



29 June 2022

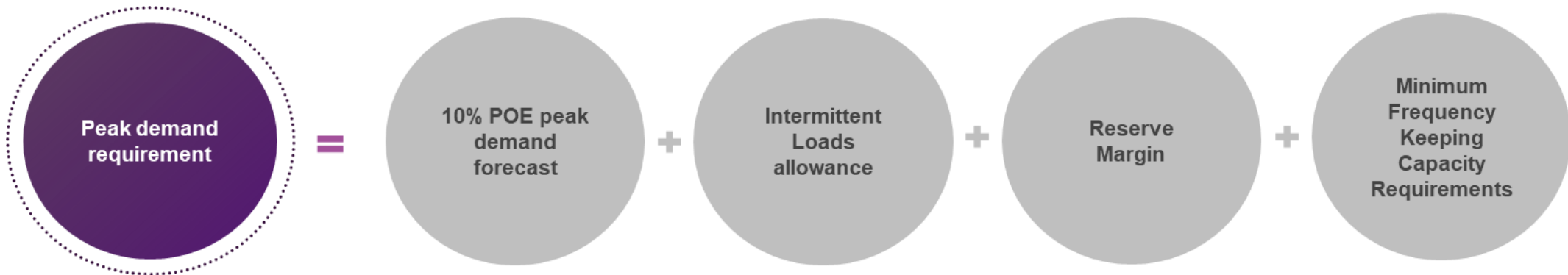


Agenda

- Background
- Key findings
- Supply-demand balance
- Details around findings
 - 2021-22 summer peak demand
 - Peak demand and consumption outlook
 - Minimum demand outlook
 - Distributed energy resources (DER) forecasts
- Questions

Background

- The 2022 WEM ESOO sets the Reserve Capacity Requirement (RCR) for the 2022 Reserve Capacity Cycle based on the Long Term Projected Assessment of System Adequacy (PASA) (for the 2022-23 to 2031-32 Capacity Years).
- The Long Term PASA study ensures sufficient capacity is available in the South West Interconnected System (SWIS) to meet the greater of:
 - Peak demand capacity requirement:



- Expected unserved energy (EUE) capacity requirement: annual EUE \leq 0.002% of annual energy consumption.

Summary of findings*

The RCR for 2024-25 = 4,526 MW

Sufficient capacity is projected to be available to meet forecast capacity requirements until 2024-25. Shortfalls are projected from 2025-26, assuming no new capacity becomes committed.

10% POE peak demand forecast to grow faster, at an average annual rate of 0.9% compared to 0.2% in the 2021 WEM ESOO.

Operational consumption forecast to fall slower at an average annual rate of 0.3% compared to a 0.8% decline in the 2021 WEM ESOO.

Minimum demand, if left unconstrained, is expected to decline from 765 MW** to 11 MW by 2026-27, due to continued uptake in DPV installations, forecast to reach an estimated 4,716 MW in 2031-32.

The recently announced retirements of the Collie and Muja D power stations or planned investment by Government in new wind and storage have not been modelled in the 2022 WEM ESOO – these will be considered in future ESOOs.

**All data in the 2022 WEM ESOO and this presentation is based on Capacity Years unless otherwise specified. A Capacity Year commences in the Trading Interval starting at 08:00 on 1 October and ends in the Trading Interval ending at 08:00 on 1 October of the following calendar year.*

*** Measured by the non-loss adjusted Total Sent Out Generation on 14 November 2021. The 761 MW value reported in the Quarterly Energy Dynamics – Q4 2021 Report is based on non-loss adjusted sent out SCADA data.*

Supply-demand Balance

- Excess capacity is forecast to decrease from 331 MW (7.5%) in 2023-24 to 8 MW (0.2%) in 2024-25*.
- From 2025-26, the forecast capacity requirement is expected to exceed available capacity and the capacity shortfall is forecast to increase from 21 MW (0.5%) in 2025-26 to 303 MW (6.3%) by 2031-32*.
- There is an opportunity for new capacity to participate in the RCM to ensure these forecast capacity shortfalls do not eventuate.
- AEMO is currently collating submissions received as part of the Expressions of Interest process for the 2022 Reserve Capacity Cycle, a summary of which will be published by 30 June 2022.
- Changes to the RCM resulting from the RCM Review may change the supply-demand balance outlook.

*The capacity values for 2024-25 and remaining years are forecasts, assuming the quantity of Capacity Credits assigned for 2023-24 remain unchanged other than the retirement of Muja C unit 6 from 2024-25. This does not consider the WA Government recently announced plans to retire Synergy's remaining coal-fired generators, namely the Collie Power Station (317.2 MW Capacity Credits) and Muja D Power Station (418.2 MW of Capacity Credits), by 2030.

Scenarios

- The 2022 WEM ESOO considers three demand growth scenarios, consistent with WEM Rules 4.5.10(a) and uses a selection of scenarios, assumptions, and supporting forecasts from AEMO's *Inputs, Assumptions and Scenarios Report* (IASR) published in July 2021.

2022 WEM ESOO scenario	Low	Expected	High
2021 IASR scenario mapping^A	Slow Change <i>Includes lower assumed forecast economic growth than the historical trend, reflects slower technology advancement, and slower decarbonisation progress</i>	Progressive Change <i>reflects a moderate economic growth and a future energy system based on the current state and federal govt and environmental and energy policy, including transitioning to an economy-wide net zero emission by 2050.</i>	Strong Electrification <i>features strong economic activity, high electrification levels and energy efficiency investments, achieving an economy-wide net zero emission by early 2040s.</i>
Economic and population growth forecasts	Low	Expected	High
Energy efficiency	Low	Expected	High
DER	Low	Expected	High
Decarbonisation target^B	26-28% reduction by 2030 No explicit decarbonisation target beyond 2030	26-28% reduction by 2030 Economy-wide net zero target by 2050	Exceed 26-28% reduction by 2030 Economy-wide net zero by early 2040s

A. See report at <https://aemo.com.au/-/media/files/major-publications/isp/2021/2021-inputs-assumptions-and-scenarios-report.pdf?la=en> and addendum at <https://aemo.com.au/-/media/files/major-publications/isp/2022/addendum-to-the-2021-inputs-assumptions-and-scenarios-report.pdf?la=en>.

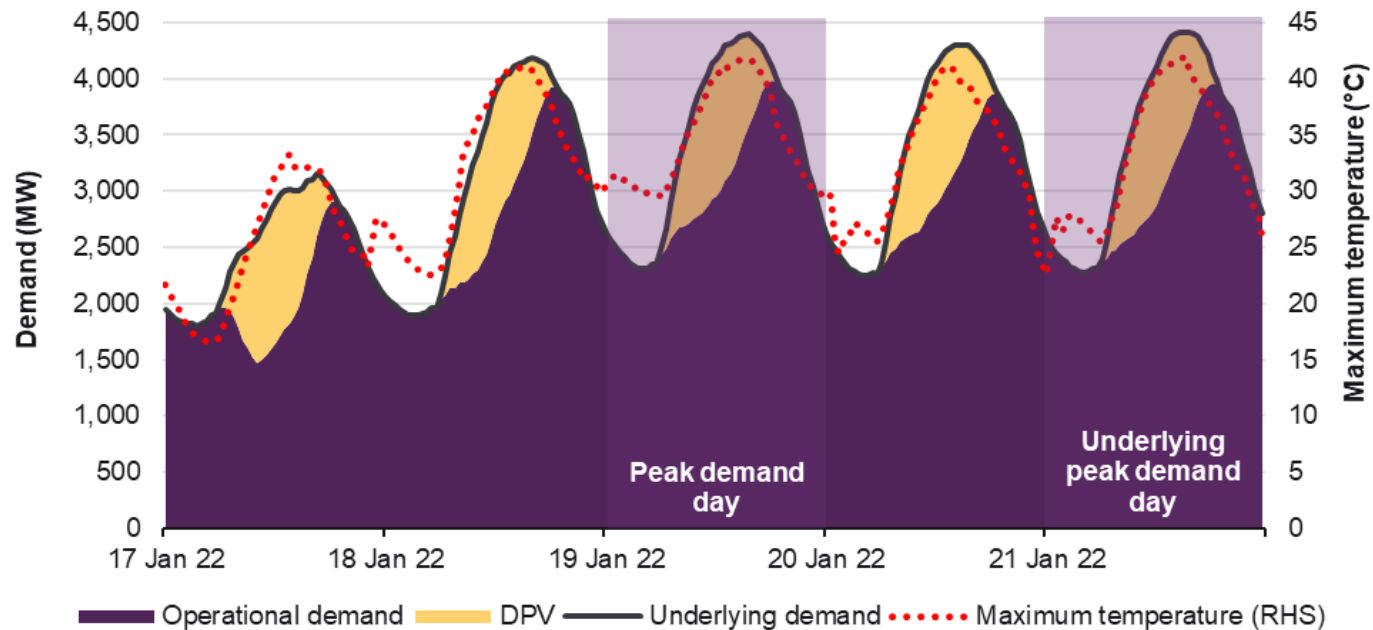
B. While the implications of the long-term carbon emission reduction policy were considered in shaping the forecasts, the forecasts are limited to the 10-year outlook period for this WEM ESOO.

Details around findings

2021-22 peak demand

- The hottest summer on record across the Greater Perth region.

Date	Daily maximum operational demand		Daily maximum underlying demand		Temperature (°C)			Peak demand reduction from DPV (MW)	Peak demand reduction from peak time shift (MW)
	Trading Interval	MW	Trading Interval	MW	Daily maximum	Moving average	Overnight minimum		
19 January 2022	18:00	3,984	15:30	4,393	41.8	38.7	29.7	122	287
21 January 2022	18:00	3,953	15:30	4,411	42.0	41.7	22.6	124	335
8 January 2021	18:00	3,789	14:00	4,170	41.5	38.8	21.9	81	300



Compared to the 2020-21 summer, in the 2021-22 summer:

- The peak was 195 MW (5%) higher, primarily driven by two consecutive days with maximum ambient temperatures above 41°C and high overnight temperatures.
- The underlying peak demand was 241 MW (6%) higher, resulting from 4 consecutive days in a row with daily maximum temperatures exceeding 41°C.

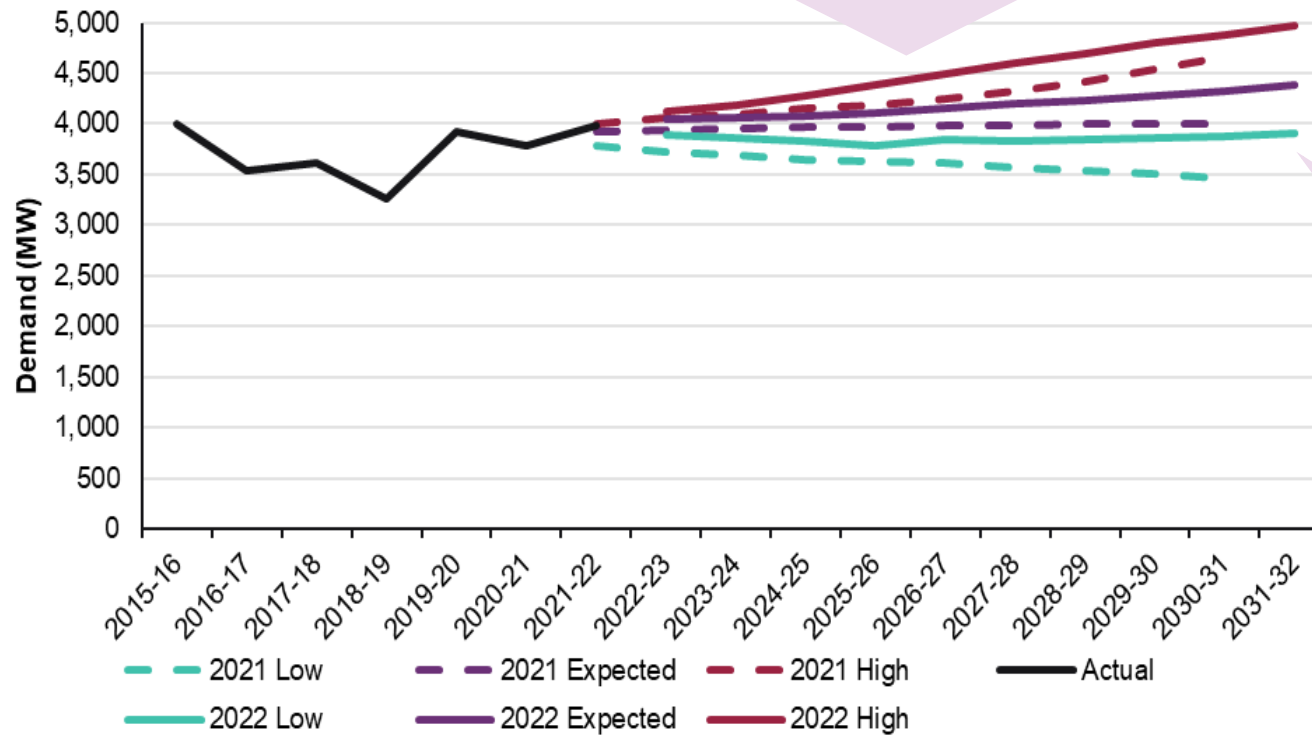
10% POE operational peak demand outlook - All scenarios

Higher demand than 2021 WEM ESOO forecast due to stronger growth in residential load and large industrial loads (LIL). High 2021-22 summer peak demand also raised the starting point of the demand forecasts.

High scenario is forecast to increase at an average annual rate of 2.1%, largely driven by strong growth in the uptake of EVs, residential customer, and LIL demand.

Expected scenario is forecast to increase at an average annual rate of 0.9%, largely driven by the growth in LIL demand in the short-term and increase in demand from residential customers and EVs in the long-term.

Low scenario is forecast to remain stable, growth in demand from LIL and EVs is offset by the DPV generation and energy discharged from battery storage during peak periods.



AEMO has determined the **Electric Storage Resource Obligation Intervals** are Trading Intervals commencing **16:30 to 20:00** in each Trading Day for the **2024-25** Capacity Year.

Operational consumption outlook

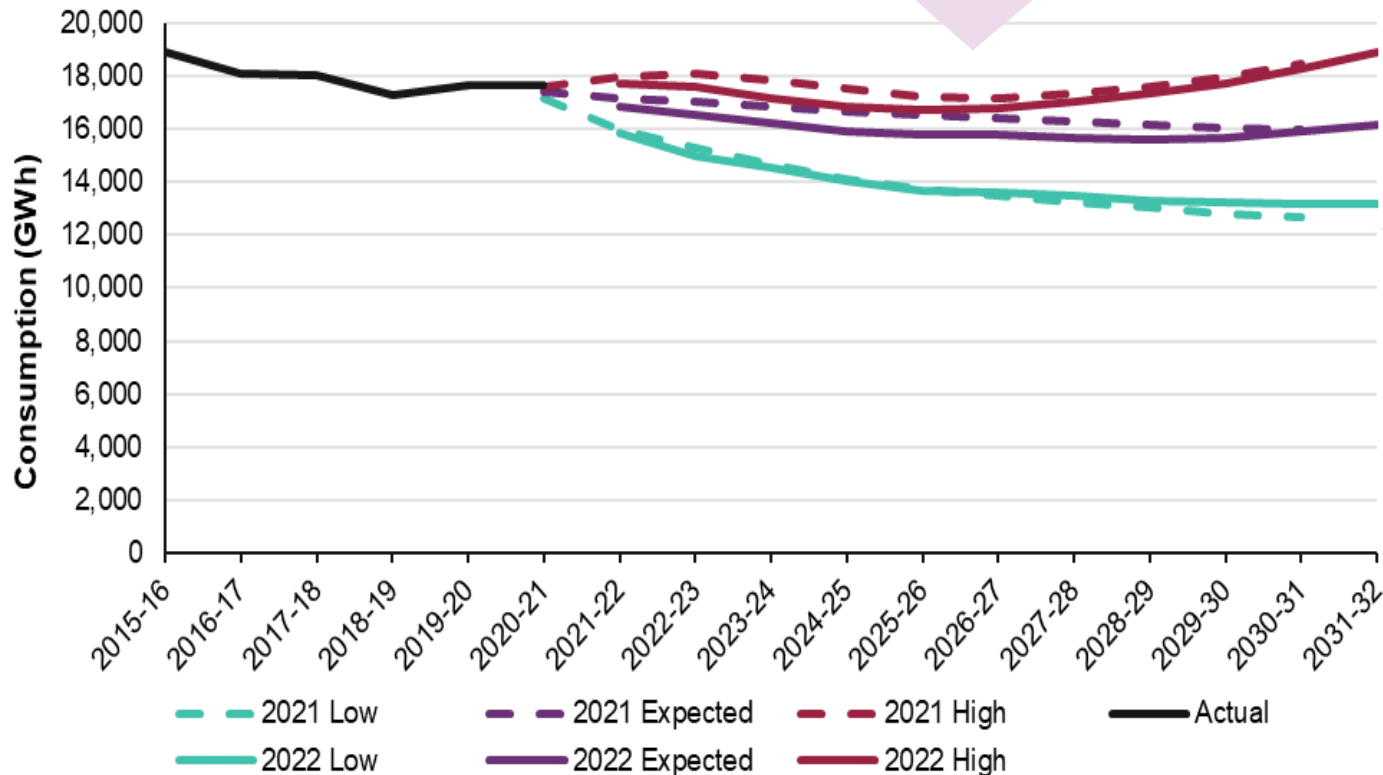
- All scenarios

Overall, compared to the 2021 WEM ESOO, the consumption forecasts are lower for the entire outlook period for the expected and high scenarios. Lower business (non-LIL) consumption is a common driver. Higher consumption for the low scenario for the last few years due to forecast higher residential consumption.

High scenario is forecast to increase at an average annual rate of 0.8%. Dip in the first half of the outlook period due to significant growth in DPV uptake, then driven up by higher business (non-LIL) and residential consumption

Expected scenario is forecast to decrease at an average annual rate of 0.3%. Slight rise in the second half of the outlook period is due to a forecast increase in LIL consumption and energy use by EVs.

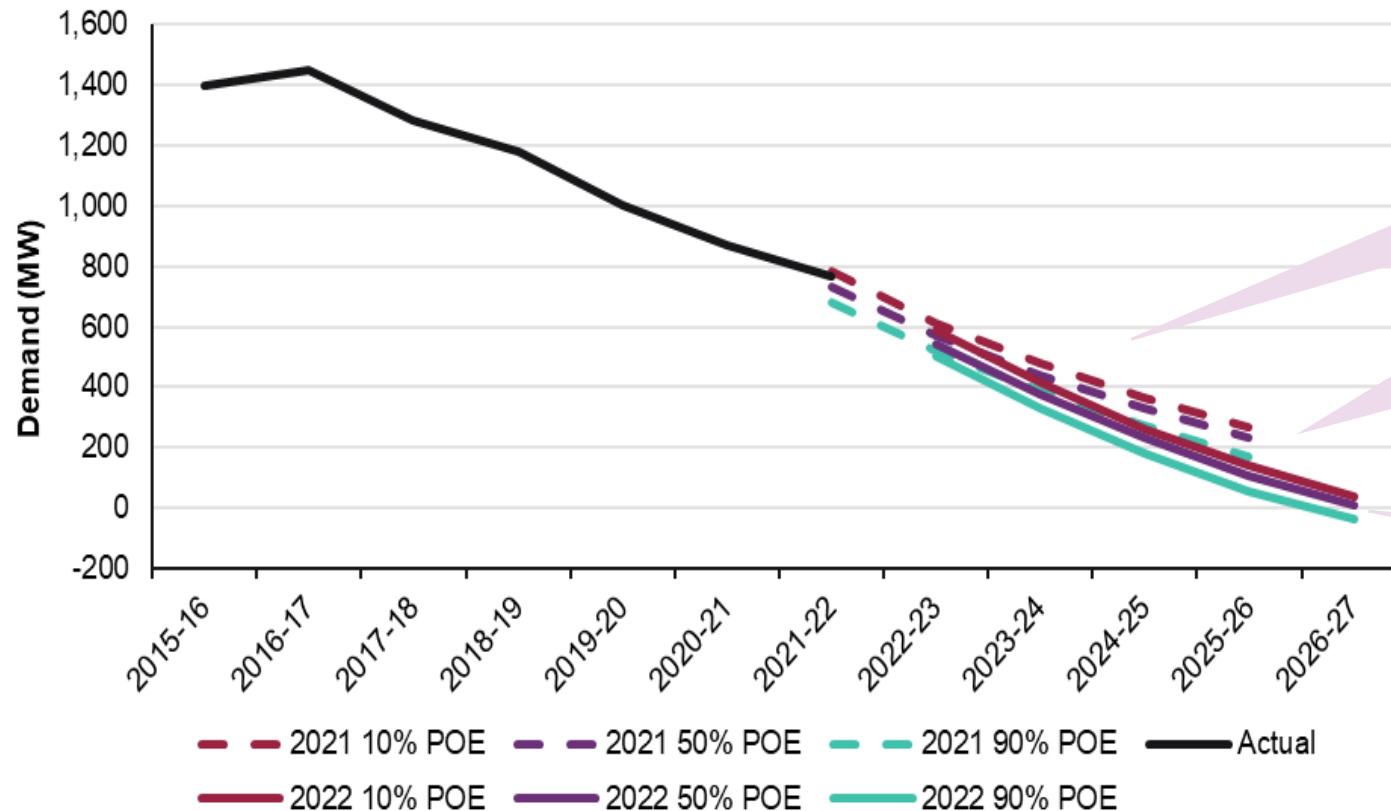
Low scenario is forecast to decline at an average annual rate of 1.4%, largely drive by forecast strong declines in business (non-LIL) and residential consumption.



Operational minimum demand outlook – Expected scenario

Typically, minimum demand occurs on a weekend, with clear sky conditions to maximise the output from DPV systems and mild temperatures (shoulder season, particularly from Sep to Dec) giving minimal heating or cooling loads.

Minimum demand forecast represents uncontrolled or unconstrained demand, free of market-based solutions that might increase or reduce operational demand.



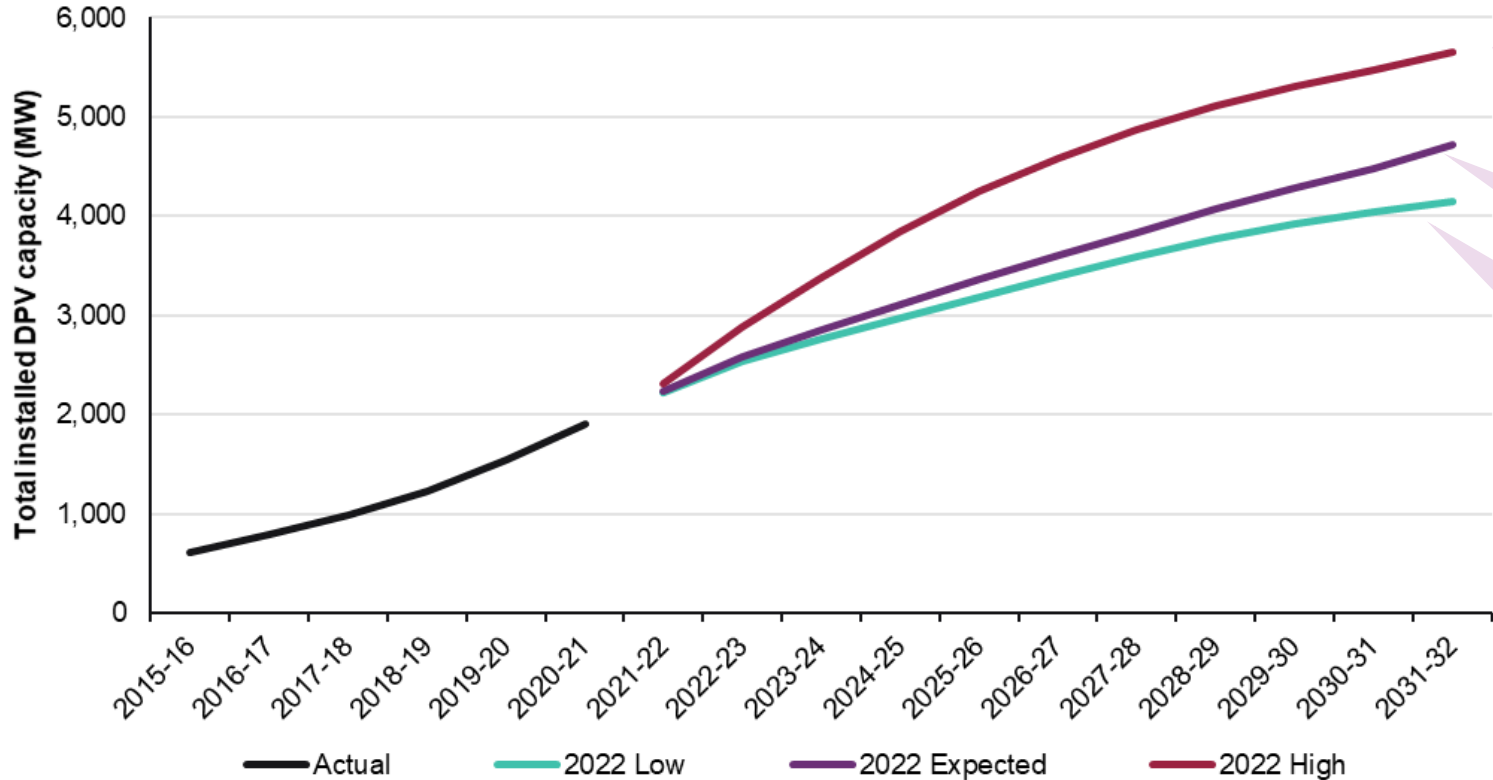
Compared to the 2021 WEM ESOO, faster decline in minimum demand due to higher DPV capacity forecast.

Over the outlook period, increasing DPV generation will push system demand to lower levels and record low levels will be reached more frequently.

The 50% POE minimum demand is forecast to decline rapidly from 546 MW in 2022-23 to 11 MW in 2026-27, at an average annual reduction rate of 62.1%.

- As minimum demand continues to decline, management of the SWIS will become increasingly challenging and highlights the need for market and operational intervention to ensure the system stays secure and stable.
- Mitigation actions are either in place or being investigated by AEMO to prevent minimum operational demand causing instability in the power system. These actions support the WA Government's Energy Transformation Strategy to enable the transition to more renewables, and greater decentralisation through higher DER.

DPV installed capacity forecast – All scenarios



High scenario is forecast to grow at an average annual rate of 7.8 % (308 MW), to reach 5,658 MW in 2031-32, up from 2,883 MW in 2022-23.

Expected scenario is forecast to grow at an average annual rate of 7.0% (238 MW), to reach 4,716 MW in 2031-32, up from 2,575 MW in 2022-23

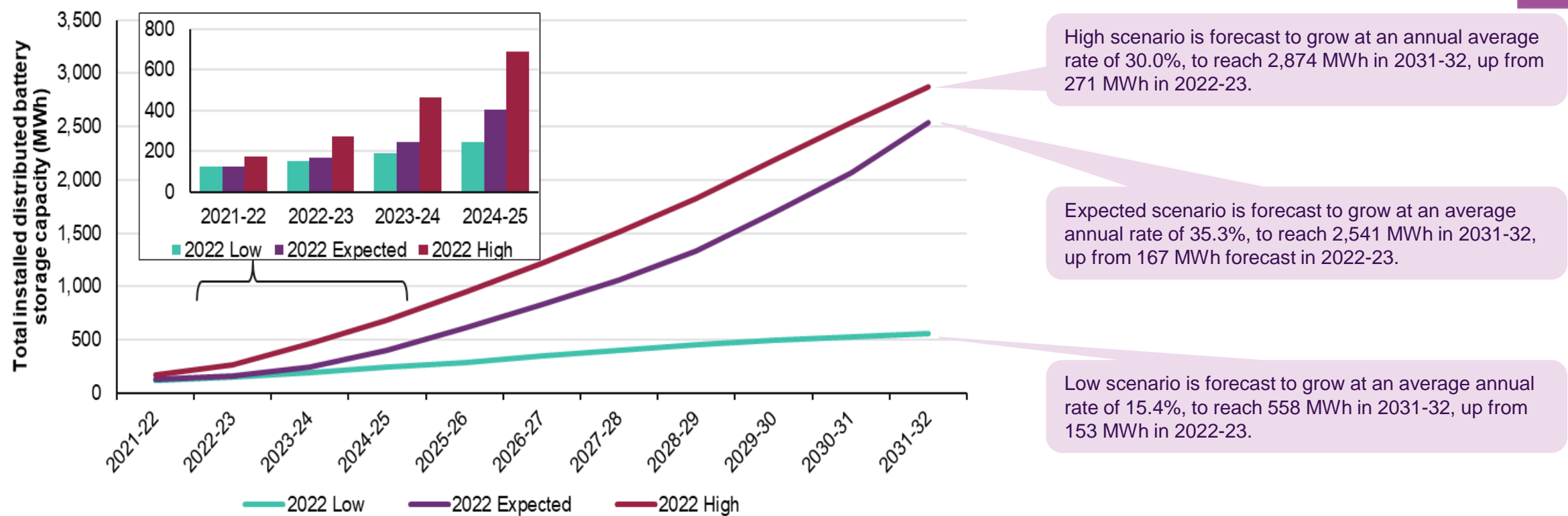
Low scenario is forecast to grow at an average annual rate of 5.6% (178 MW), to reach 4,143 MW in 2031-32, up from 2,542 MW in 2022-23.

A. The total installed DPV capacity represents the sum of rooftop PV and PVNSG installed capacity.

B. The DPV installed capacity for 2021-22 was based on the actual data as of March 2021 and AEMO's forecast for the period April to September 2022.

Sources: AEMO, CER, CSIRO, and GEM

Distributed battery storage installed capacity forecast – All scenarios



A. Cumulative installed capacity forecasts account for degradation of battery performance over time. Data includes degradation of distributed battery storage capacity.
Sources: CSIRO and GEM

Questions and feedback

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