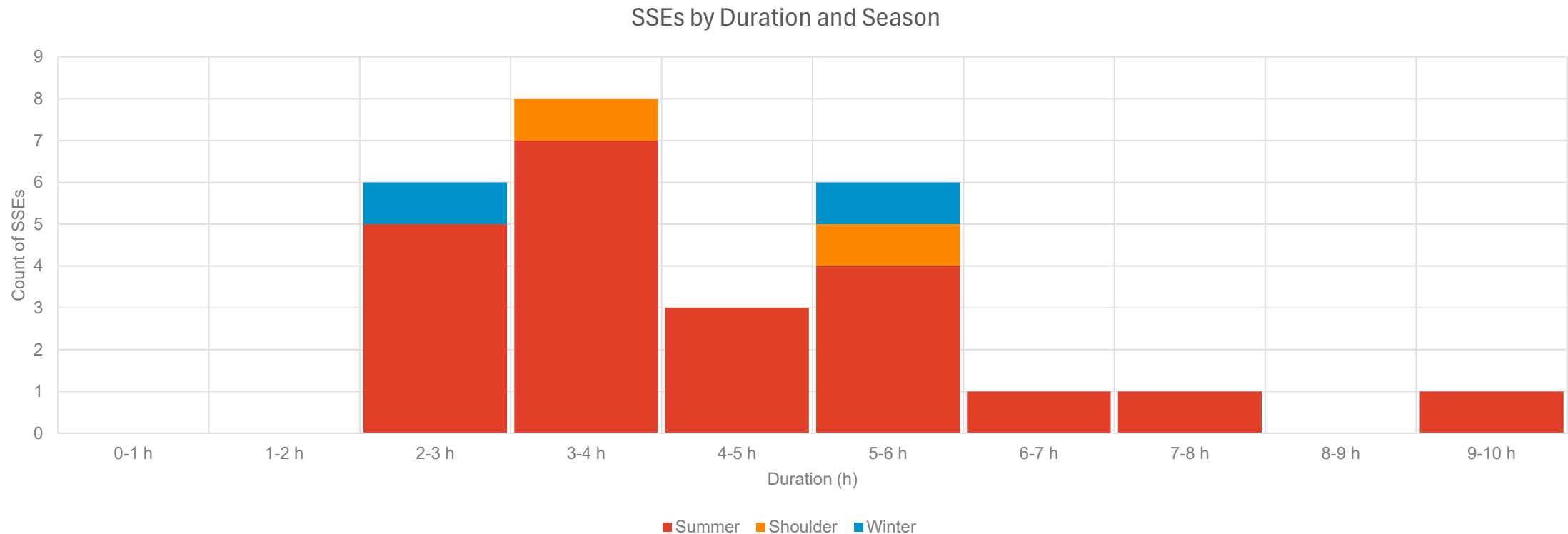


# Stage 1 Current-State Technical Analysis

## Update from previous Working Group Meeting

### Most events are 3-4 hours in duration

- Longer duration events possible but most likely to occur in summer



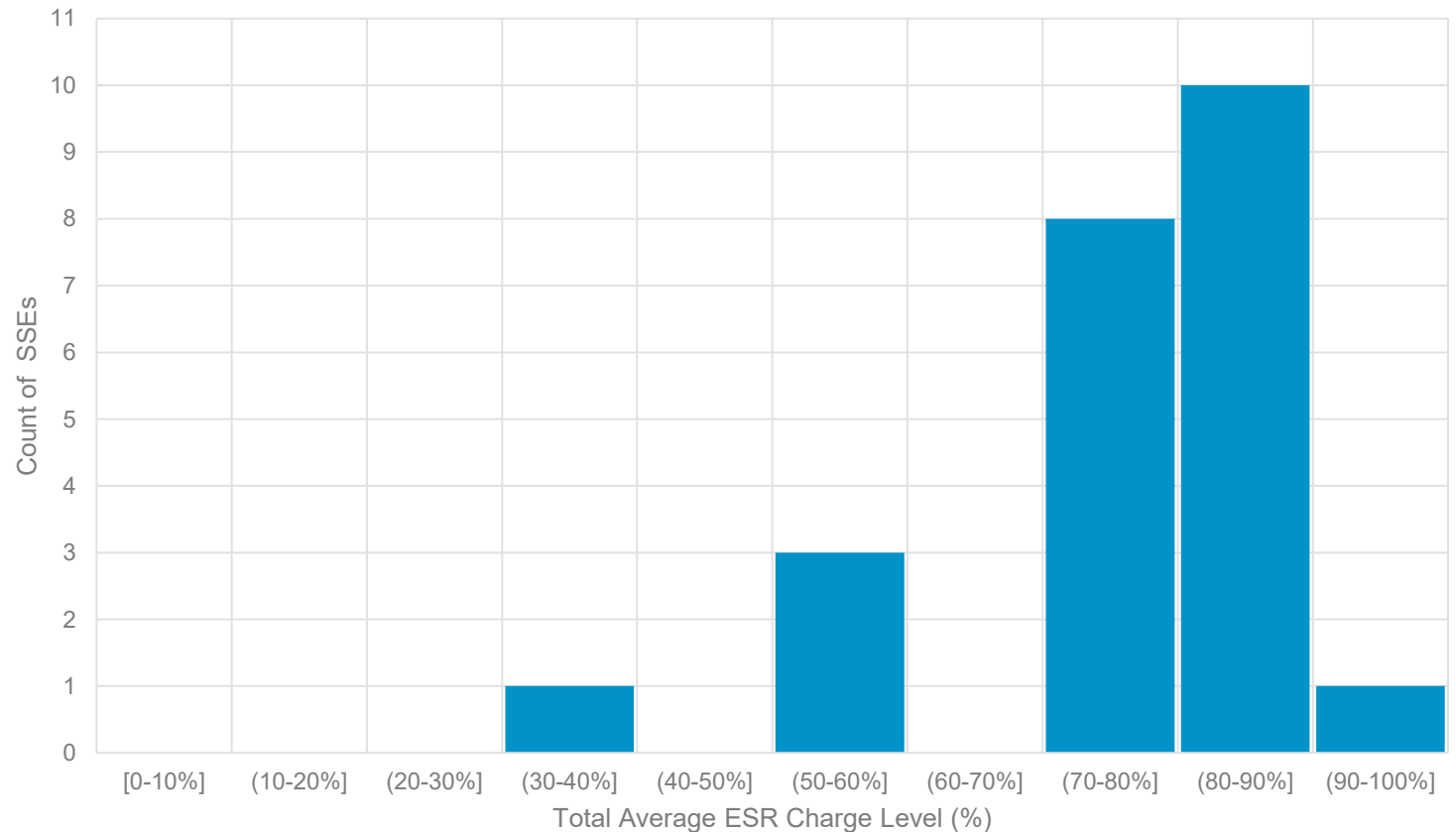
# Stage 1 Current-State Technical Analysis

## Update from previous Working Group Meeting

### Average ESR fleet charge level >=70% for 83% of events

- Average fleet charge level <50% for 1 event only
- Stage 2 examines SSEs were during which ESR have depleted charge prematurely

Number of SSEs by Total Average ESR Charge Level (%) at SSE Start



\*Sourced from SCADA Case data.

# Technical Analysis

Current State: Stage 2 results

# Current-State Technical Analysis

## Stage 2

As part of Stage 2 of the CC2TR Current-State Technical Analysis, Frequency Co-Optimised Essential System Service (FCESS) and Energy dispatch data was analysed.

The period analysed was 48h prior to the start of each SSE (of the 26 total SSEs identified) until the end of each SSE.

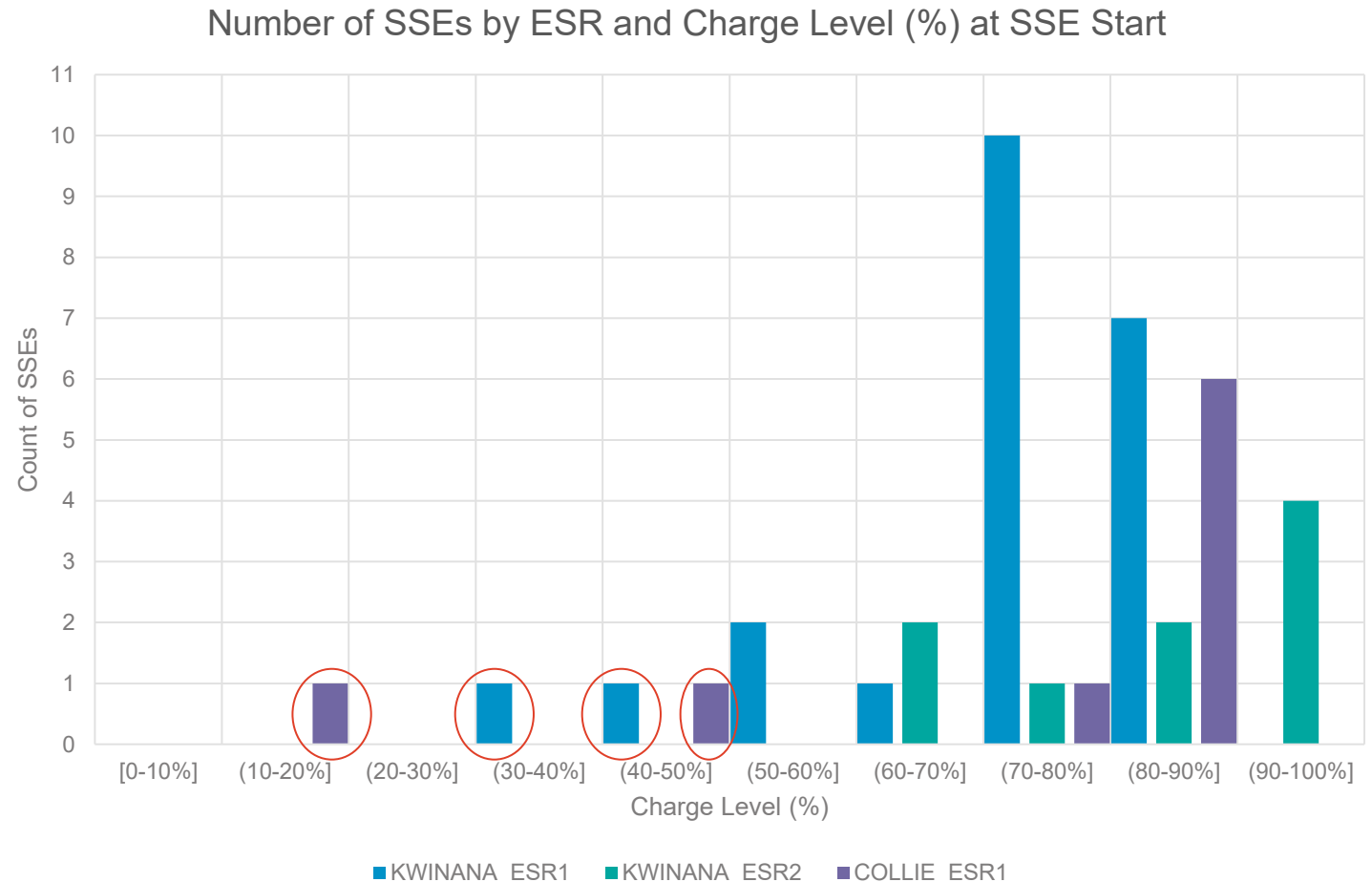
WEM Energy Prices data was also analysed for the same periods.

# Stage 2 Current-State Technical Analysis

## ESR Charge at Event Start for all SSEs

As part of Stage 2 of the CC2TR Current-State Technical Analysis, of the 26 SSEs identified, SSEs in which individual ESRs recorded charge levels below 50% at the start of the event were analyzed.

- This chart shows the number of SSEs by charge level (%) for each ESR at event start
- The 4 SSEs selected for further analysis are circled in red



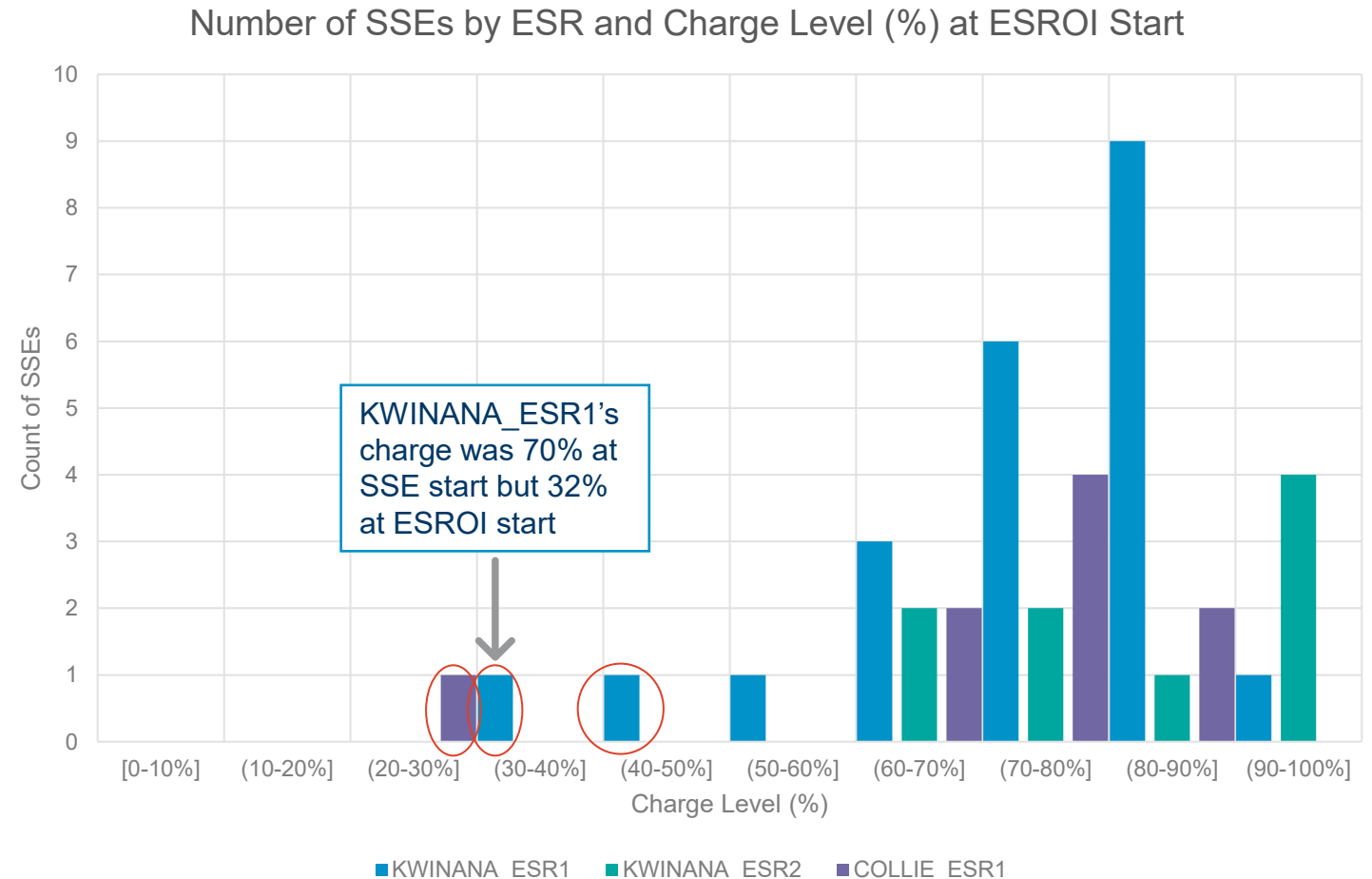
\*Sourced from SCADA Case data.

# Stage 2 Current-State Technical Analysis

## ESR Charge at ESROI Start for all SSEs

**SSEs in which individual ESRs recorded charge levels below 50% at the start of the correspondent ESROI were also analysed**

- This chart shows the number of SSEs by charge level (%) for each ESR at ESROI start
- The 3 SSEs when ESR charge was less than 50% at ESROI start are circled in red
- 2 of these 3 SSEs had an ESR charge level below 50% both at event start and ESROI start
- The remaining SSE, on 11/12/2024, KWINANA\_ESR1 was 70% charged at event start at 15:00, however, later at ESROI start it was only 32%.
  - This is SSE #5.



\*Sourced from SCADA Case data.

# Stage 2 Current-State Technical Analysis

## 5 SSEs in Detail

For the 5 SSEs identified, the table on the right shows

- the dates;
- start times;
- end times; and
- ESR charge levels.
- For the SSE that commenced after the ESROI start time, COLLIE\_ESR1 charge level was below 50% both at event start and ESROI start (highlighted in turquoise).

#	SSE Date	SSE Start Time	SSE End Time	ESR Charge Level at SSE start	ESR Charge Level at ESROI start	ESROI Start
1	13/01/2024	16:00	20:00	KWINANA_ESR1: 35%	KWINANA_ESR1: 50%	16:30
2	10/12/2024	15:00	20:30	KWINANA_ESR1: 42%	KWINANA_ESR1: 62%	17:30
3	23/01/2025	13:00	20:30	COLLIE_ESR1: 44%	COLLIE_ESR1: 64%	17:30
4	25/08/2025	17:45	23:40	COLLIE_ESR1: 17%	COLLIE_ESR1: 22%	17:30
5	11/12/2024	15:00	20:30	KWINANA_ESR1: 70%	KWINANA_ESR1: 32%	17:30

# Stage 2 Current-State Technical Analysis

## FCESS

**FCESS enablement quantities for the 4 of the identified SSEs were analysed**

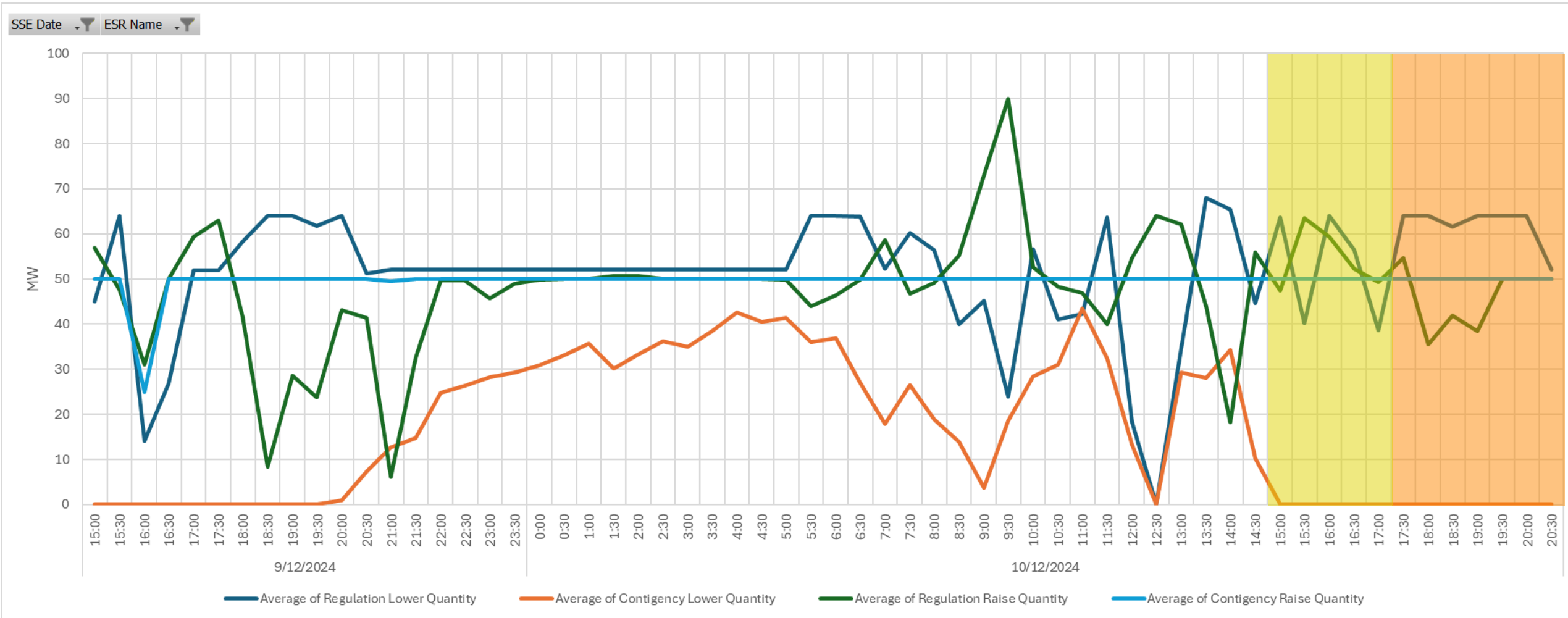
**No clear pattern was observed to suggest that low charge levels were related to FCESS dispatch.**

**The graph in the following slide is an example of FCESS quantities for an SSE:**

- It covers the period from 24 hours prior to the start of the SSE through to the end of the SSE
- The orange shaded rectangle indicates the duration of the ESROI, while the yellow rectangle indicates the start of the event
- The lines represent FCESS quantities (Regulation Lower, Contingency Lower, Regulation Raise, and Contingency Raise) in MW for the ESR specified in the slide title

# SSE 2: FCESS

SSE 10/12/2024 from 15:00 to 20:30 KWINANA\_ESR1 had 42% charge level at event start



# Stage 2 Current-State Technical Analysis

## ChargeLevel/DischargeLevelV2 vs. Energy Price

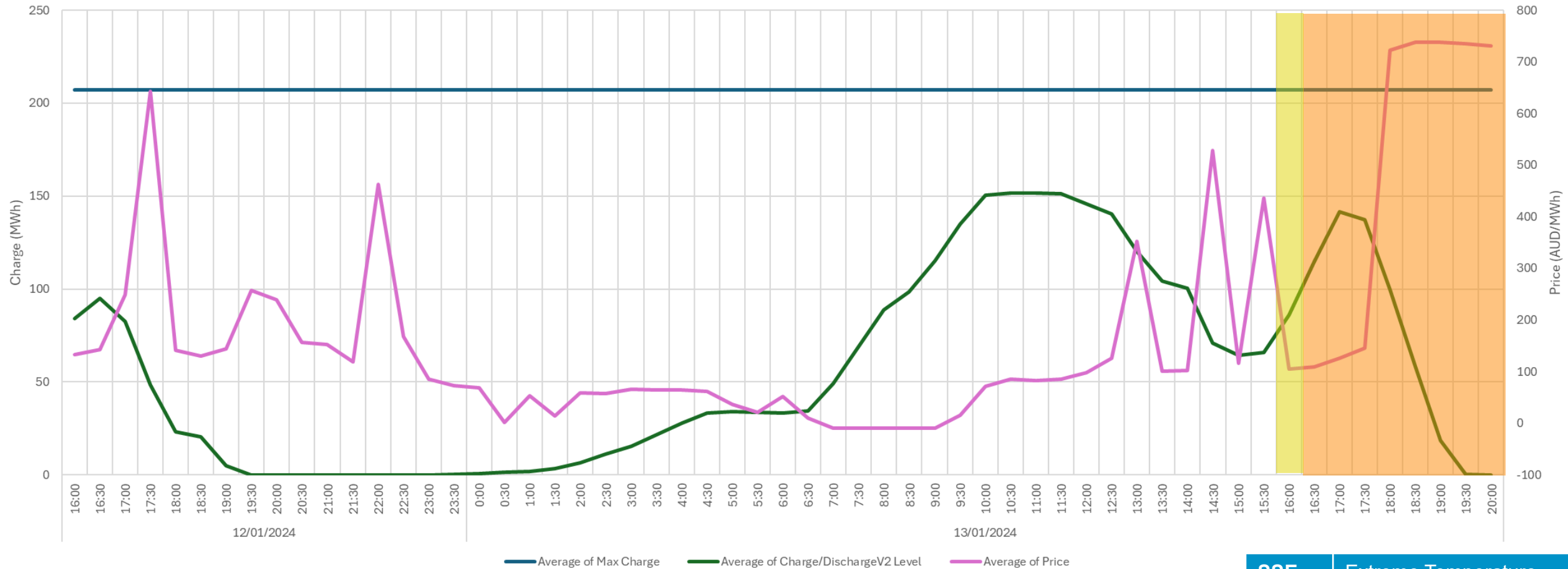
The following graphs compare ChargeLevel/DischargeLevelV2 with WEM Energy Prices for the 4 of the identified SSEs:

- From November 2023 to 13/05/2024 (exclusive) ChargeLevel data is used, while from 13/05/2024 onward DischargeLevelV2 is used to represent ESRs charge in MWh for each dispatch interval
- Each graph covers the period from 24 hours prior to the start of the SSE through to the end of the SSE
- Orange shaded areas indicate the duration of the ESROI, while yellow shaded areas show the event start
- Pink lines represent WEM Energy Prices (AUD/MWh), dark green lines the ESR ChargeLevel/DischargeLevelV2 (MWh), and dark blue lines the ESR maximum charge (MWh)
- Charge variables are sourced from SCADA Case data

# SSE 1: ChargeLevel/DischargeLevelV2 vs. Energy Price

SSE 13/01/2024 from 16:00 to 20:00 KWINANA\_ESR1 had 35% charge level at event start

ESR Name  SSE Date

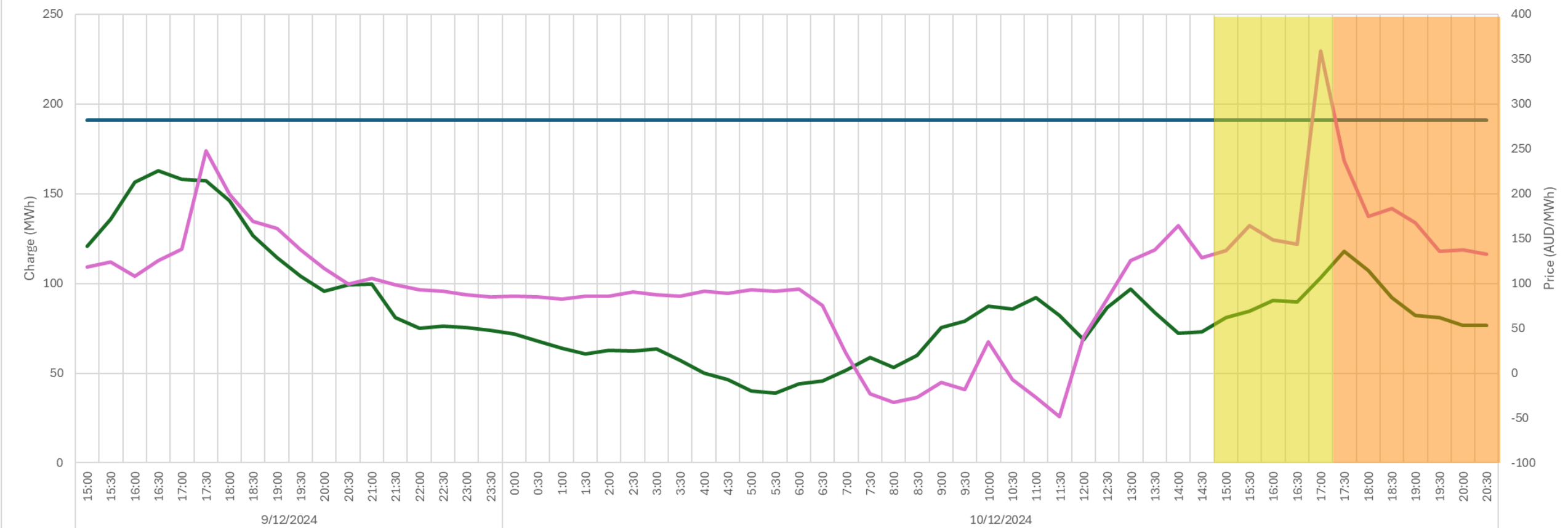


**SSE Cause** Extreme Temperature Conditions (Heatwaves)

# SSE 2: ChargeLevel/DischargeLevelV2 vs. Energy Price

SSE 10/12/2024 from 15:00 to 20:30 KWINANA\_ESR1 had 42% charge level at event start

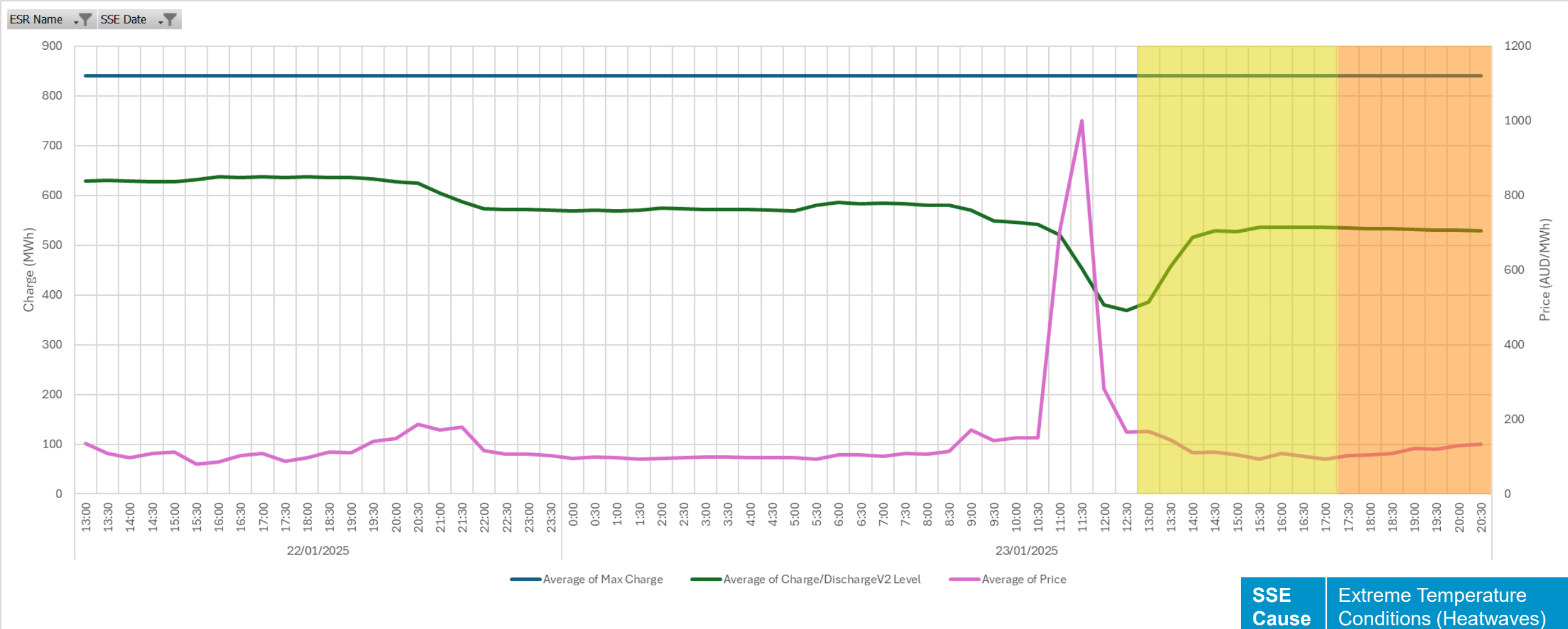
ESR Name  SSE Date



**SSE Cause** Extreme Temperature Conditions (Heatwaves)

# SSE 3: ChargeLevel/DischargeLevelV2 vs. Energy Price

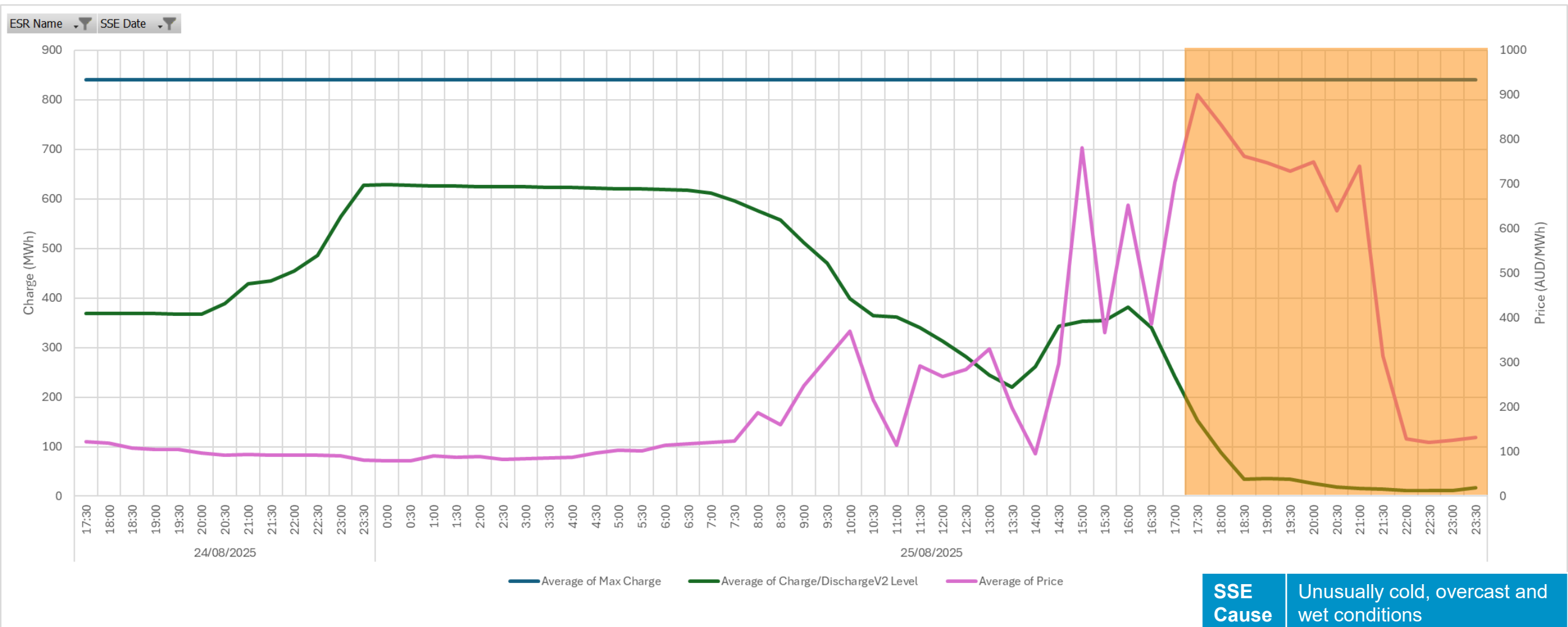
SSE 23/01/2025 from 13:00 to 20:30 COLLIE\_ESR1 had 44% charge level at event start



**SSE Cause** Extreme Temperature Conditions (Heatwaves)

# SSE 4: ChargeLevel/DischargeLevelV2 vs. Energy Price

SSE 25/08/2025 from 17:45 to 23:40 COLLIE\_ESR1 had 17% charge level at event start

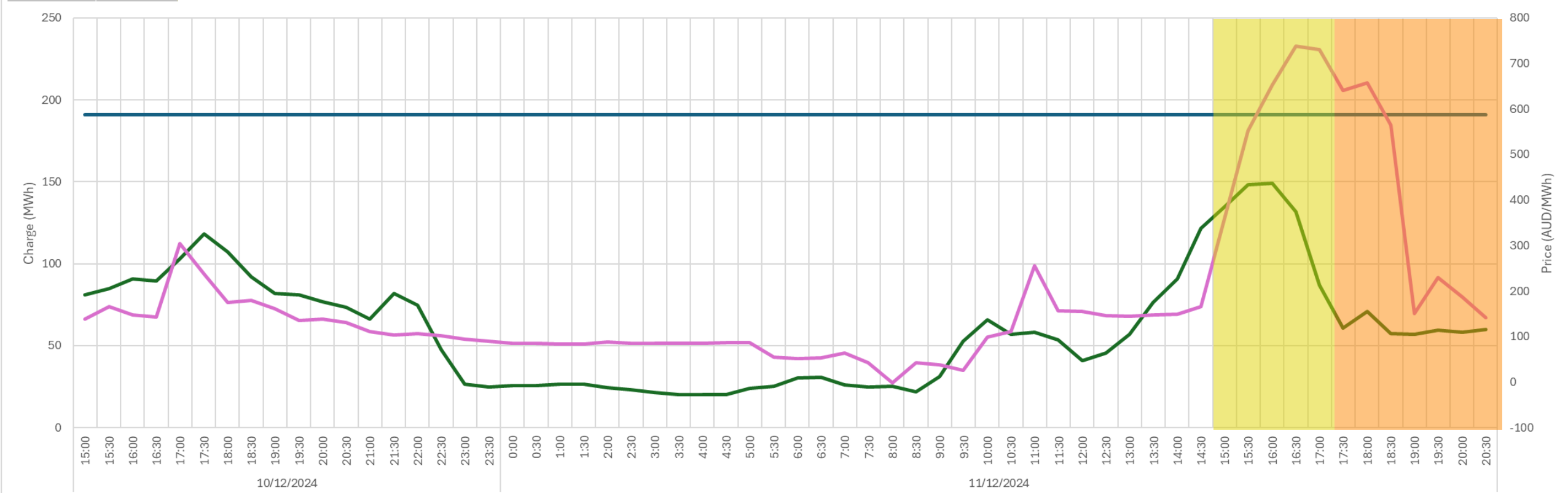


**SSE Cause** Unusually cold, overcast and wet conditions

# SSE 5: ChargeLevel/DischargeLevelV2 vs. Energy Price

SSE 11/12/2024 from 15:00 to 20:30 KWINANA\_ESR1 had 32% charge level at ESROI start (orange)

ESR Name  SSE Date



— Average of Max Charge — Average of Charge/DischargeV2 Level — Average of Price

**SSE Cause**  
Scheduled generation Outages, low forecast wind availability, and high temperature forecasts

# Stage 2 Current-State Technical Analysis

## Conclusions

**Low states of charge when entering SSEs or ESROIs appear to be primarily driven by high energy prices earlier in the day**

- High prices result in ESRs being dispatched to discharge, and prevent full recharging

**For all 5 SSEs analysed, the information available to EPWA suggests revenue earned from discharging earlier in the day was greater than the refund paid during ESROI on the same day:**

- As a result, participants have an overall gain after paying refunds during the ESROI
- This suggests that the refund mechanism does not ensure that ESR participants enter the ESROI with a high state of charge

**It was also observed:**

- FCESS quantities do not show a clear explanation for the low ESR charge levels at event start, indicating that low charge does not appear to be related to FCESS dispatch

# Technical Analysis

## Preliminary Future State Analysis

# Future-State Technical Analysis - Methodology

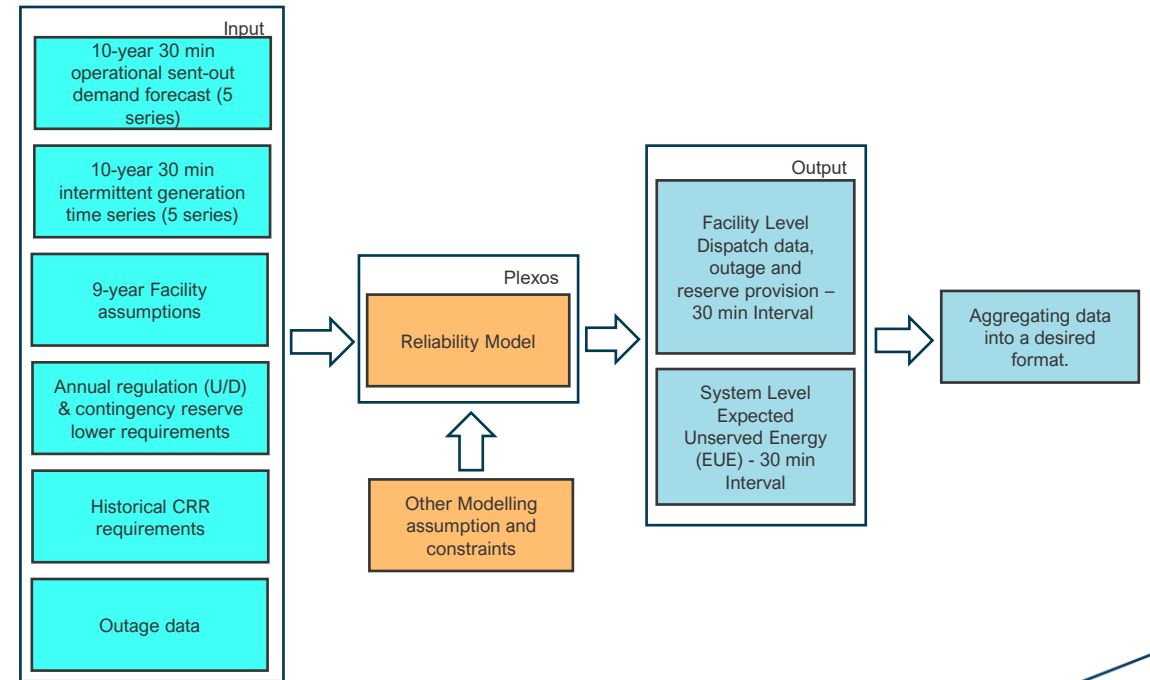
## Modelling methodology (Source: AEMO)

AEMO have conducted modelling to forecast the conditions under which ESR dispatch will be required over the next 9 years:

The AEMO model:

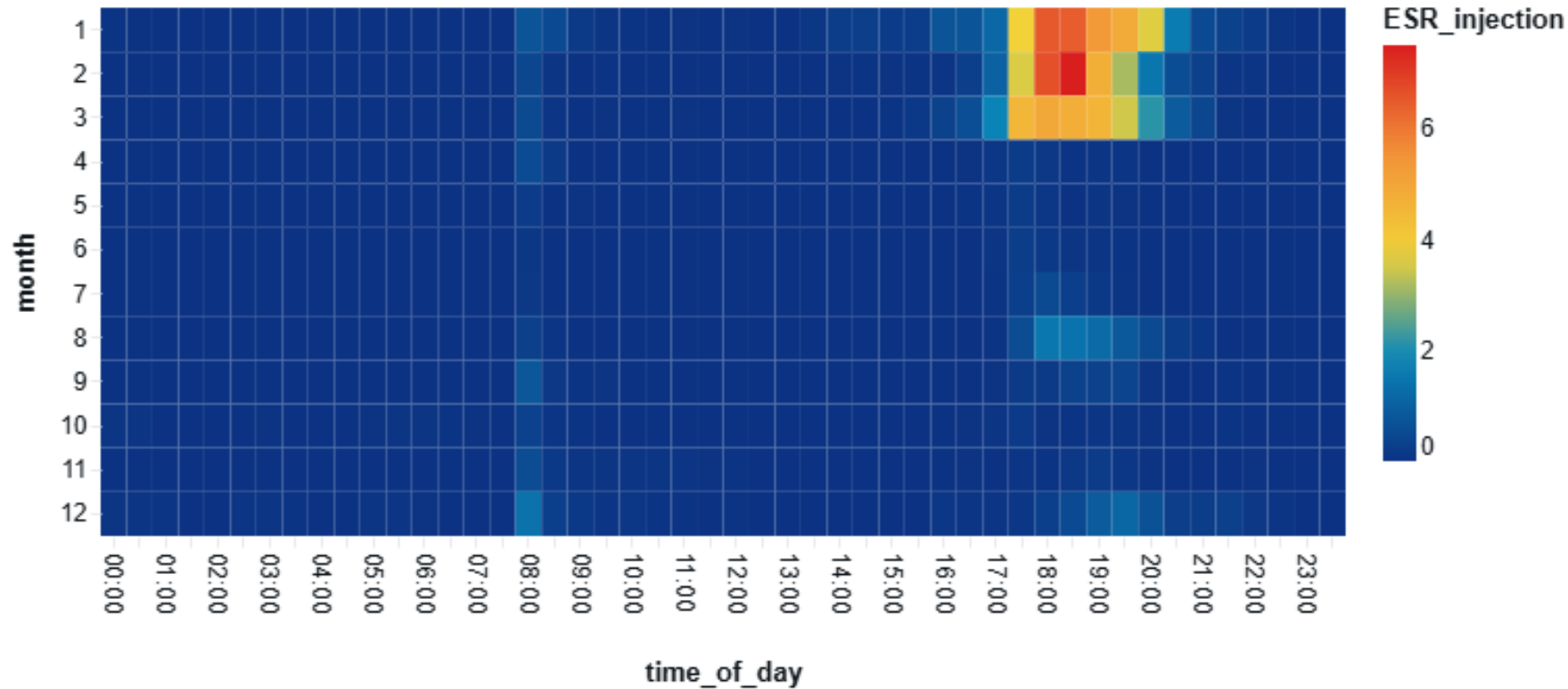
- Considers 5 reference years for ½ hourly demand shape and intermittent availability
- Models 20 outage scenarios to consider impacts to unserved energy
- Allows ESR to be dispatched up to its Capacity Credits with perfect foresight to optimally avoid unserved energy (i.e. ignores ESROI)
- Pushes ESR to the top of the merit order (ahead of DSP) to ensure ESR operates only during events which would otherwise cause unserved energy.

Modelled behaviour of ESR will be interrogated to understand conditions in which ESR discharge is required.



# Future-State Technical Analysis - Results

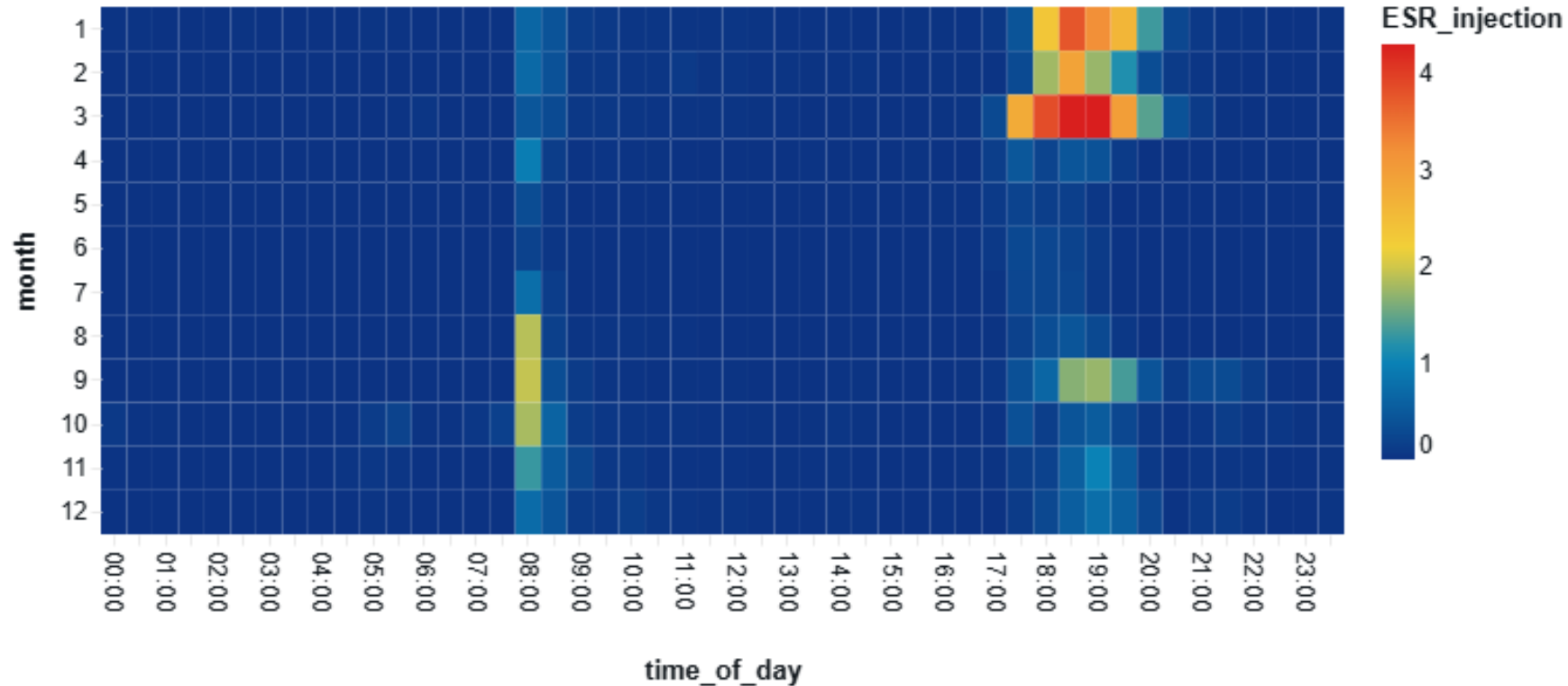
## Month and Time of Day when ESR injection is required - 2026



**Commentary:** Consistent with current state analysis, in 2026, the need for ESR support is concentrated in summer around the evening peak

# Future-State Technical Analysis - Results

## Month and Time of Day when ESR injection is required - 2028



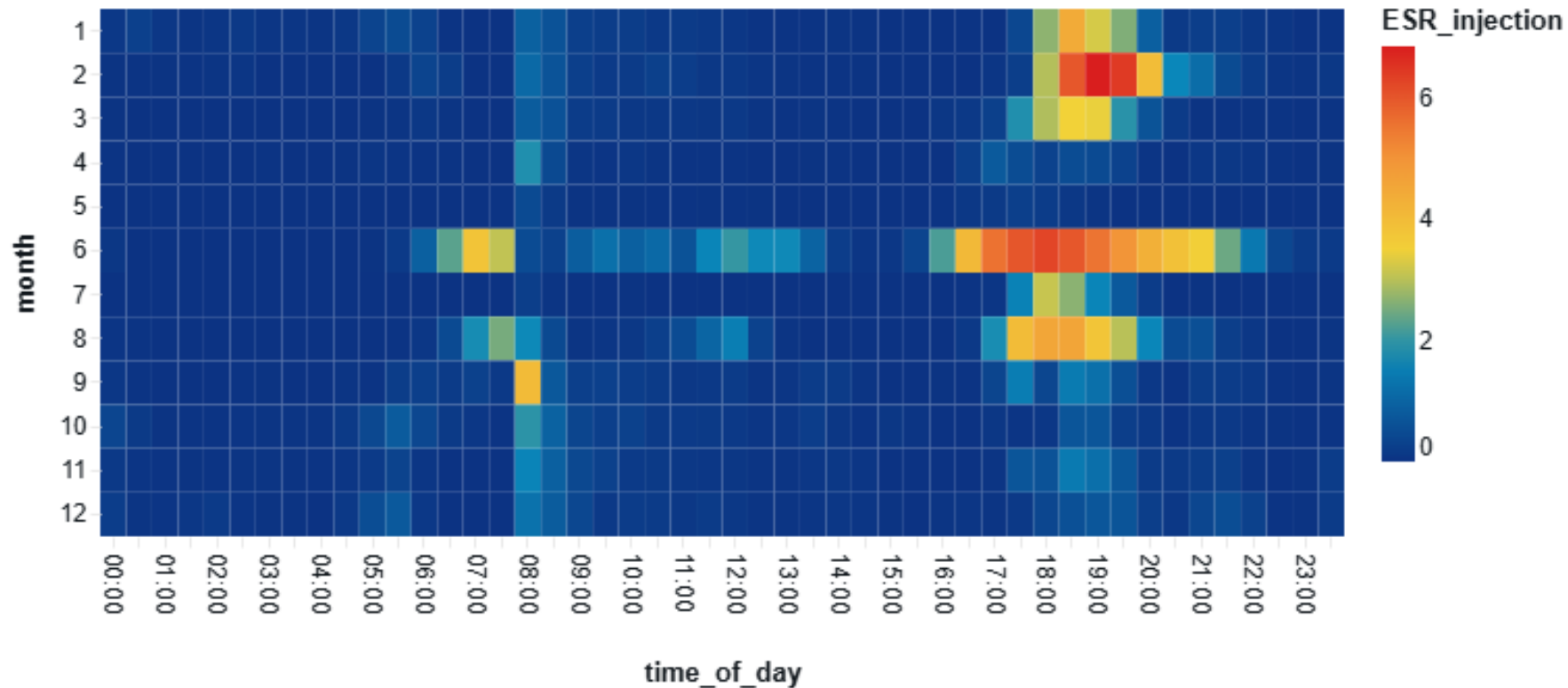
### Commentary:

By 2028, ESR support is needed in spring and in the morning as well as the evening peak.

This is an indication of the morning becoming an issue and one ESROI may not capture both morning and peak.

# Future-State Technical Analysis - Results

## Month and Time of Day when ESR injection is required - 2030

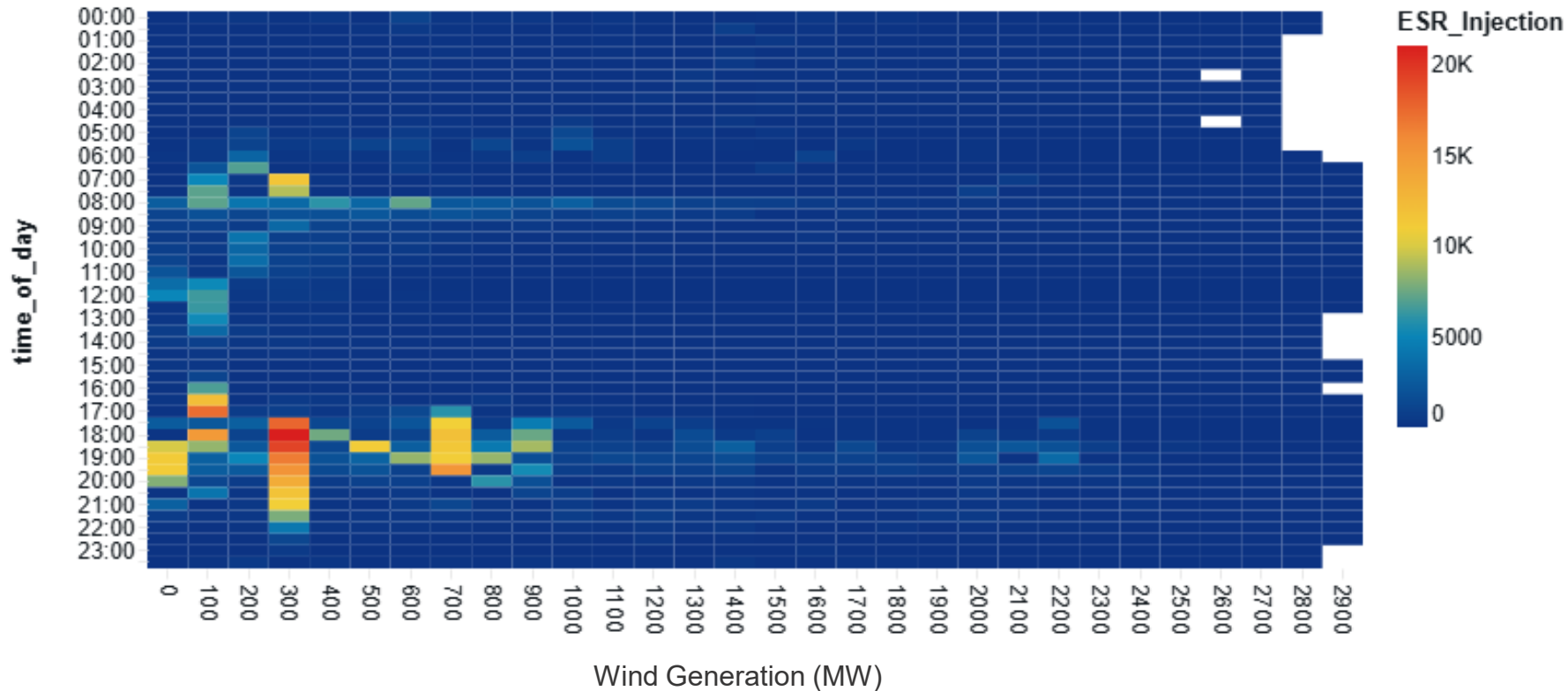


### Commentary:

By 2030, ESR support is needed in winter and in the morning as well as the evening peak. Winter ESROI will need to cover a longer time period than in summer.

# Future-State Technical Analysis - Results

## ESR Injection vs. Wind Generation (2030)



### Commentary:

Need for ESR support is concentrated in periods of low wind generation.

Potentially, state of charge requirements could be made conditional on low wind forecasts, if forecasts are sufficiently reliable.

Solar generation is a less reliable indicator of the need for ESR support.

# Future-State Technical Analysis - implications

## Conclusions from future-state analysis

- The times of day that the system requires ESR support vary by time of year
- These patterns will vary significantly over the coming years as the system transitions to more variable intermittent generation
- ESROI periods will have to adapt accordingly
- Potentially, state of charge requirements could be made conditional on low wind forecasts, if forecasts are sufficiently reliable.
- **Question for Working Group:** Should AEMO have the discretion to require a State of Charge that is lower than 100% in certain circumstances?

# Technical Analysis

Implications for policy

# Technical Analysis - implications

## Issue 1: Some SSEs start before the ESROIs even with the 6-hour ESROD

### Current and future state analysis confirms that ESR may be needed outside current evening ESROD

- Future state modelling indicates ESRs will be needed during spring and winter mornings.
- ESROIs will vary by time of year – timing of ESR need will become more dynamic as system transitions to renewables

### AEMO is empowered to shift ESROIs on the day before the Trading Day (ESMR 6.3.1)

- However, operational challenges exist as there is a lag between the determination and the trading day that allows for the variables to change.
  - If near-real-time/ day-ahead changes cannot be made to the ESROIs, then triggers for mandatory SOC obligations become important
  - Future state analysis indicates low wind forecasts could be a potential trigger – but this relies on accuracy and reliability of the forecasts.
  - **Question for Working Group:** How could wind forecasts be utilised to define a SOC obligation for ESR?
- AEMO advised that it is implementing seasonal/dynamic ESROIs for future capacity years.

# Current-State Technical Analysis - implications

## Issue 2: Existing refund regime will not incentivise ESRs entering ESROs with full charge

### Existing refund regime alone will not incentivise ESRs entering ESROs with full charge as high energy prices earlier in the day likely result in energy revenue greater than refunds payable

- Changing the existing refund regime (e.g. by changing the Dynamic Refund Factor (DRF)) affects all technologies (not just ESR)
  - Could result in offer price distortion as participants try to manage refund exposure
  - Could also result in refunds reaching annual cap quicker before Hot Season ends – incentive disappears for ESRs to be available after this.
- **Mandatory state of charge obligations is preferable\*\***
  - Want compliance by design – Civil Penalty provisions may not be enough of a deterrent to noncompliance with new obligations
  - An option is to create an additional refund/penalty mechanism that only applies to ESRs if AEMO has invoked its power to mandate state of charge levels before entering the Peak ESROD.
  - Refund/penalty operates in addition to existing refund regime (which will remain unchanged).

*\*\*Preliminary Future-State modelling indicates that triggers could be linked to wind forecasts subject to forecast accuracy.*

# Current-State Technical Analysis - implications

## Example of additional refund/penalty mechanism

- Mechanism is completely separate to existing Reserve Capacity Refund regime under section 4.26 of the ESM Rules
- Mechanism would only operate where AEMO has declared mandatory State of Charge (SOC) obligations to apply when entering the Peak ESROD.
- SOC refund would be the product of:
  - Charge Shortfall Proportion:  $1 - \frac{SOC \text{ at start of Peak ESROD}}{RCOQ \times ESROD}$
  - Capacity payments over the Peak ESROD in the absence of refunds (RCOQ x Trading Interval RCP x ESROD x 2)
- This additional refund does not count towards annual cap on Reserve Capacity refunds

# Current-State Technical Analysis - implications

## Example of additional refund/penalty mechanism

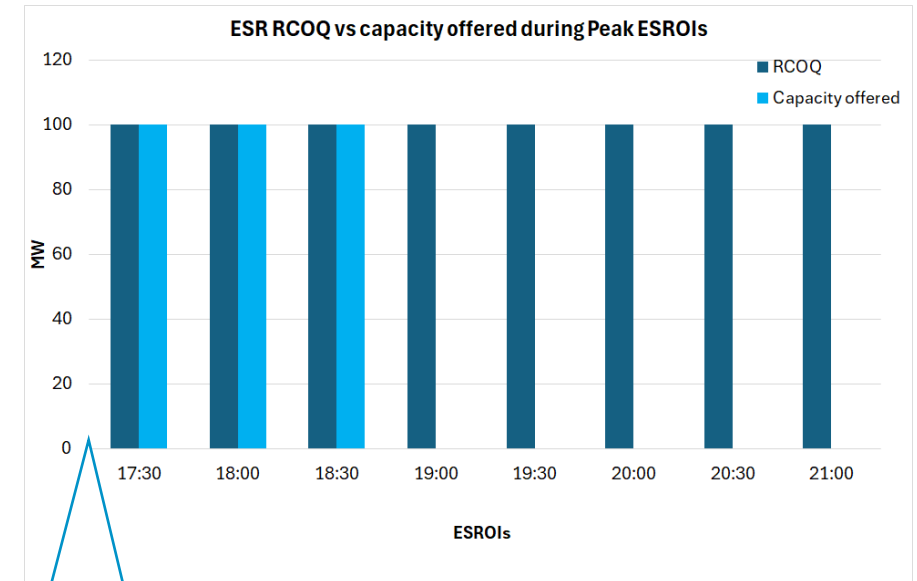
In this example it was assumed:

- An ESR with Peak RCOQ of 100MW and a Peak ESROD of 4 hours. (ESROIs: 17:30 – 21:00)
- The ESR has a Trading Interval Reserve Capacity Price of \$125/MW/Trading Interval.
- AEMO has mandated that all ESR with Reserve Capacity (RC) obligations must enter their Peak ESROD with full charge.
- All ESROIs have Spare Capacity  $\leq 750\text{MW}$  (so DRF = 6)
- The ESR enters the Peak ESROD with 150MWh SOC (it needs 400MWh SOC to deliver its RCOQ across the ESROIs)
- The ESR offers its RCOQ for the first three ESROIs (18 Dispatch Intervals) after which it runs out of charge and offers 0.

# Current-State Technical Analysis - implications

## Example of additional refund/penalty mechanism – how would SOC refund work?

- Determine the charge shortfall proportion at the start of the Peak ESROD
  - ESR needed 400MWh but entered ESROD with 150MWh.
  - Charge shortfall proportion is  $1 - \frac{SOC \text{ at start of Peak ESROD}}{RCOQ \times ESROD} = 1 - \frac{150MWh}{400MWh} = 62.5\%$
- Determine Capacity Payments to ESR had they delivered RCOQ over the ESROD:
  - ESR would have received  $\$125/MW/ESROI \times 100MW = \$12,500$  per ESROI
  - Total revenue would have been  $\$12,500 \times 4$  (ESROD)  $\times 2 = \$100,000$ .
  - SOC refund =  $\$100,000 \times 62.5\% = \$62,500$ .
- ESR pays:
  - RC refunds of  $\$75,000 \times 5 = \mathbf{\$375,000}$  plus
  - SOC refund of  $\mathbf{\$62,500}$  (does not count towards annual refund cap).
    - ESR would have paid the \$62,500 even if it had reduced its RC refund exposure by charging early in the ESROD to avoid refunds during the Mid-Peak ESROI.
    - SOC refund could be multiplied further by the Dynamic Refund Factor but using the average Spare Capacity during the ESROIs, but this may be overly punitive.



Additional SOC refund of \$62,500 payable due to insufficient charge at start of ESROD

RC refunds of 6 x \$125 x 100 MW = \$75,000 per ESROI between 19:00 – 21:00

# Current-State Technical Analysis - implications

## Additional refund/penalty mechanism - discussion

Does the CC2TRWG have any comments on the proposed additional SOC refund?

Does the CC2TRWG have any comments on the example SOC refund?

# Annex 1

## Abbreviations

# Abbreviations not previously introduced

Term	Definition
ADG	Availability Duration Gap
CC1	Capability Class 1
CC2	Capability Class 2
CC3	Capability Class 3
DPV	Distributed Photovoltaics
ESMR	Electricity System and Market Rules
ESR	Electric Storage Resource
ESROD	Electricity Storage Resource Obligation Duration
EUE	Expected Unserved Energy
MW	Megawatt
MWh	Megawatt - Hour
RCOQ	Reserve Capacity Obligation Quantity
RCP	Reserve Capacity Price
RoCoF	Rate of Change of Frequency

