

Electric Storage Resource Obligation Intervals for 2023-24 Capacity Year

A 2021 Wholesale Electricity Market Electricity Statement of Opportunities supplementary publication

This supplementary publication serves to outline the Electric Storage Resource Obligation Intervals (ESROI) for each Trading Day for the 2023-24 Capacity Year and provide analysis of forecast ESROI. AEMO has determined that the ESROI will not require any seasonal variation. The ESROI for the 2023-24 Capacity Year will be 16:30 to 20:00 Trading Intervals in each Trading Day.

This publication is supplementary to the *2021 Wholesale Electricity Market (WEM) Electricity Statement of Opportunities (ESOO)*¹. Analysis within this publication to determine the Peak Demand Period, and subsequently the ESROI, draws on the 2021 WEM ESOO demand forecasts. The analysis has a focus on the peak demand timing over the outlook period covering the 2021-22 to 2030-31 Capacity Years.

1. Determination of Peak Demand Period² for 2023-24 Capacity Year

Peak Demand Period

AEMO applied the peak demand forecasts developed for the 2021 Long Term Projected Assessment of System Adequacy (PASA) to determine the Peak Demand Period for the 2023-24 Capacity Year for the Summer, Shoulder and Winter Seasons³ based on two modelled scenarios⁴:

- Median peak demand assuming expected demand growth, referred to as the 50% probability of exceedance (POE)⁵ peak demand.
- One in 10-year peak demand assuming expected demand growth, referred to as the 10% POE peak demand.

The set of modelled peak demand simulations from the 2021 WEM ESOO produced a distribution of outcomes such that peak demand timing⁶ is represented as a range of Trading Intervals, as discussed below.

Figure 1 and Figure 2 show the timing of 50% POE peak and 10% POE peak demand distribution respectively. Table 1 shows the Trading Intervals in which peak demand is likely to occur for the 50% and 10% POE based on the expected demand growth scenario modelled for each Season in the 2023-24 Capacity Year⁷, which are applied to define the Peak Demand Periods for the three Seasons.

Table 1 Trading Intervals in which peak demand is likely to occur for 50% POE and 10% POE Peak Demand, 2023-24 Capacity Year, Expected Demand Growth scenario, and Peak Demand Period

POE	Summer	Winter	Shoulder
50%	17:00-19:30	18:00-19:00	17:30-19:00
10%	18:00-18:30 ⁸	18:00-19:00	17:00-18:00
Peak Demand Period	17:00-19:30	18:00-19:00	17:00-19:00

¹ At https://www.aemo.com.au/-/media/files/electricity/wem/planning_and_forecasting/esoo/2021/2021-wholesale-electricity-market-electricity-statement-of-opportunities.pdf.

² Refer to definitions defined in Table 1 of the WEM Procedure: Electric Storage Resource Obligation Intervals, at <https://aemo.com.au/-/media/files/electricity/wem/procedures/electric-storage-resource-obligation-intervals-wem-procedure.pdf?la=en&hash=8E9889DD3FE4544D92B129E8B07FDEE5>.

³ The seasons are defined in three seasons: Summer (Trading Months December – March), Winter (Trading Months June – August), and the Shoulder Season, which includes all other Trading Months.

⁴ Refer to paragraph 2.1.3 of the WEM Procedure: Electric Storage Resource Obligation Intervals.

⁵ POE means the likelihood that a peak demand forecast will be met or exceeded. A 10% POE peak demand forecast is expected to be exceeded, on average, only one year in 10, while 50% POE peak demand forecasts are expected to be exceeded, on average, five years in 10.

⁶ The peak demand timing results presented in this report are consistent with the modelling results reported in 2021 WEM ESOO.

⁷ A minimum of 10% probability threshold is applied to define the Trading Intervals in which peak demand is likely to occur.

⁸ The Trading Intervals for occurrence are consistent with the timing of annual peak demand for 2020-21. The peak demand day for 2020-21 was 8 January 2021 and peak demand of 3,789 MW was observed at Trading Interval commencing 18:00.

Figure 1 Probability of occurrence of 50% POE Peak Demand timing, 2023-24 Capacity Year, Expected Demand Growth scenario

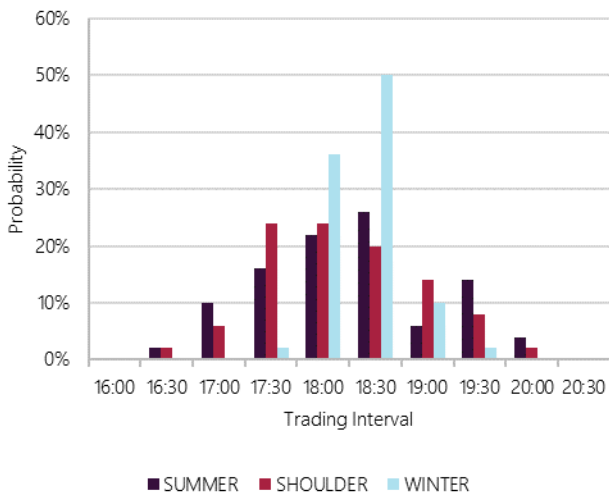
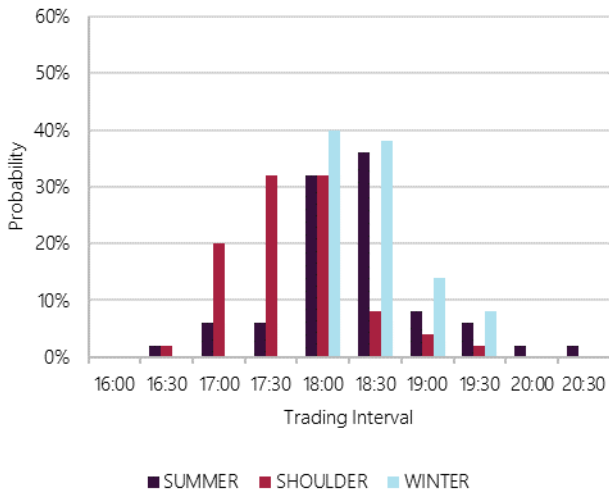


Figure 2 Probability of occurrence of 10% POE Peak Demand timing, 2023-24 Capacity Year, Expected Demand Growth scenario



2. Determination of ESROI for 2023-24 Capacity Year

The ESROI is required to be eight contiguous Trading Intervals⁹. Based on analysis of Peak Demand Periods, AEMO has determined ESROI for the 2023-24 Capacity Year to:

- Commence at Trading Interval 16:30 and conclude at Trading Interval 20:00 for each Trading Day

AEMO considers the ESROI spanning from Trading Intervals 16:30 to 20:00, of which the Peak Demand Periods are subsets, would provide sufficient coverage across all Seasons, and therefore considers it unnecessary to seasonally vary the ESROI for the 2023-24 Capacity

Year. AEMO’s peak demand modelling shows that it is highly unlikely that either the 50% POE or the 10% POE peak demand will occur outside of the 16:30 to 20:00 ESROI among all Seasons¹⁰.

In determining the ESROI, AEMO has also considered the operational requirements of the SWIS. It was identified that the defined ESROI conforms well for Medium Term PASA, as ESR would be available during high demand periods. The ESROI are not operationally relevant for Short Term PASA, as it is performed on blocks of 6-hour periods of the day (as specified in WEM Rules) that are not lined up to capture the natural peak times of the day.

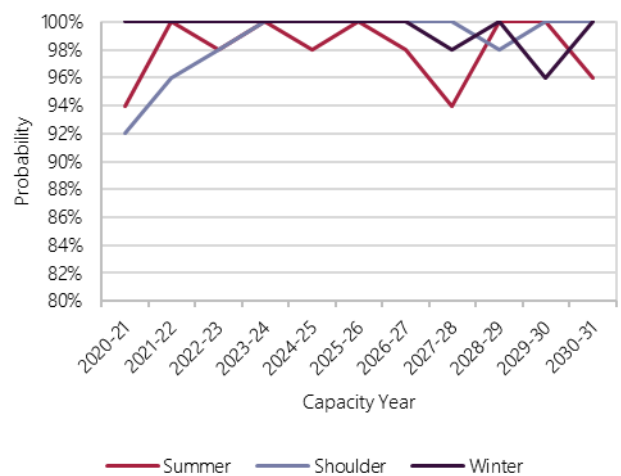
3. Forecast of future ESROI

The ESROI, consisting of Trading Intervals 16:30 to 20:00, are applied to examine the coverage¹¹ across the outlook period for the 50% and 10% POE forecasts, as shown in Figure 3 and Figure 4 respectively. While these ESROI were initially determined to maximise the coverage of the Peak Demand Period in the 2023-24 Capacity Year, it also captures at least 90% of probability of occurrence across the 10-year outlook period for both forecasts.

The probability of coverage improves between 2020-21 and 2023-24. This could be explained by the forecast of increased uptake of behind-the-meter photovoltaics (PV) that increases the probability of peak demand timing occurring later in the day after 16:30 (start time of ESROI) from 2020-21 to 2023-24.

AEMO acknowledges that because the model is stochastic, there is a small amount of variability in outcomes as seen in the second half of the outlook period.

Figure 3 Probability of coverage of Trading Intervals 16:30 to 20:00 across Outlook Period for 50% POE Peak Demand

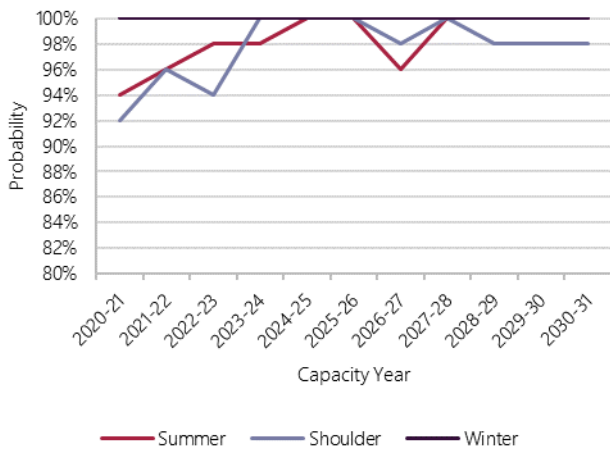


⁹ See definition of Electric Storage Resource Obligation Duration under the WEM Rules.

¹⁰ Based on the peak demand simulations, only 2% of the 10% POE Summer peaks and none of the 50% POE Summer peaks occurred outside these ESROI.

¹¹ Coverage is defined as the probability of occurrence of peak demand in these Trading Intervals.

Figure 4 Probability of coverage of Trading Intervals 16:30 to 20:00 across Outlook Period for 10% POE Peak Demand



Future analysis

AEMO welcomes stakeholders’ feedback on this analysis (wa.capacity@aemo.com.au).

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