

WA Electricity Consultative Forum

7 December 2022



We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

We pay respect to their Elders past, present and emerging.

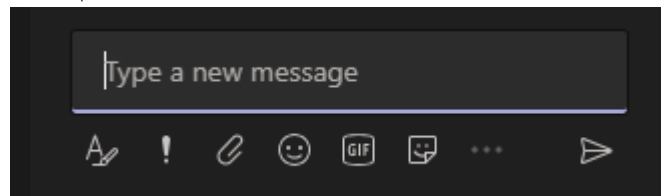
Join the Discussion and Teams



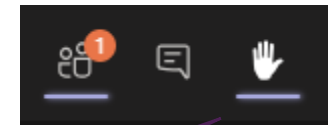
1. Click the chat icon to open the chat window

1. Click the hand icon to raise your hand

2. Type your question in the chat window



2. Keep your hand raised until you're called upon



3. Lower your hand after

Agenda

Item	Time	Item	Speaker
1.	1.00pm – 1.10pm	Welcome and Minutes – 12 October 2022	Chair
2.	1.10pm – 1.55pm	AEMO Operational Updates	
		2.1. Power System update	Michael Dalton (AEMO)
		2.2. Reserve Capacity update	Neetika Kapani (AEMO)
3.	1.55pm – 2.05pm	AEMO Project Updates	
		3.1 WEM Reform Program update	Andrew Smith (AEMO)
		3.2 AEMO WA DER Roadmap update	Tom Butler (AEMO)
4.	2.05pm – 2.35pm	2022: A Year in Review	AEMO
5.	2.35pm – 2.45pm	Overview and look ahead to 2023	Kate Ryan (AEMO)
6.	2.45pm – 2.55pm	Other Business	
7.	2.55pm	Next Meeting – 22 February 2023	Chair

*Please note that this meeting will be recorded by AEMO and may be accessed and used by AEMO for minute production purposes. By continuing, you consent to AEMO recording the call and using the recording for this purpose. If you do not consent, you may exit the meeting. No other recording of the meeting is permitted

Power System Update

December 2022 - April 2023

Presented to WA Electricity Consultative
Forum

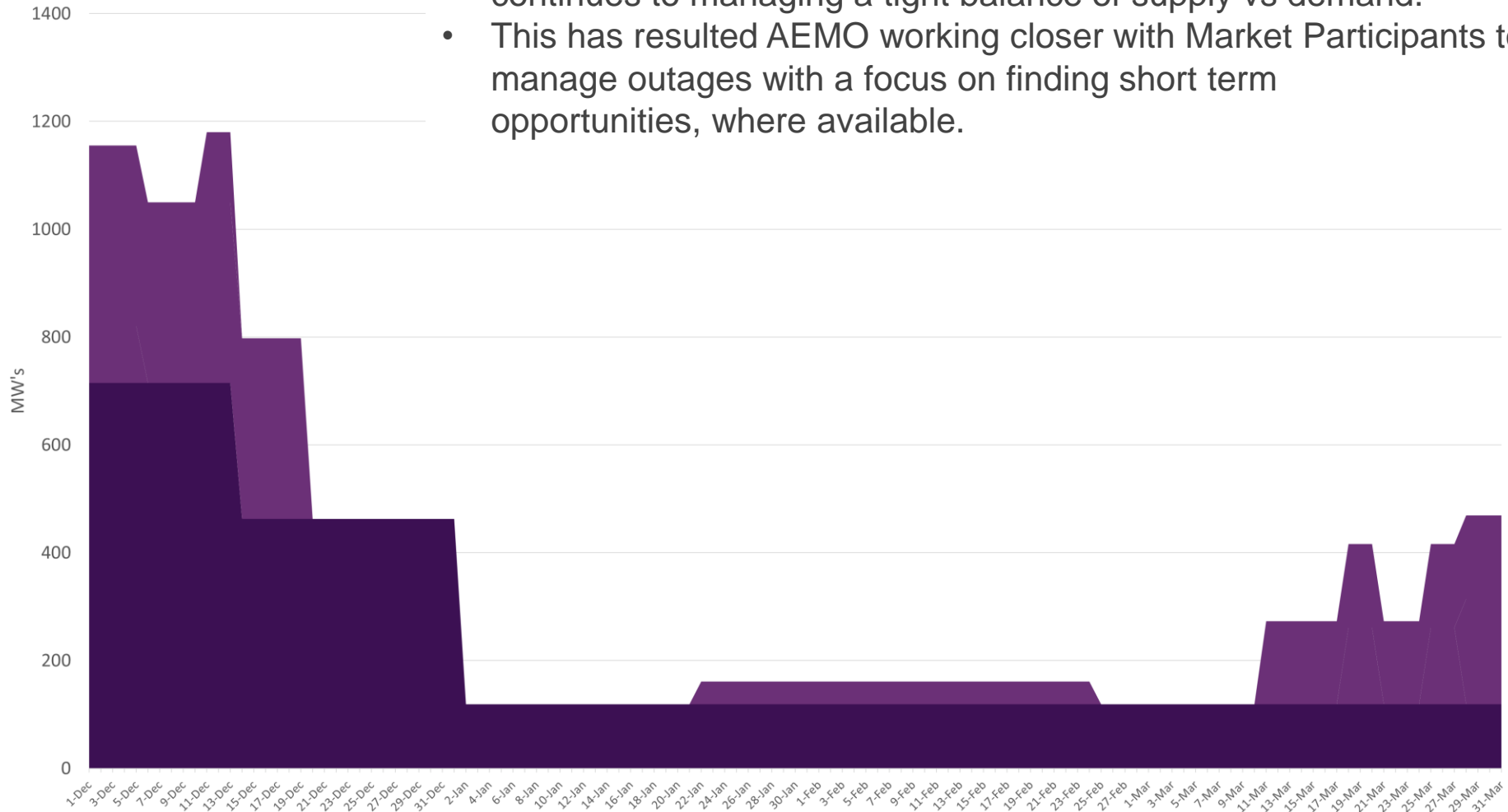
By Michael Dalton, Manager - WA Operational
Planning

7 December 2022



Managing outages

- Due to a high volume of generation on outage, AEMO has and continues to managing a tight balance of supply vs demand.
- This has resulted AEMO working closer with Market Participants to manage outages with a focus on finding short term opportunities, where available.

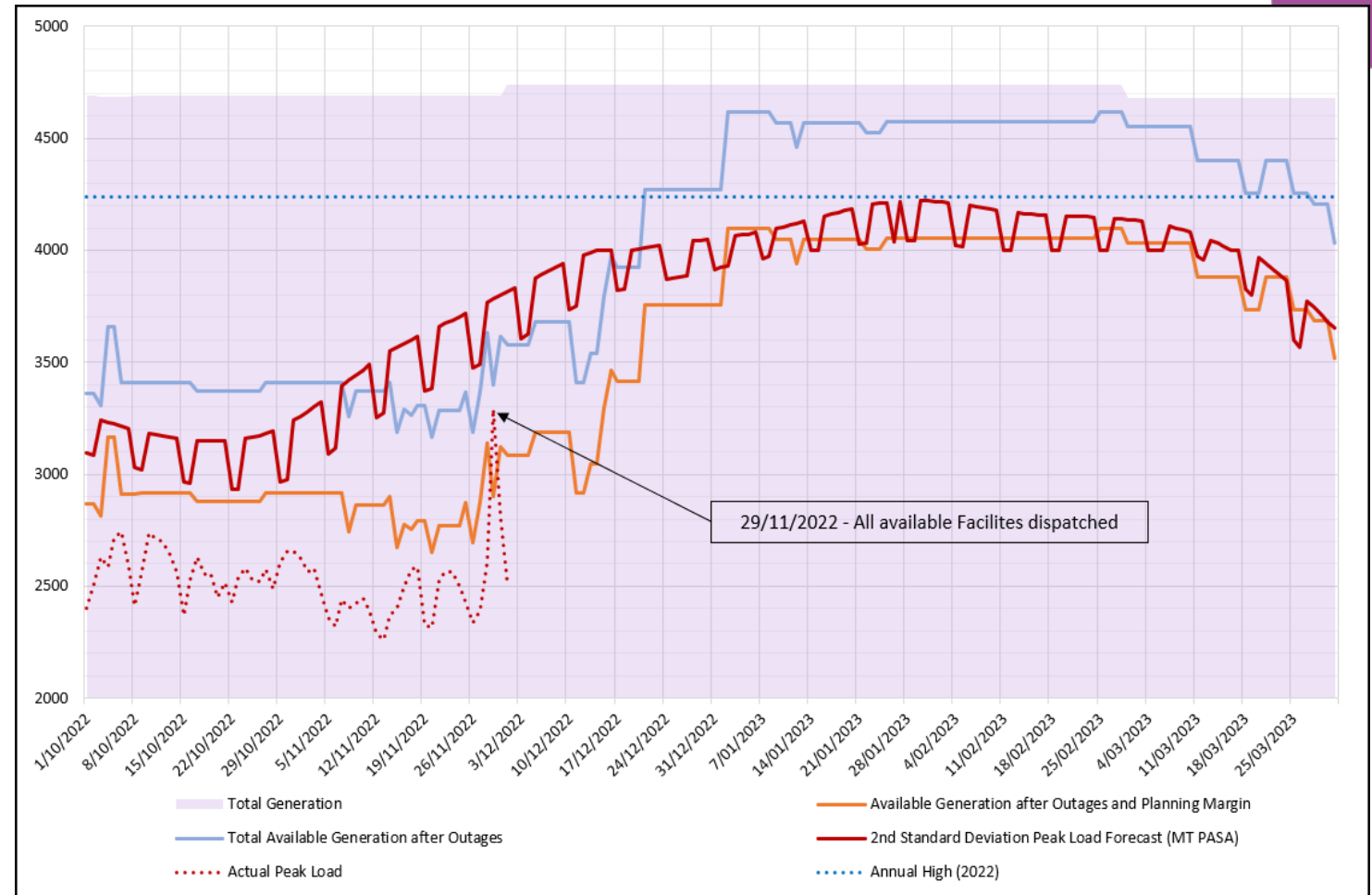


Forced

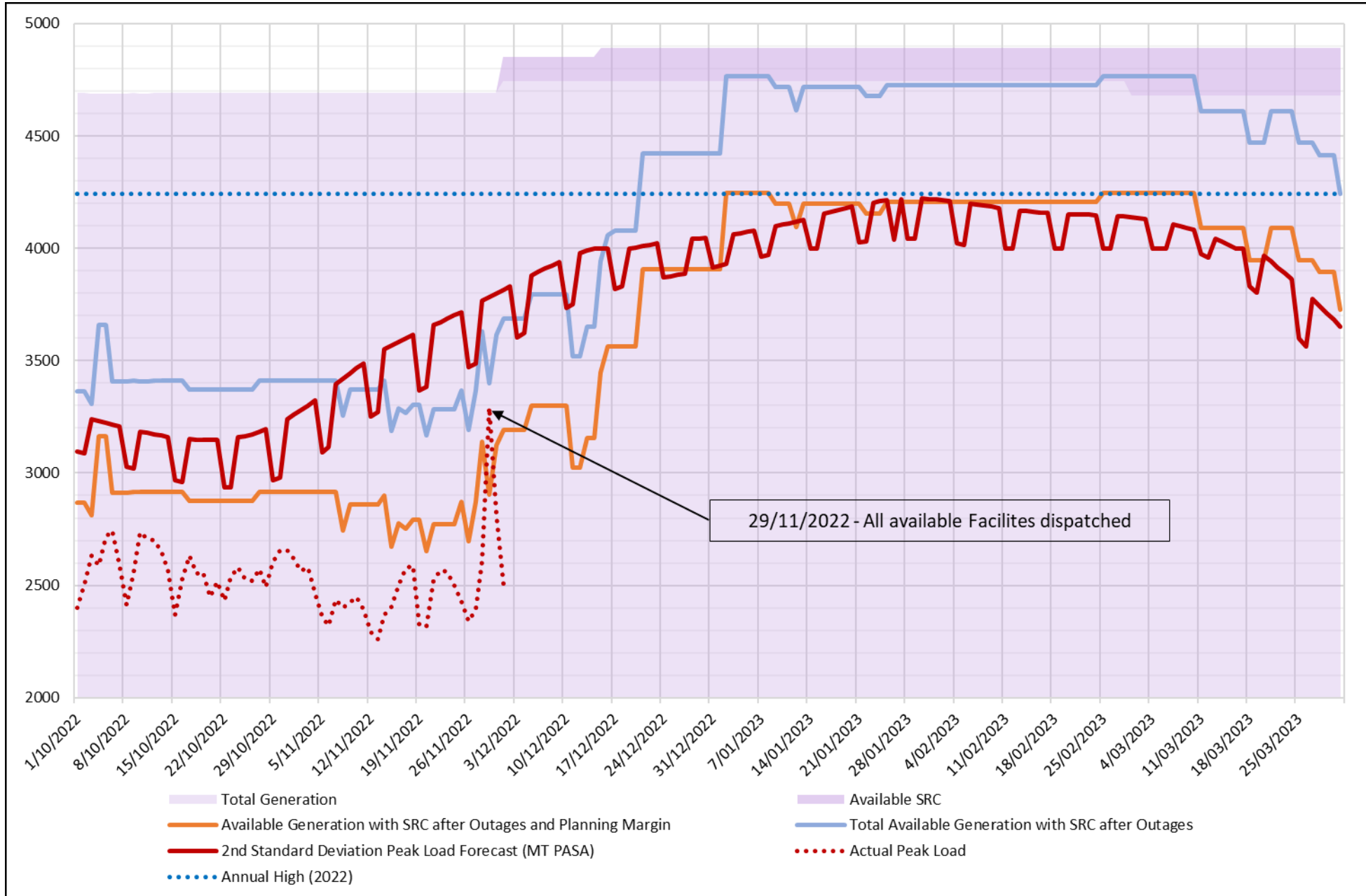
Planned

Balancing supply and demand

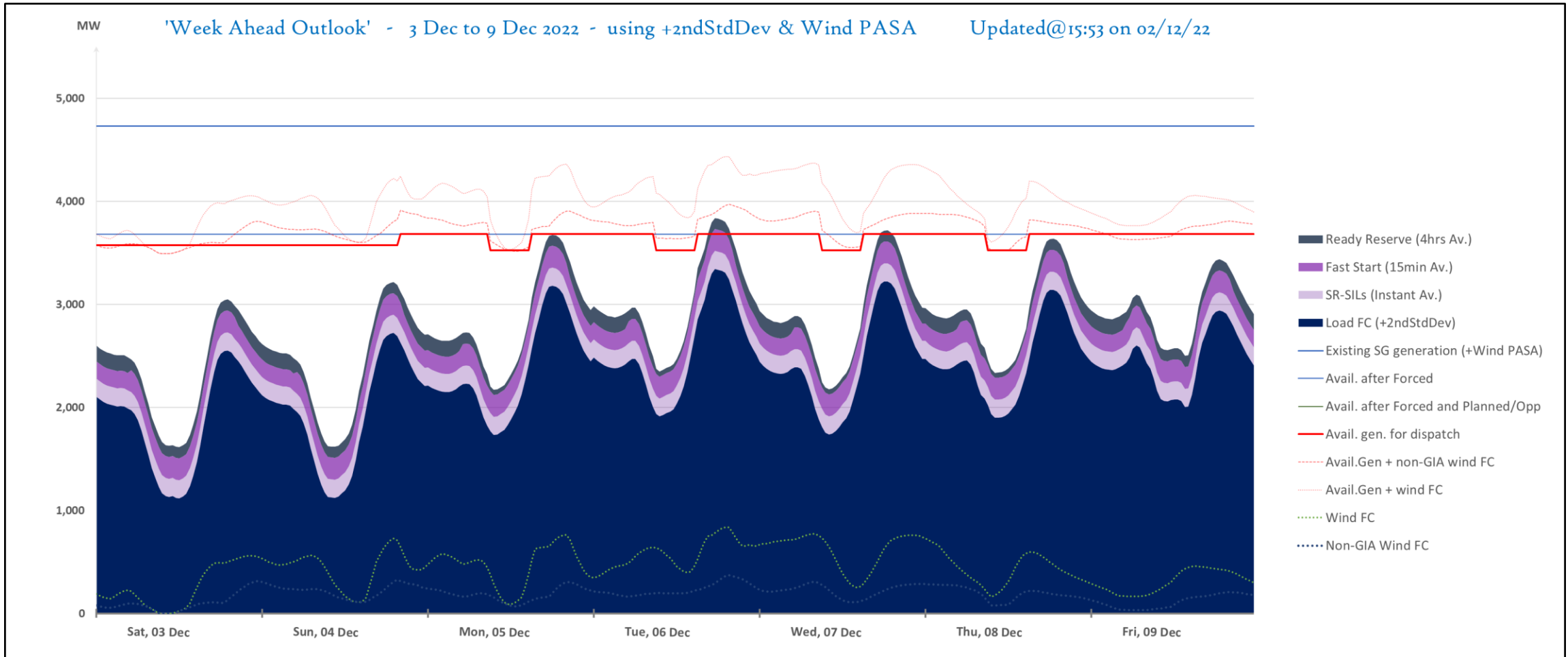
- Due to a number of forced outages, the outlook for spring and summer indicates periods of significant shortfalls in reserves, when considering a 2nd standard deviation forecast.
- Summer 2021/22 saw significantly higher temperatures and thus significantly higher demands. The Bureau indicates a similar summer in 2022/23.
- Coal preservation and ensuring adequate stockpiles for summer is a key focus.
- Closer to real time, demand forecasts are updated and more accurate estimates of wind are considered.
- Refining Control Room Procedures to manage the tight conditions.



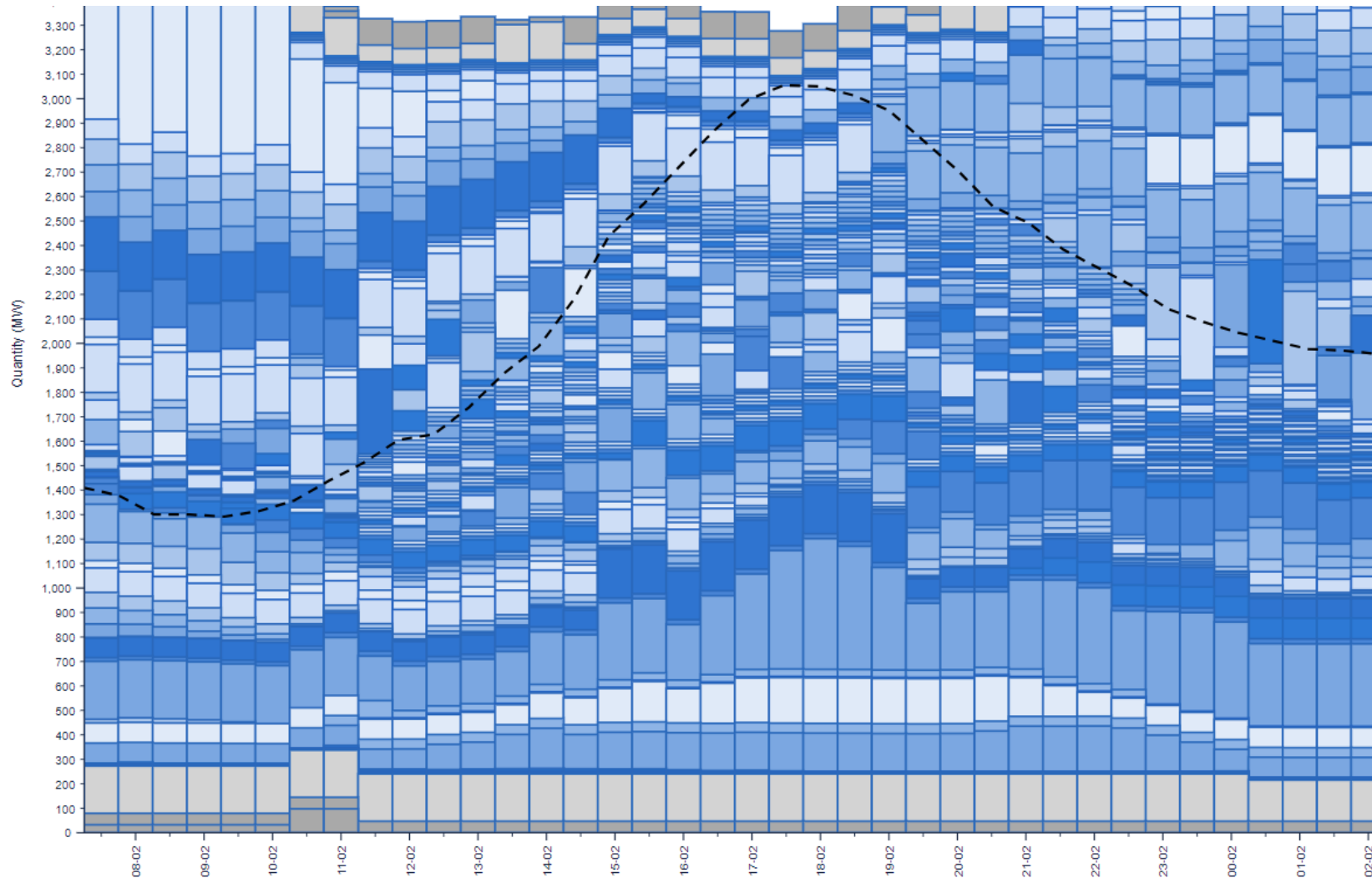
AEMO Summer Readiness | Outlook with SRC considered



7 day lookahead



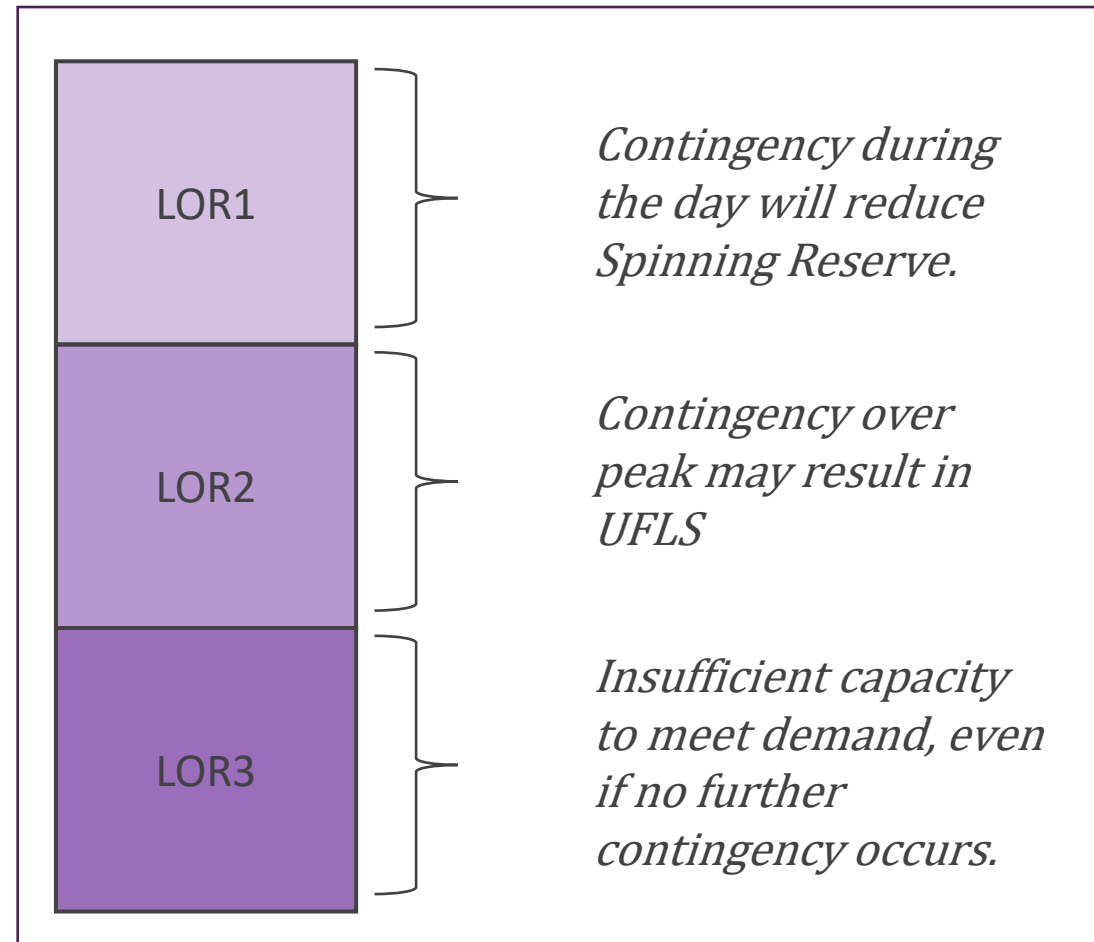
29/11/2022 – Operating Under Tight Conditions



- Daytime temperatures of 37 degrees and lingering overnight temps drove the load to 3,276MW at peak.
- Every available dispatchable generator was sent a Dispatch Instruction; including DSP's.
- AEMO controllers managed the peak but were left with a small buffer of reserves, adequate to operate the system securely.

Lack of Reserve (LOR) Notices

- A new Lack of Reserve notification framework has been developed to aid in identification of periods of tight demand vs supply.
- Each level of LOR have different operational actions associated to it.
- This helps streamline the processes that support AEMO operational teams and engagement with external stakeholders.
- Currently notifications are internal to AEMO only, but may be included in Dispatch Advisories in the future for information sharing purposes. Its not expected to drive any actions as all Facilities are required to be available all the time.



Actions AEMO can take

Dispatch all capacity in the market, including DSP and SRC*

Under Emergency Operating State, instruct all participants to support the system

Operate the system with reduced Ancillary Services
-> increased risk of UFLS

Instruct Western Power to manually load shed

*Timing of constraint and lead time to dispatch may influence the order in which these actions are taken

Stakeholder engagement

- AEMO is working closely with EPWA, Western Power, and Market Participants to prepare for managing the system during summer.
 - AEMO and Western Power review operational readiness on a regular basis, and are refining the processes for managing tight operational situations.
 - Discussions have included technical and communication considerations.
 - AEMO engaging with Market Participants to understand where any potential issues may be present which need attention
- There has been ongoing engagement with other Market and industry participants, both individually and through a SWIS Capacity Providers Forum.
- Internally, improving and enhancing internal procedures to manage the tight conditions we are experiencing at the moment.
 - Each practical experience is assisting in creating improved understanding and process improvements.



Questions and Feedback

wa.sm.operations@aemo.com.au

Reserve Capacity update

Neetika Kapani, Manager, Reserve Capacity (WA)

Manus Higgins, Senior Analyst, Reserve Capacity (WA)



Reserve Capacity update

- The RC testing process for the 2022-23 Capacity Year has commenced. Verification tests for DSP's now concluded. Non-Intermittent Generators are encouraged to self-test by 31 December.
- The CRC window for the 2022 RC Cycle is open until 14 February. Market Participants are encouraged to submit their CRC applications at least 10 BD prior to the window closure for AEMO to conduct a preliminary review. For reference, the CRC workshop slides are [here](#).
- The CRC WEM Procedure consultation period closes on 9 December. Proposed changes to the procedure are in relation to the additional fuel supply requirements required as part of the 2022 CRC application. More details can be found [here](#).
- AEMO has now published the 2023 Reserve Capacity timetable on its website [here](#).
- The 2023 Request for Expressions of Interest will be issued by 15 January 2023.

Supplementary Reserve Capacity

SRC process activated first time since 2006, where a potential shortfall of 174 MW was identified for the 2022-23 Capacity Year.



Existing challenges with coal supply, which may not be resolved in the near-term



Long-term outages and project delays



Stronger than forecast demand growth

Supplementary Reserve Capacity

- Following a tender process AEMO has received more than 200 MW of potential reserve capacity proposals for the period (1 December 2022 to 1 April 2023).
- AEMO is currently finalising the total reserve capacity and associated technical reviews, which includes a mixture of load curtailment and power generation solutions.
- In addition, AEMO is also undertaking several actions to prepare for peak demand periods, including:
 - coordinating market generators and demand side response capacity to operate as required;
 - recalling units from outages where possible;
 - working with Western Power to ensure other non-market sources of capacity are available to provide support if required.



Questions and Feedback

wa.capacity@aemo.com.au

WEM Reform Program Status Update



Presented to WA Electricity Consultative
Forum

By Andrew Smith, Program Director - WEM
Reform (WA) • Western Australia & Strategy

12 October 2022



WEM Reform Program Status Update | Nov 2022

Overall Status

Following a full program review, AEMO has increased confidence in achieving the 1 October 2023 go live date. Whilst scope and schedule have been resolved, additional funding is expected to be required and the Program status will remain as **red** until budget is resolved.

Key Activities This Period

- **Market Readiness:** Market Readiness Report 5 was released. Coverage of facilities has improved from previous survey. The readiness of most facilities (by capacity) is reported as “On Track” and improving. Feedback and concerns raised by respondents informed November WRIG content.
- **Rules:** AEMO completed its supporting role drafting Tranche 6 of the WEM Rules.
- **Procedures:** presented on Adjustment of ESS Parameters for Dispatch WEMP and Power System Security WEMP (11/11), Dispatch Settlement and Data Monitoring WEMP, and Network Access Quantities (NAQ) WEMP 3 of 4 (24/11).
- **Participant work guidance:** Following the Program Review and queries and feedback from participants, AEMO provided WRIG with an updated overview of system solutions and implications for participant work programs.
- **Market Trial overview:** Briefed WRIG on the Market Trial approach and high level schedule and the opportunities for participant input – through artefacts currently under development.
- **System Development:** Highlights include:
 - **WEMDE UI:** Provide high-level overview of the interface / publishing solution to the Market (24/11)
 - **API Management:** Provide participants with an overview of AEMO’s approach to transitioning to API Management (24/11)
 - **RCM:** completed Phase 2 Release 2.2 into production (16 Nov 2022, RCM Portal – non-participant facing)

Focus For Next Period

- **Market Readiness:** Release Survey No.6 (30 Nov) and report back January ‘23.
- **Rules:** watching brief.
- **Procedures:** Consult on Real-Time Market Submissions, Notices and Communications and ESS Quantity Determination Methodology.
- **Industry Testing and Transition Strategy:** Publish consultation version of over-arching strategy to cover all remaining stages of industry testing and transition. The first iteration of this living document will focus on the elaboration of the market trial phase.
- **System Development:** Progress development work including:
 - **RTMS:** publish release 3 documentation (targeting mid-Dec) and prepare for release to MPT (Jan 2023)
 - **WEMDE UI:** publish technical specifications for API to consume dispatch outcomes files.
 - **Outage Management:** continue development of multiple APIs for rule participants and continue consultation and planning for final release to MPT in Feb 2023

Stakeholder Engagement

WRIG
24 Nov

Market Readiness Survey
Release
30 Nov

WAECF
7 Dec

WRIG
8 Dec

Market Readiness Survey
Report
Jan ‘23

WEM Reform Program

Year in Review



WEM Reform Implementation Group (WRIG)

- External industry forums were consolidated into the WRIG Forum that is now hosted by AEMO.

Market Trial Approach

- An approach for Market Trial and transition activities was developed including the creation of a draft Industry Testing and Transition Strategy.

Market Readiness Survey

- Conducted six Market Readiness Surveys and results published (Market Readiness Reports).

System Releases

- The following were deployed into the Market Participant Test environment:
 - RTMS
 - RCM Phase 2.1 and 2.2
 - Outage Management 1.0

Established Market Capabilities

- A list of specific readiness criteria that describes what a given entity needs to know and/or be ready to do to successfully operate, support or participate in the new WEM and thereby meet their obligations under the revised WEM Rules.

WEM Procedures

- Published eight WEM Procedures (16 in total to date).



Questions and Feedback

wa.ets@aemo.com.au

WA DER Program Update

Presented to WA Electricity Consultative
Forum

Tom Butler, Manager WA Distributed
Markets

7 December 2022



WA Distributed Markets

December 2022



Our vision: Enabling distributed energy resources and new technologies to be an integral part of the SWIS through the WEM by supporting security and reliability, as we move towards a 100% instantaneous renewable energy power system.

- **Project Symphony**

- Major milestone reached in November with testing now underway for two scenarios. Whilst early results are promising ongoing identification and resolution of issues is a focus, whilst deployments continue for the final scenarios.

- **DER Participation**

- Completion of the VPP Visibility Guideline has been a focus, drawing on submission to the consultation on the proposed framework. To close off Stage 1 of the Framework AEMO is seeking to publish the Guideline by the end of the year.

- **DER Register**

- Planning for DER Register enhancements is completing in December, with a view to publish the updated WEM DER Register Information Procedure for consultation during December and January (proposed AEMO Procedure Change Working Group meeting on 17 January).
- Key changes to the procedure (and therefore register) include adapting the data models to collect information on Electric Vehicle charging equipment and other DER equipment, accommodating revisions to standards, operational information and generally clarifying the procedure.
- The targeted updated procedure commencement date is 2 October 2023.



WA DER Market Participation Forum:

- 13 December 2022

Register your interest:

WADERProgram@aemo.com.au

View previous presentations on our forum webpage:

[WA DER Market Participation Forum](#)



Questions and Feedback

WADERProgram@aemo.com.au

AEMO Year in Review 2022

Presented to WA Electricity Consultative Forum

7 December 2022





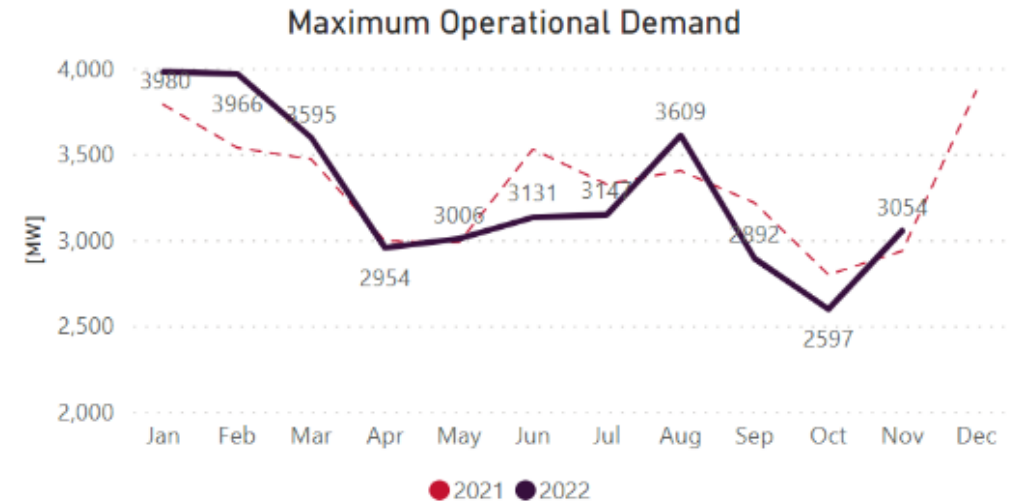
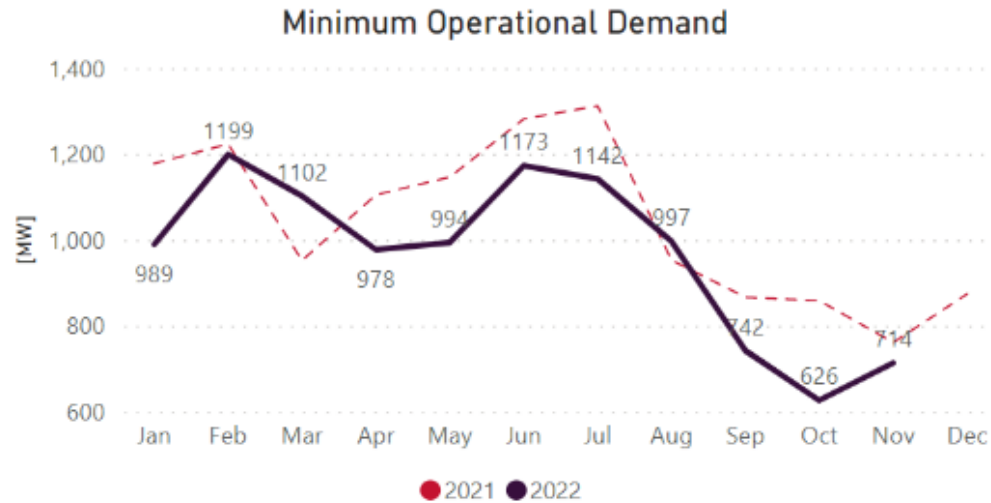
Operations, Analytics & Insights

Erika Canuti - WA Analytics & Insights

Danielle Bestall - WA Market Operations & Support



Operational demand



- 1 Minimum operational demand was generally lower compared to 2021, particularly in the shoulder season, with an all-time record of 626 MW on 16 October 2022.
- 2 Maximum operational demand in summer months was higher compared to 2021, with a maximum value of 3,980 MW on 19 January 2022.
- 3 In 2022, a record of winter operational demand was set with a value of 3,609 MW on 9 August 2022

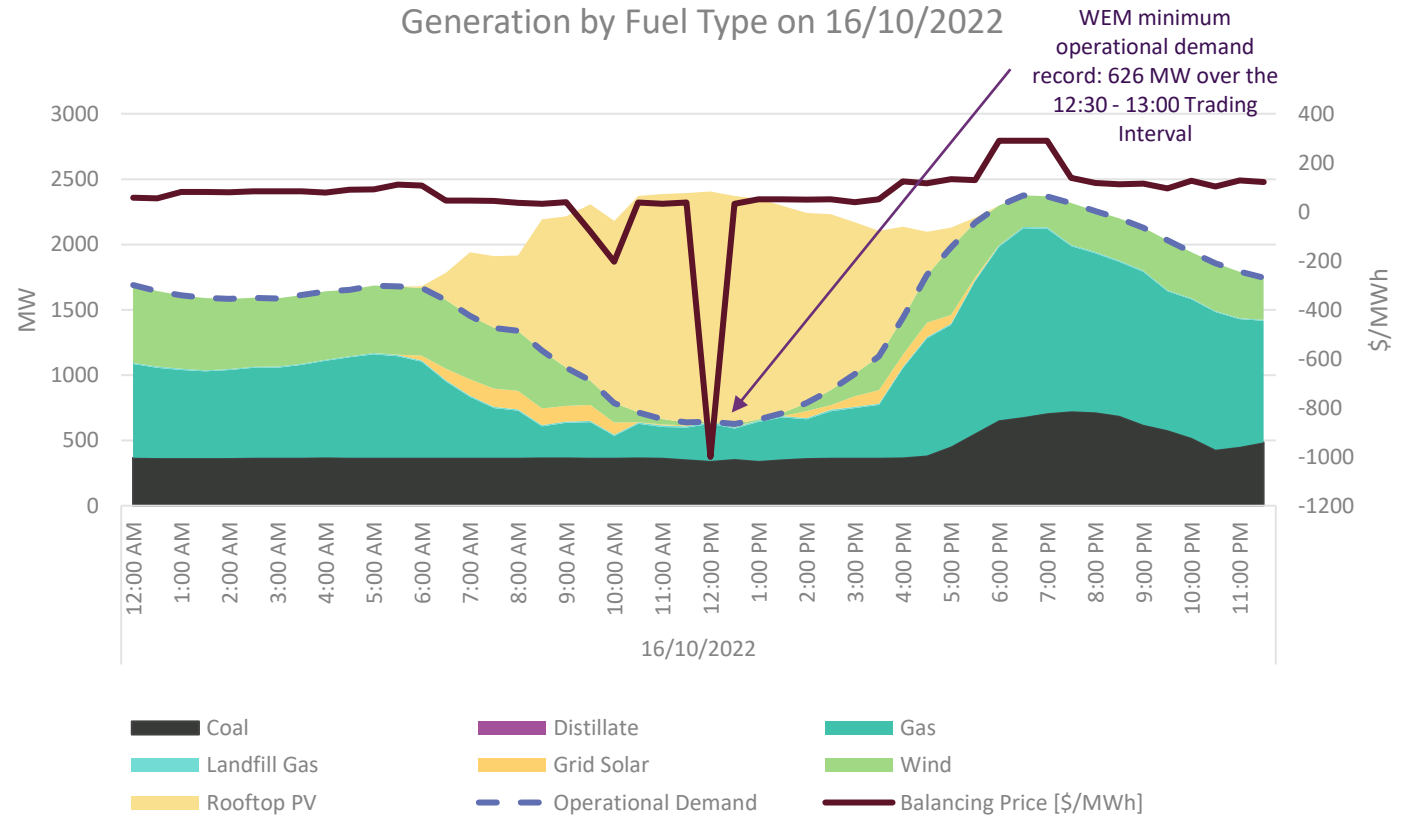
*Data up until 30 November 2022

All-time record of maximum operational demand is 4006 MW on 8 February 2016

Operational Demand is the average measured total of all wholesale generation from registered Facilities in the SWIS and is based on non-loss adjusted sent out SCADA data.

Record minimum operational demand 16 October 2022

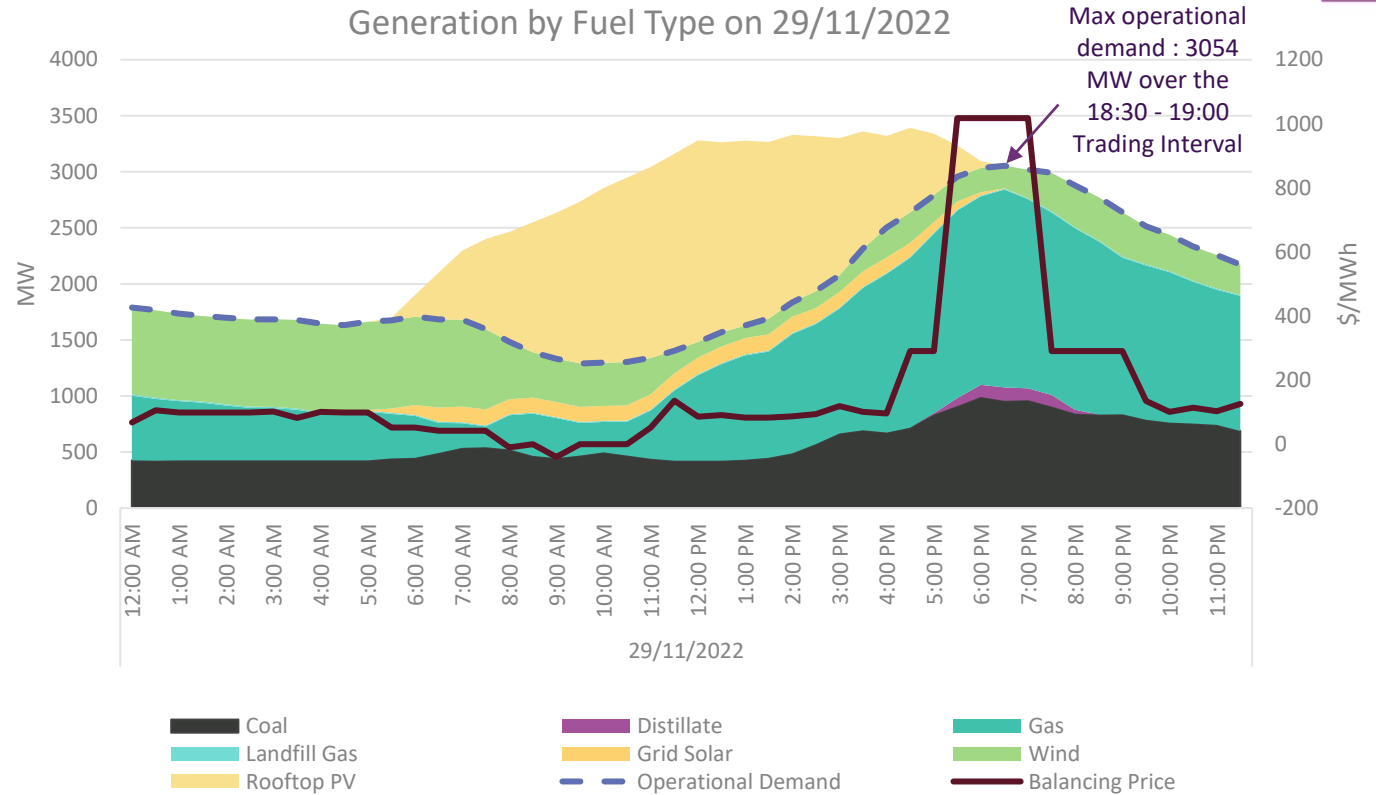
- On Sunday, 16 October 2022 the WEM recorded an all time record minimum operational demand of 626 MW over the 12:30 - 13:00 Trading Interval.
- During the record minimum demand Trading Interval renewable penetration was 75.08%* on underlying demand (including estimated DPV).
- The major contribution on renewable penetration was from DPV which covered 73.60% of underlying demand. This is an all-time record.
- The Balancing Price cleared at -\$1000/MWh on the interval before the record minimum demand.



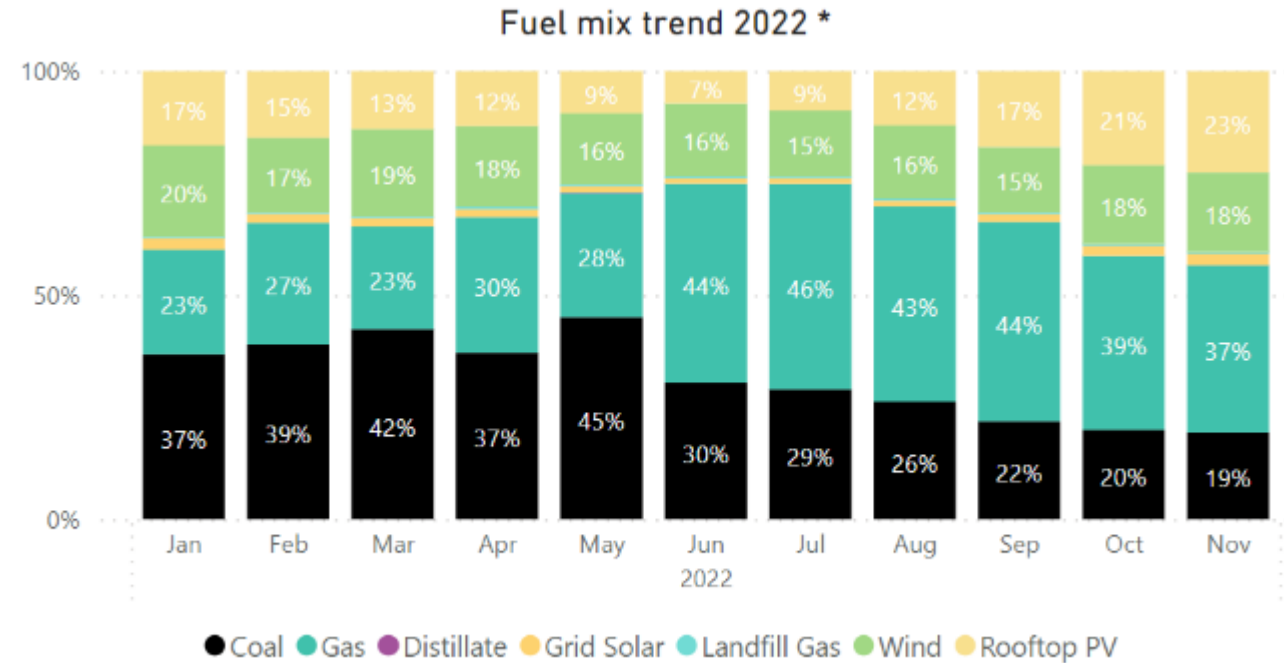
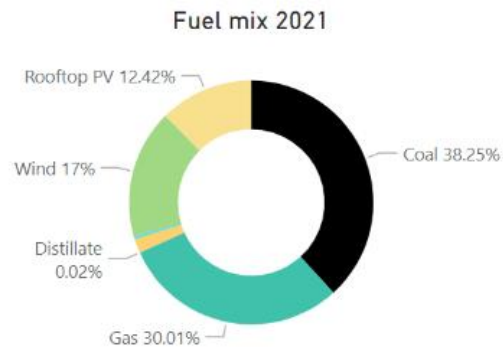
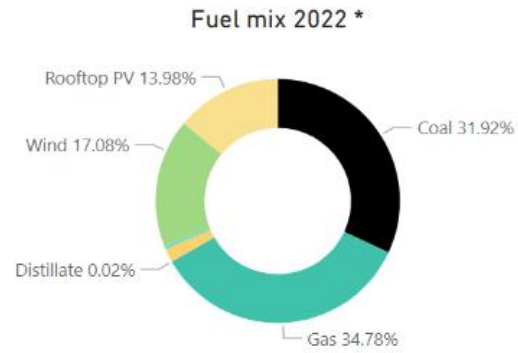
* Values of % renewable penetration are an average across the Trading Interval. They include generation from wind, grid solar, biomass and landfill gas facilities and estimated DPV generation. Embedded generation is not included.

Tight operational demand 29 November 2022

- On Tuesday, 29 November 2022 operational demand during the evening peak reached a maximum of 3,054 MW.
- To cover demand during the evening peak all facilities in the BMO came in merit and received Dispatch Instructions to generate, including diesel facilities.
- This was due to a combination of high temperatures and large number of generators on outage.
- As a consequence, the Balancing Price cleared at the Alternative Maximum STEM Price (\$1,018/MWh) from 17:30 to 19:30.

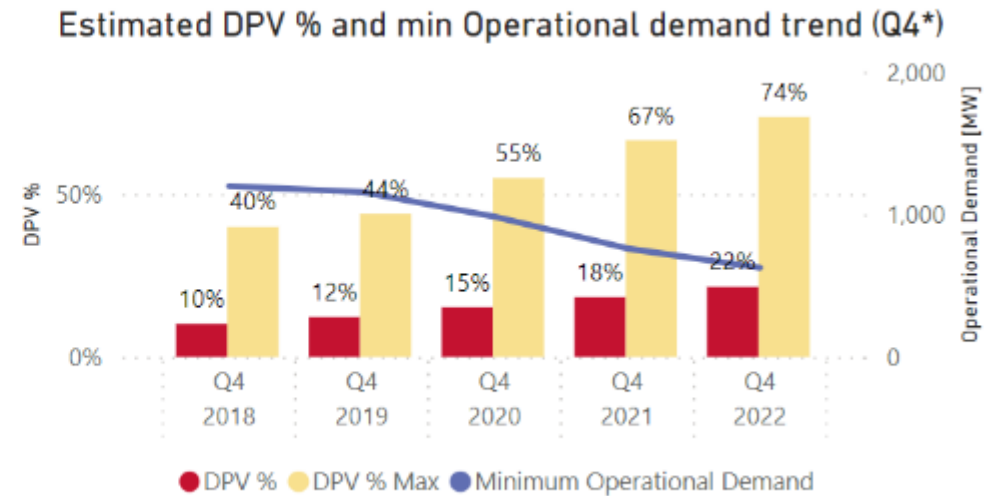
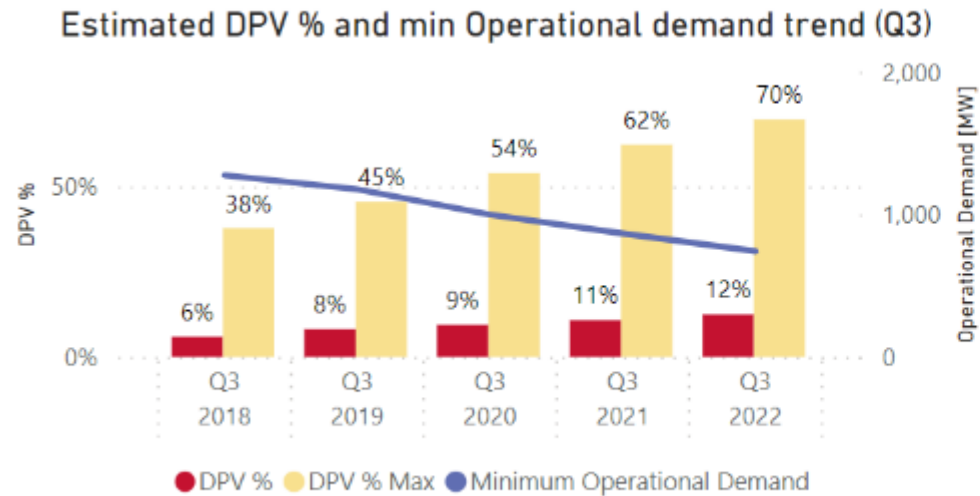


Fuel mix



- 1 Decrease in coal-fired generation (-16.5%) compared to 2021 and increase in gas-fired generation (+15.8%). This is due to low coal facility availability, especially in the second half of 2022.
- 2 In October and November 2022, the estimated contribution of rooftop PV to total generation was >20%

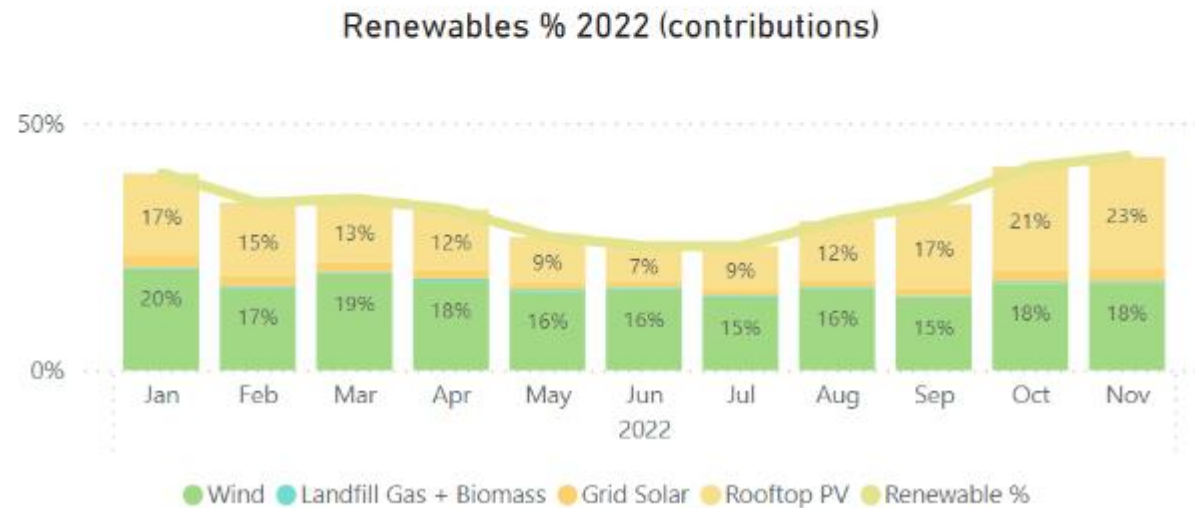
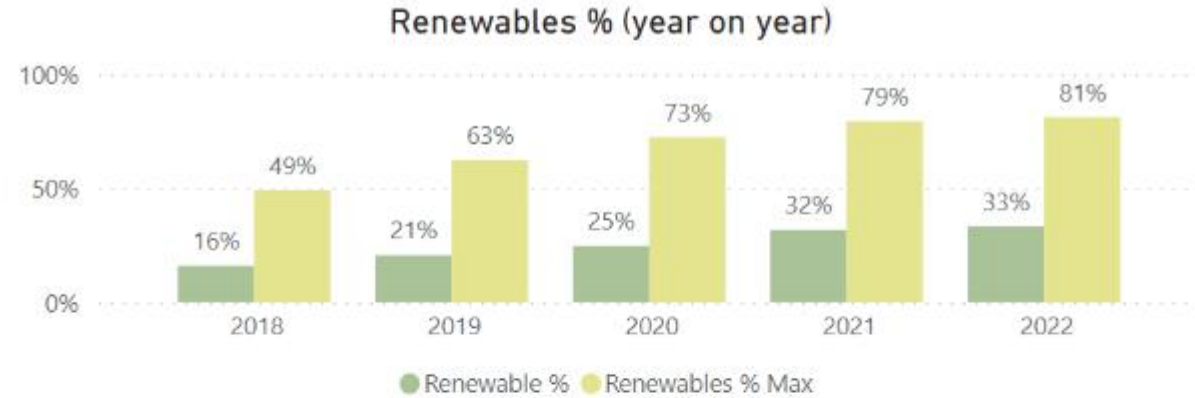
Estimated rooftop PV generation



- 1 The year on year increase in estimated distributed PV generation (especially in Q3s and Q4s) is correlated to the decrease in minimum operational demand.
- 2 The all-time record of estimated distributed PV contribution on underlying demand was set on 16 October 2022, the day when the record minimum operational demand was also set.

Renewable penetration

- 1 Increase in renewable penetration compared to previous years, with a 33% renewable contribution to total generation (including rooftop PV) in 2022*.
- 2 Three all-time records of renewable penetration were set in November 2022 (on consecutive weekends), with the latest record of 81.3% over the 14:00 – 14:30 Trading Interval on Saturday 26 November 2022.
- 3 November 2022 was the month with an all-time record of renewable penetration of 43.3%*.
- 4 Rooftop PV contributed for 14% to total generation in 2022, with higher values in summer and spring.
- 5 Wind contribution to total generation in 2022 was 17%*, with a stable monthly trend.

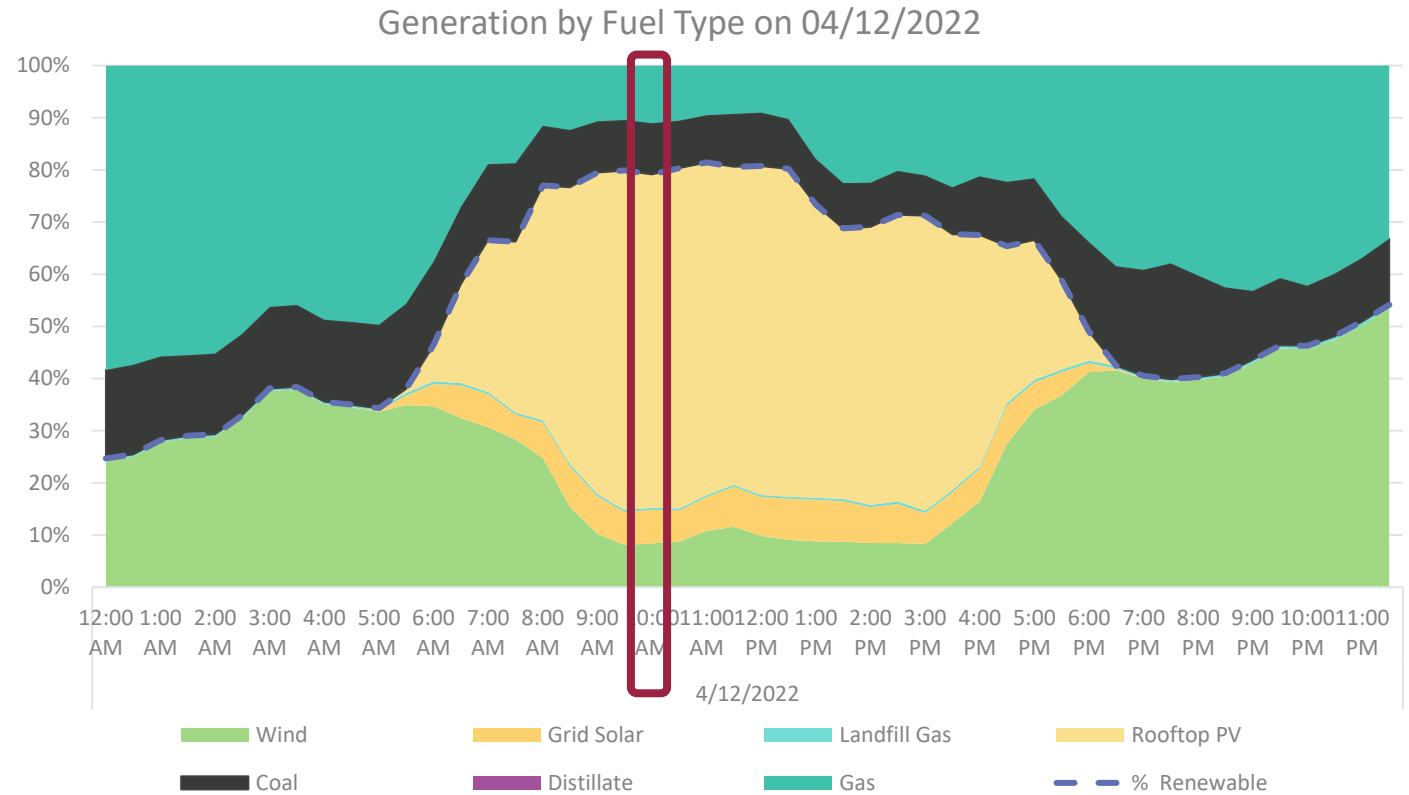


*Data up until 30 November 2022

Values of % renewable penetration are an average across the Trading Interval. They include generation from wind, grid solar, biomass and landfill gas facilities and estimated DPV generation. Embedded generation is not included.

Latest record renewable penetration – 4 December 2022

- Record renewable penetration of 81.4% across the 10:00 – 10:30 Trading Interval on Sunday 4 December.
 - +0.13% from previous record
- Contribution to underlying demand:
 - DPV: 63.8%
 - Wind: 10.8%
 - Grid Solar: 6.5%
- At that time, operational demand was 786.5 MW.



* Values of % renewable penetration are an average across the Trading Interval. They include generation from wind, grid solar, biomass and landfill gas facilities and estimated DPV generation. Embedded generation is not included.

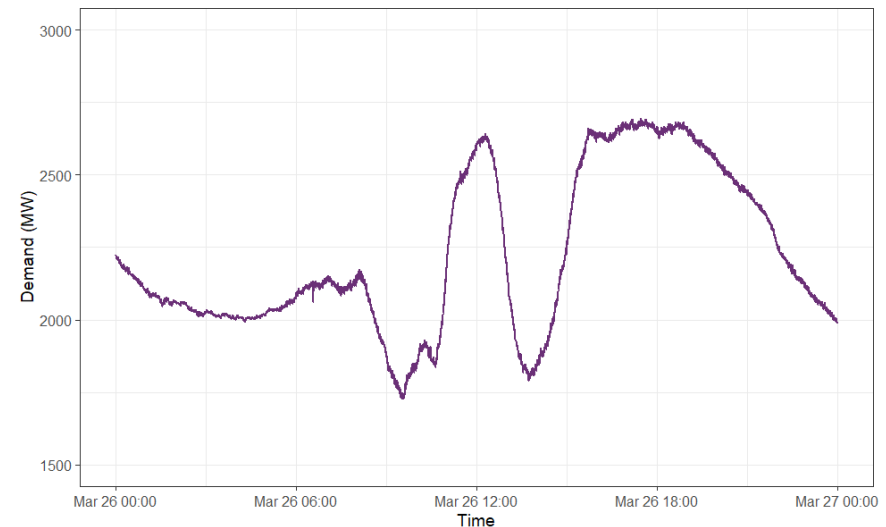
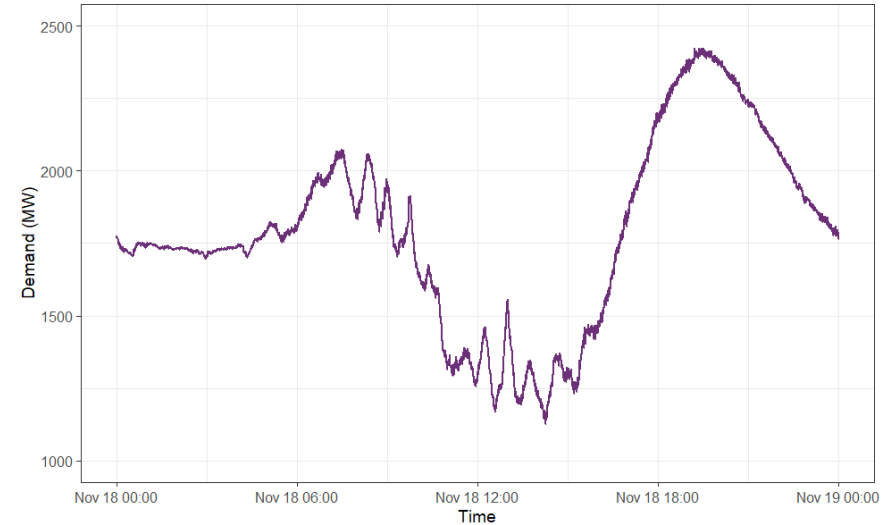
Records

	2022 record*		All-time record	
Maximum operational demand	3979.8 MW	19/01/22 18:00 – 18:30	4005.9 MW	08/02/16 17:30 – 18:00
Minimum operational demand	626.3 MW	16/10/22 12:30 – 13:00	Same as 2022 record	
Maximum renewable generation (%)	81.4%	04/12/22 10:00 – 10:30	Same as 2022 record	
Maximum renewable generation (MW)	2357.6 MW	04/11/22 12:00 – 12:30	Same as 2022 record	
Maximum rooftop PV generation (%)	73.6%	16/10/22 12:30 – 13:00	Same as 2022 record	
Maximum rooftop PV generation (MW)	1865.5 MW	01/11/22 11:30 – 12:00	Same as 2022 record	
Maximum wind generation (%)	55.56%	05/12/22 00:30 – 01:00	Same as 2022 record	
Maximum wind generation (MW)	932.9 MW	07/06/22 20:00 – 20:30	944.5 MW	27/06/21 13:00 – 13:30
Maximum grid solar generation (%)	8%	13/11/22 10:00 – 11:00	Same as 2022 record	
Maximum grid solar generation (MW)	150.6 MW	09/01/22 10:30 – 11:00	Same as 2022 record	
Maximum Balancing price	\$1018/MWh	29/11/22 19:00 – 19:30	Same as 2022 record	
Minimum Balancing price	-\$1000/MWh	16/10/22 12:00 – 12:30	Same as 2022 record	
Maximum STEM price	\$253/MWh	20/10/22 8:00 – 8:30	\$498/MWh	02/07/08 7:30 – 8:00
Minimum STEM price	-\$33.24/MWh	06/09/22 14:30 – 15:00	-\$153.73/MWh	21/09/06 7:30 – 8:00

*Data up until 7 December 2022

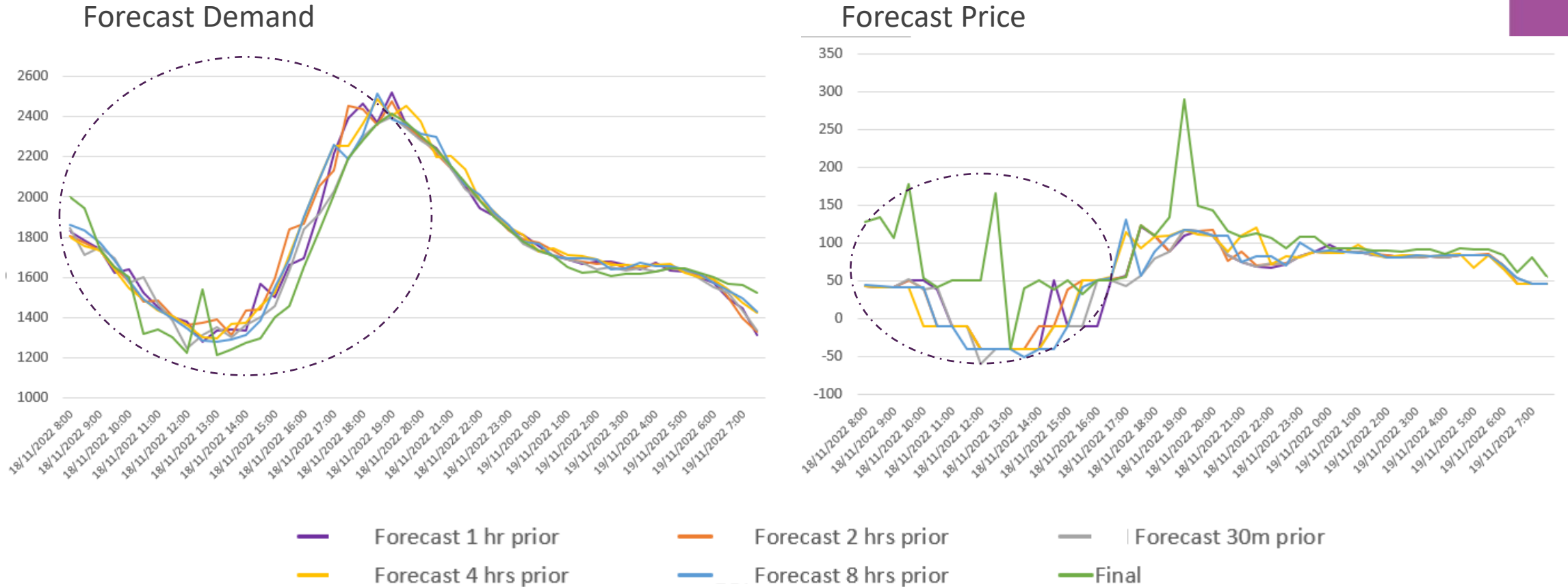
Load Variability

- Higher penetration of distributed PV has led to an increase in load variability throughout 2022.
- There have been instances of large ramps up and down (up to 30%) due to a large clouds bursts over the Perth metropolitan area.
- There have also been several consecutive small ramps up and down due to small cloud bursts over pockets of Perth's metropolitan area as well as small cloud burst over regional areas with high levels of distributed PV.



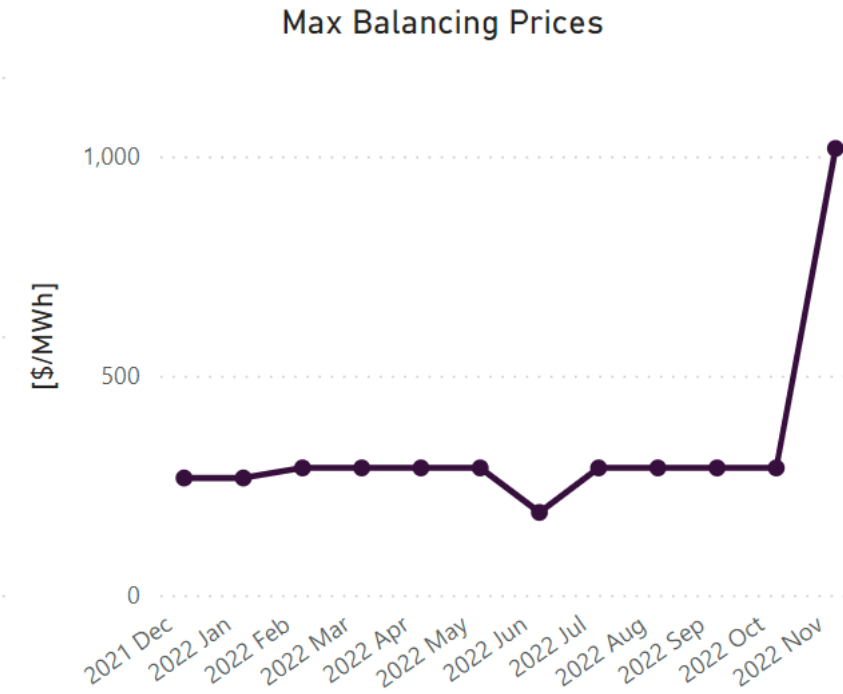
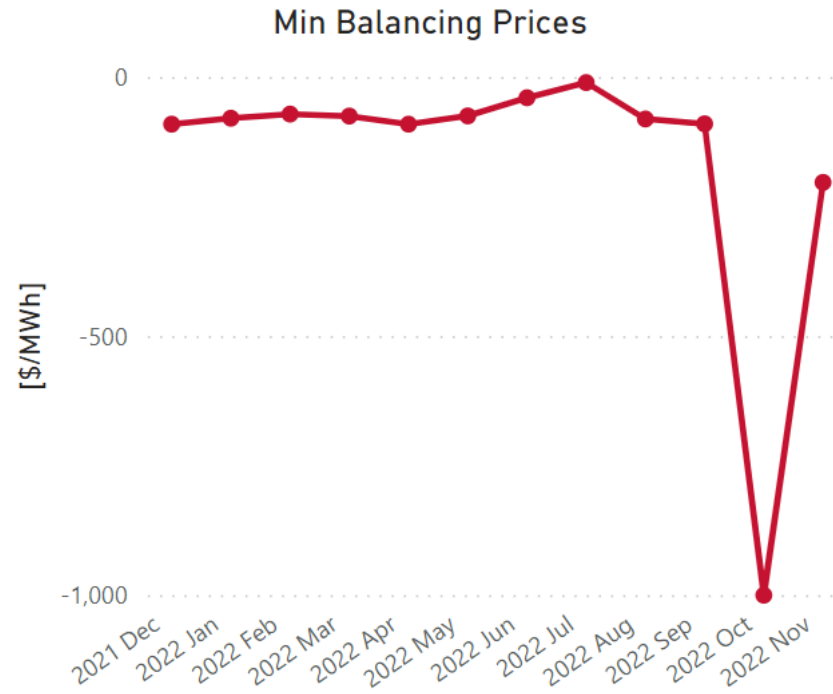
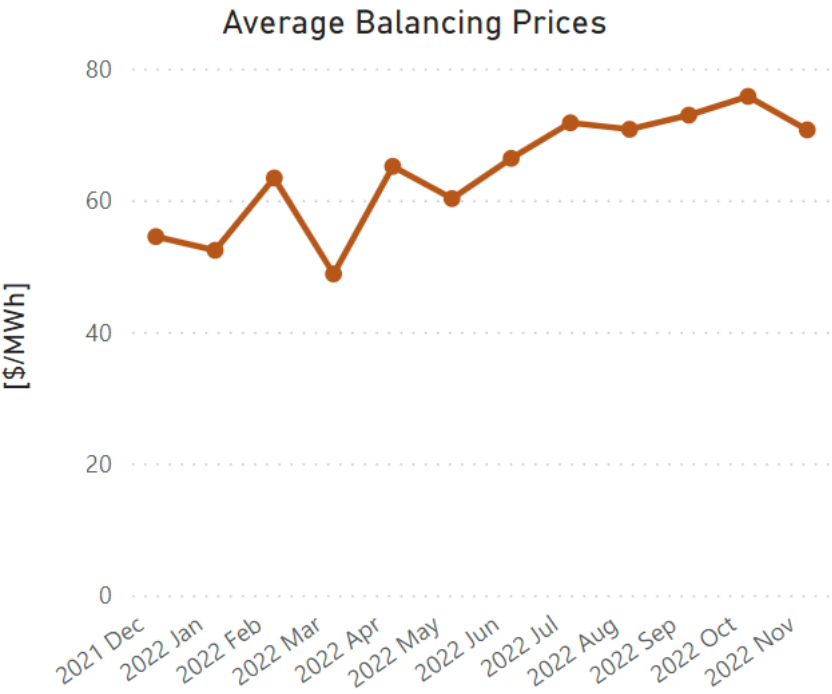
Forecast Price Variability

Friday 18 November 2022



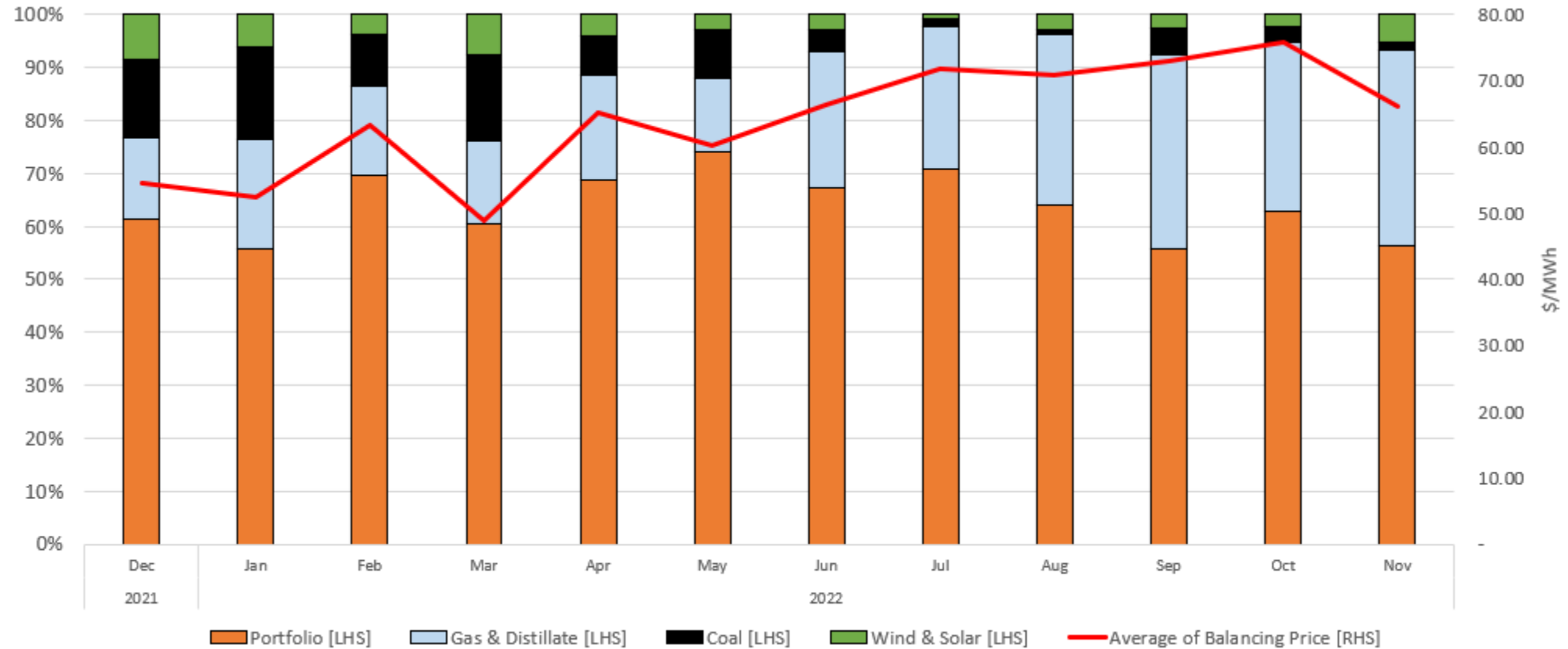
- 1 Large demand fluctuations from forecast, due to changes in DPV generation, result in forecast Balancing Price variability.
- 2 Demand fluctuations are one of the main drivers of the large variations between forecast and final Balancing Prices during the middle of the day.

Balancing Prices



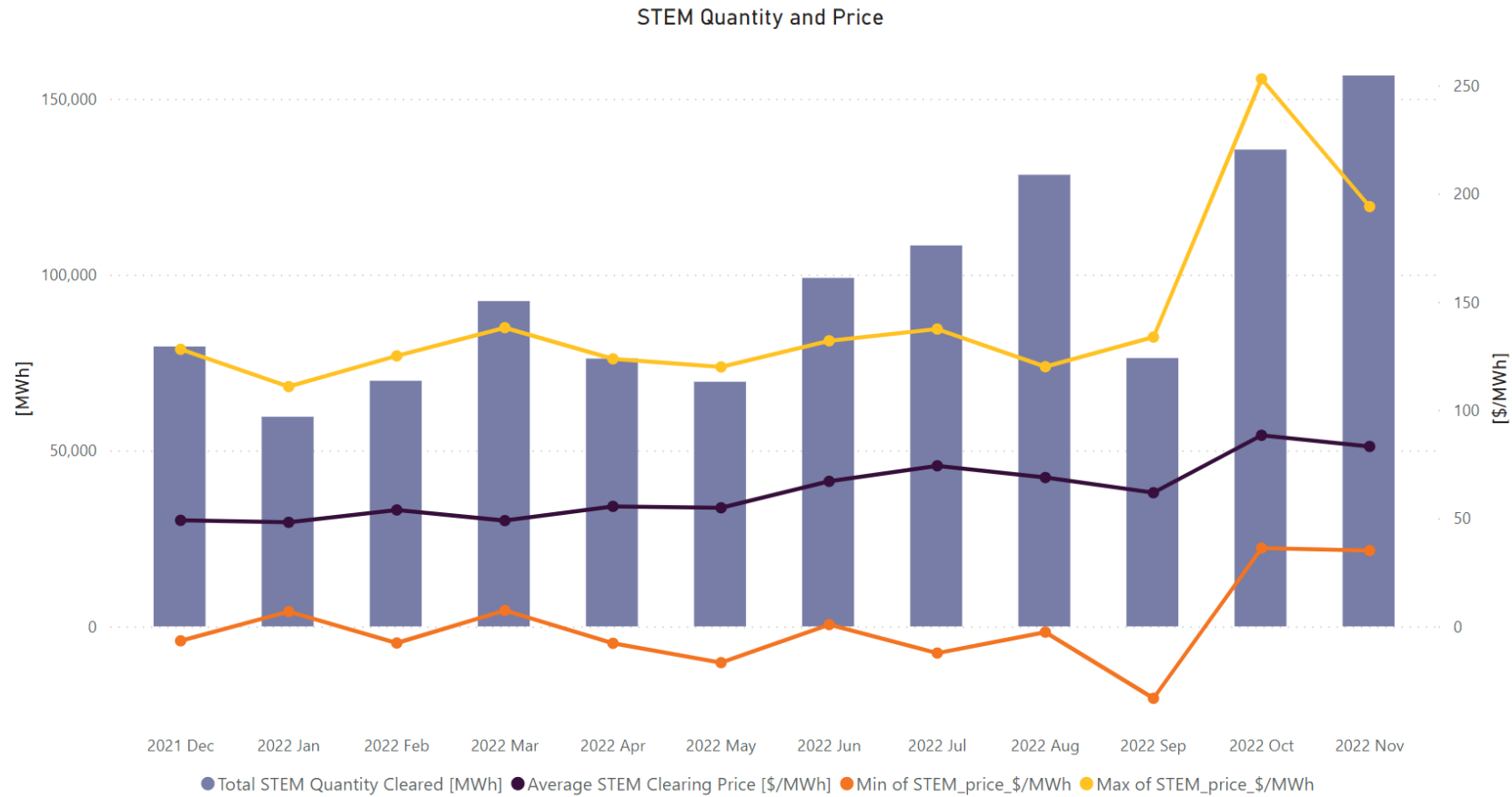
- 1 Average Balancing Price increased throughout the year mainly due to decreased Facility availability.
- 2 Minimum Balancing Price was consistent throughout the year. The exception is October 2022 where the minimum Balancing Price was $-\$1,000/\text{MWh}$, this was due to the minimum demand event.
- 3 Maximum Balancing Price was consistent throughout the year, however November 2022 saw a record maximum Balancing Price of $\$1,018/\text{MWh}$.

Price Setting Fuel



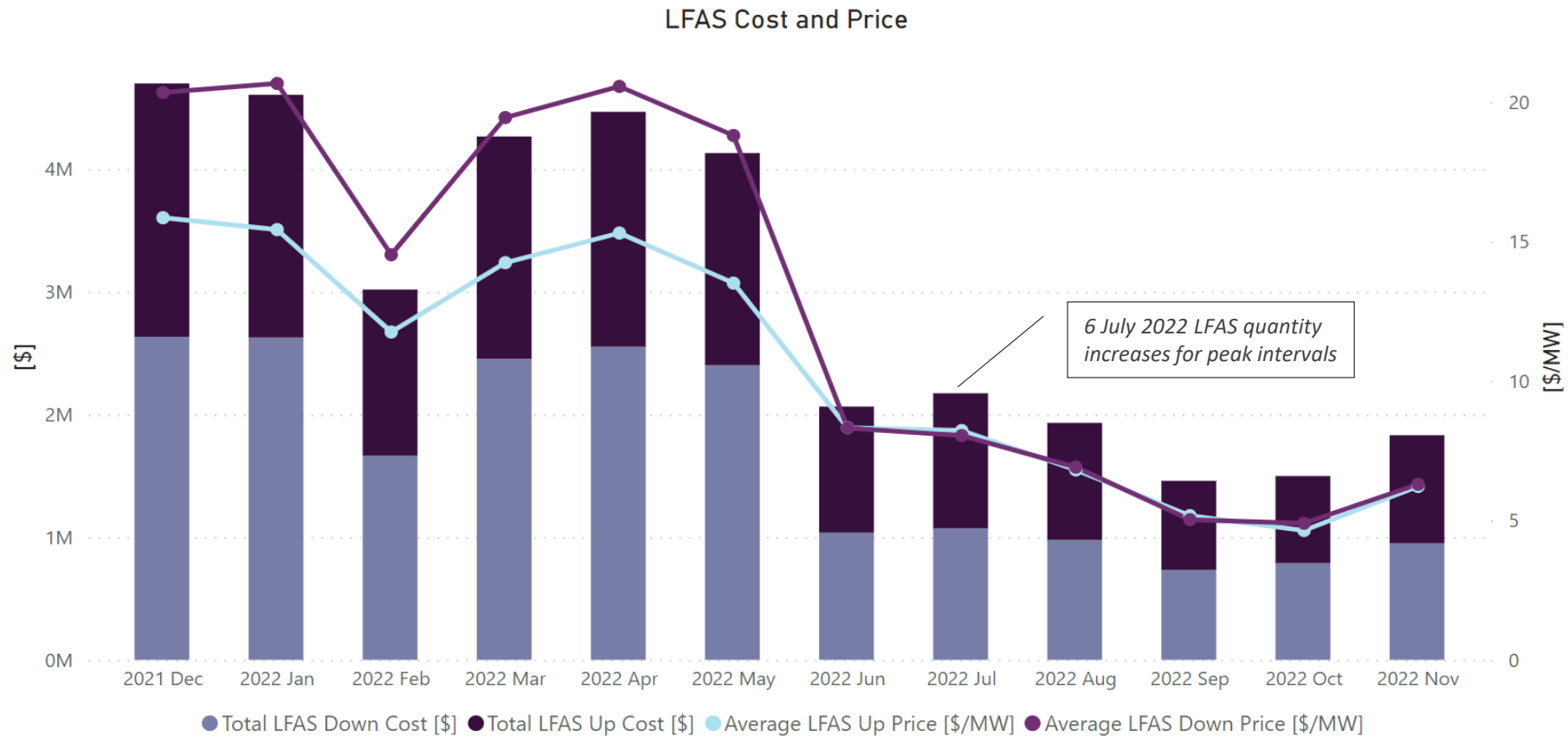
- 1 The Balancing Portfolio set the Balancing Price 64% of the time.
- 2 Coal Facilities set the price less frequently throughout the year, with gas-fired generation setting the price more frequently.

STEM Prices



- 1 Increase in total STEM quantity cleared throughout the year, this is in part driven by higher Balancing Prices.
- 2 Average STEM clearing price increased due to increased STEM participation.

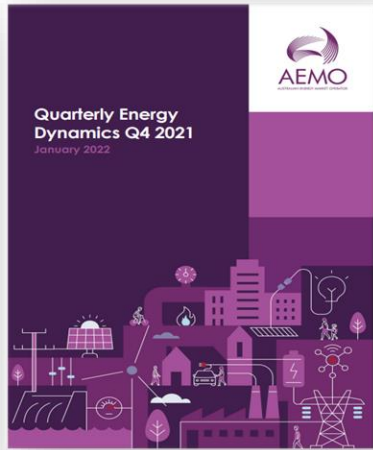
LFAS Price and Cost



- 1 Effective Trading Day 6 July 2022 the approved LFAS quantity increased in the peak intervals while off-peak remained unchanged:
 - 100MW to 110MW (peak)
 - 65MW (off-peak)
- 2 Despite increased LFAS procurement, the power system experienced unprecedented demand variability. Sometimes variability exceeds the approved LFAS quantity, which is managed in real-time.

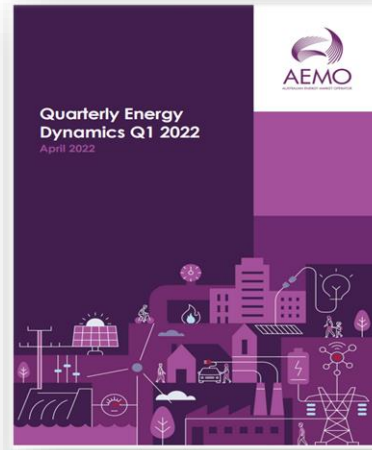
Quarterly Energy Dynamics Analysis

Q4 2021



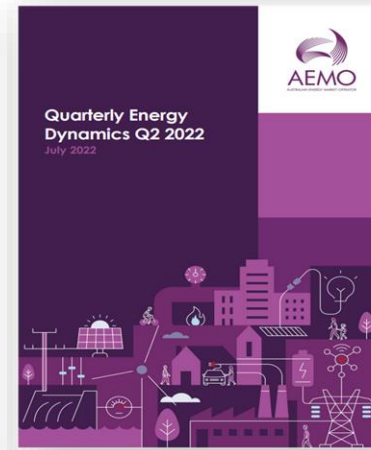
- “A late heatwave drives high demand and price events in the WEM”
- “Increasing renewable contribution leads to record low WEM minimum demand”

Q1 2022



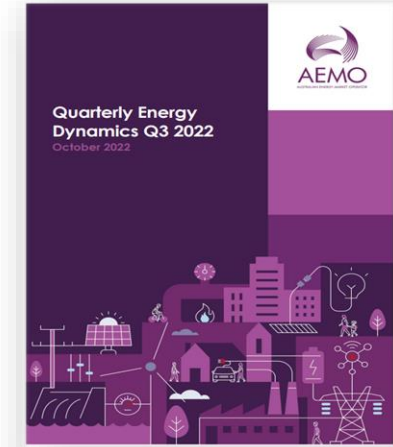
- “High temperatures drive demand and prices”
- “All fuel types increased output to meet the evening peak”

Q2 2022



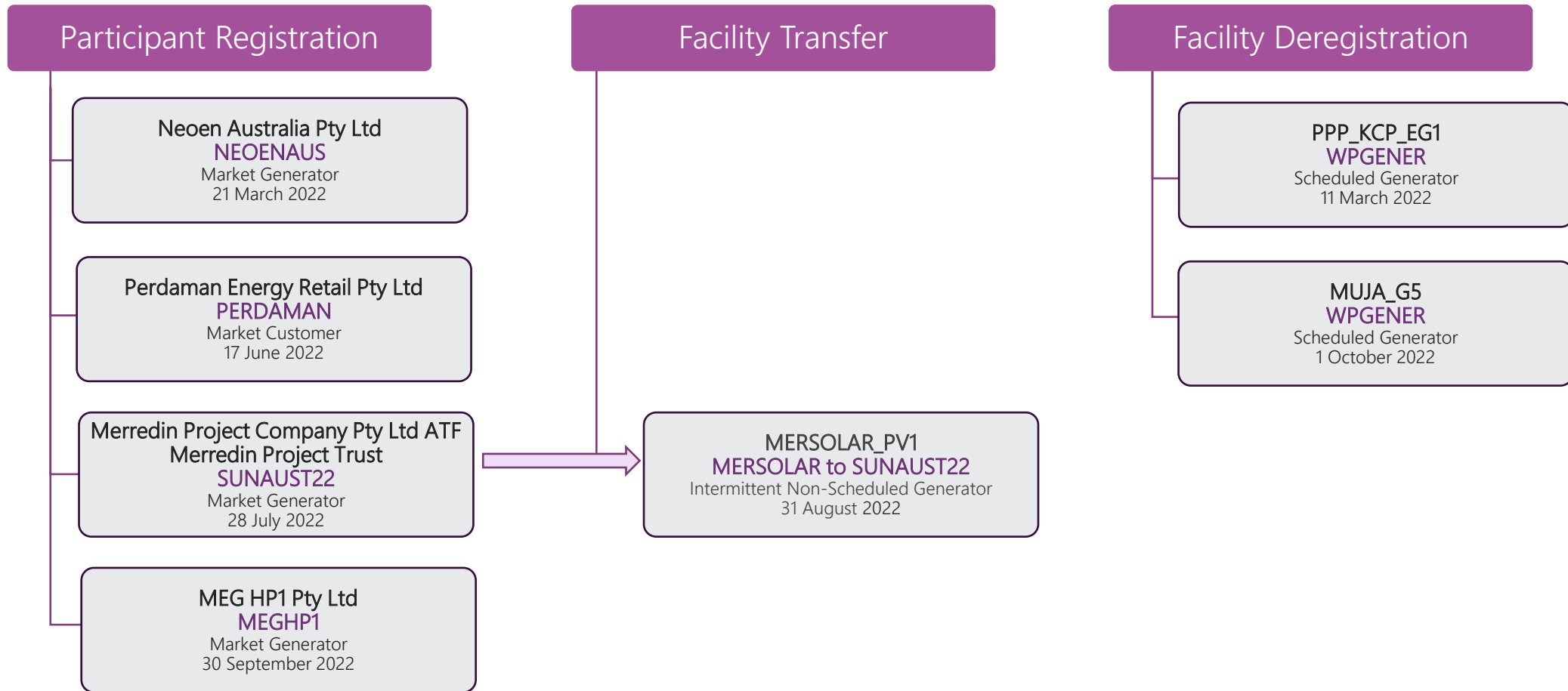
- “Balancing Price reaches four-year high”
- “Coal-fired generation decreased while gas and renewables increased”

Q3 2022



- “Weighted average Balancing and STEM price rise”
- “Coal generation decreases, gas generation increases”
- “Minimum operational demand and maximum distributed PV output record”
- “Request for supplementary Reserve Capacity for the 2022-23 Capacity Year”

WEM Registration Activity



WEM System Releases

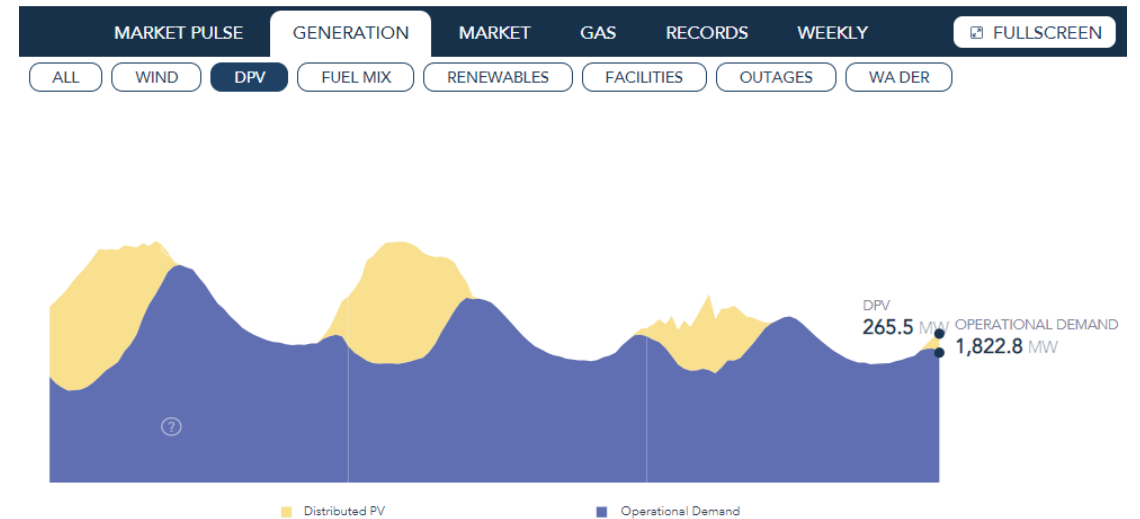
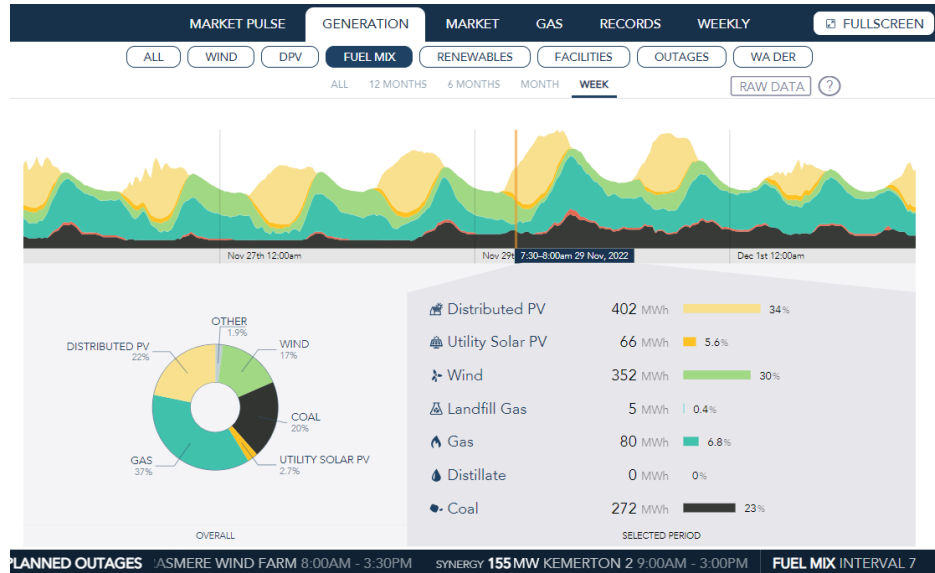
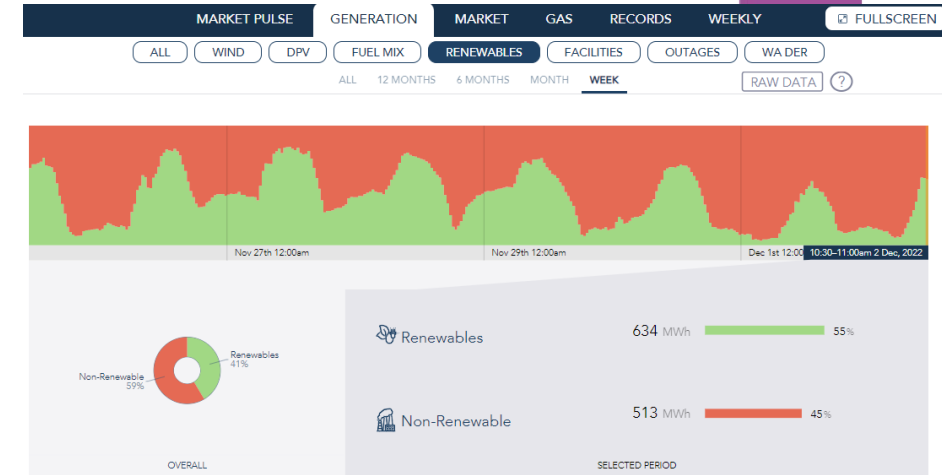
WEM PaSS 2.0

28 April 2022

- This release included a major upgrade to the underlying framework of WEM PaSS to .NET 5.
- A number of internal and external minor bug fixes and improvements were also addressed.

Data Dashboard Uplift

- Publication of estimated DPV data
- EOI demand and non-scheduled generation into the balancing price graph
- 'Fuel Mix' visualisation uplift, showing operational demand split by different fuel types overtime
- 100% renewable tracking every 30 minutes, as a measure of underlying demand
- 'Records' tab, showing 12 historic records, e.g. Maximum DPV Generation



WEM Training

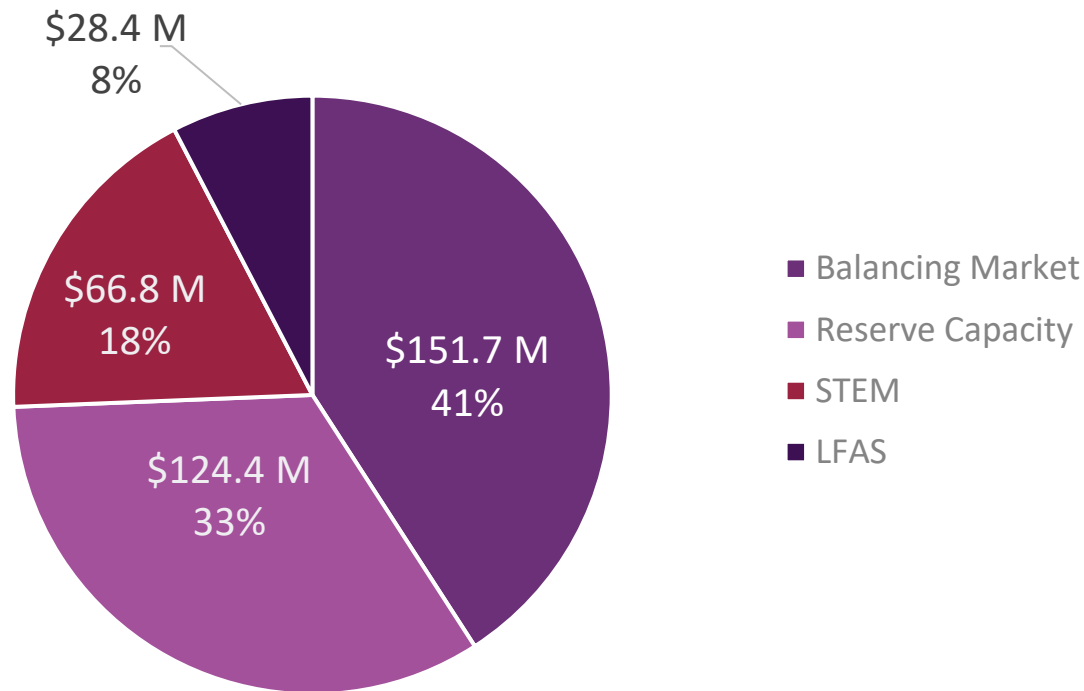
- AEMO ran 20 WEM specific training courses over 2022
 - 10 WEM Overview
 - 5 Reserve Capacity Mechanism and
 - 5 WEM Power Systems and Energy Markets
- With a total number of attendees across all three courses of **591**
- Overall feedback rating for 2022 is **9.5/10**

WA Prudentials & Settlements

Sonja Ingwersen – Market Analyst

Settlements 2022

Value of WEM Markets, 2022 to-date



- Total value of the WEM markets traded through AEMO in 2022 (to-date) is \$371.3M
- Balancing was the highest value segment, making up 41% of this value, followed by Reserve Capacity at 33%.

Includes Non-STEM Trading Months Jan-Sep 2022 and STEM Trading Weeks 1-47, 2022.
 Excludes value of Bilateral energy and Reserve Capacity, self-consumption, and Ancillary Services other than LFAS.

Reduced Credit Limit Requirements

- Procedure changed in February 2022 following participant proposal and a consultation period.
- Considers more recent data and the correlation between Non-STEM and STEM.
- Changes more accurately reflect participant exposure to the market, resulting in:
 - Lower amount of Credit Support held
 - No material increase in exposure risk to Market

Data considered in assessment

24 months



12 months

Limit determined by

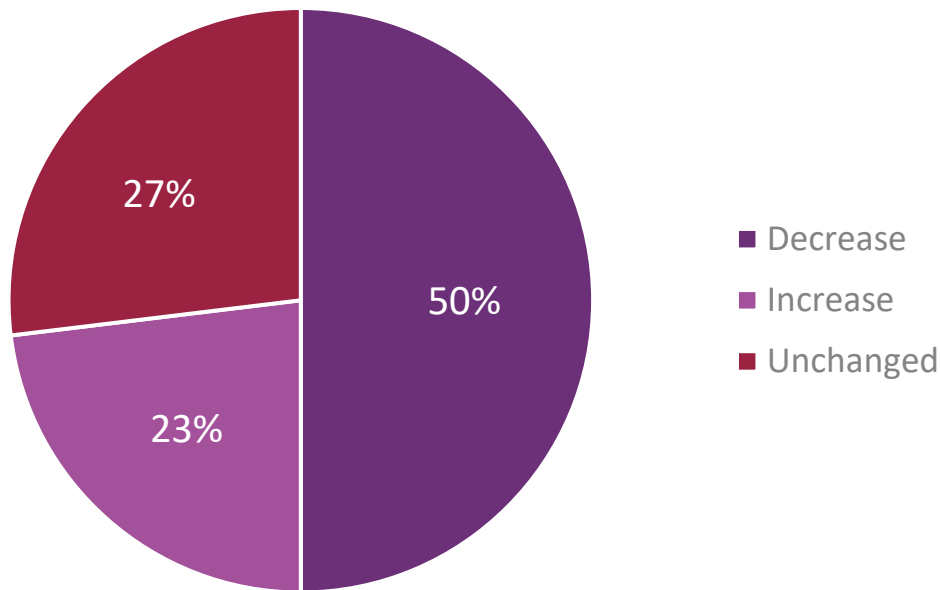
Uncorrelated Maximum Non-STEM and STEM exposure



Correlated Maximum Non-STEM and STEM exposure

Reduced Credit Limit Requirements

Credit Limit review outcomes by number



- Credit Reviews completed in March 2022 with the new methodology resulted in¹:
 - 50% of Participants' Credit Limits decreased.
 - 27% of Participants' Credit Limits were unchanged.
 - Overall reduction in Credit Limits of \$1.4m

1. Excluding Market Participants who never have negative exposure and therefore have a calculated Anticipated Maximum Exposure of \$0.00

Disaggregated Adjustment Invoices

- Following consultation, Non-STEM Adjustment Settlements are no longer aggregated as of February 2022.
- Participants now submit one Austraclear trade for each Adjustment Invoice, rather than one trade for the net aggregate of three Adjustment Invoices.

Benefits

Allows AEMO to determine which Invoice a Payment Default relates to

Ensures AEMO's ability to short-pay the market

Ensures AEMO's compliance with clause 9.24.3A of the WEM Rules

Market Development



WA Market Development

2022 Activities

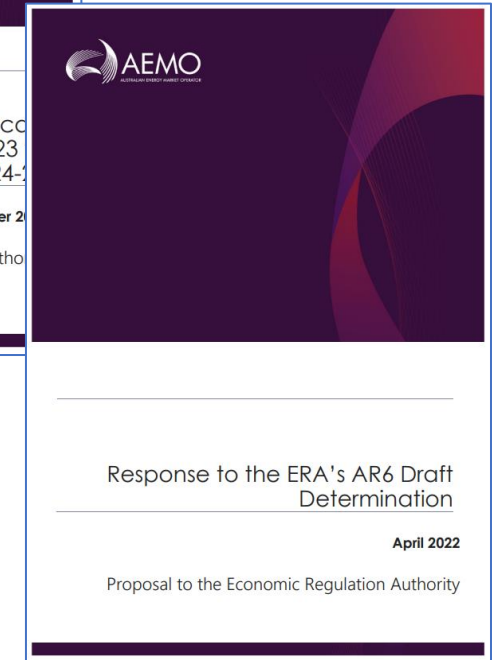
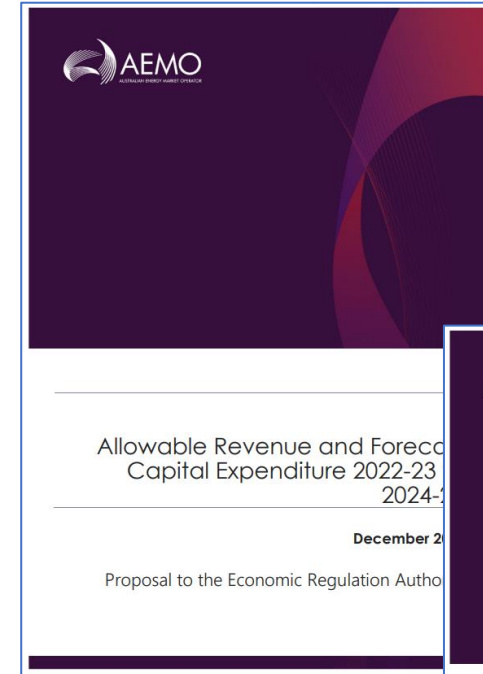
- ✓ AR6 submission
- ✓ 19 WEM Procedures developed and reviewed!

Policy support and Regulation activity

- ✓ GSI Trucking Rule Change
- ✓ CAR and RCM Review
- ✓ MAC and GAB support
- ✓ Tranche 6 Rules
- ✓ Responses to submissions

2023 Will be a busy year

- Assisting EPWA in the development of RCM Review, CAR, Project Eagle, Market Power Mitigation
- Creating, updating and publishing the 55 WEM procedures required for WEM Reform
- Corporate project updates to commence with our Finance systems, cyber technical capabilities
- First stage of 5MS expected to commence (Metering upgrade)



WA Distributed Markets

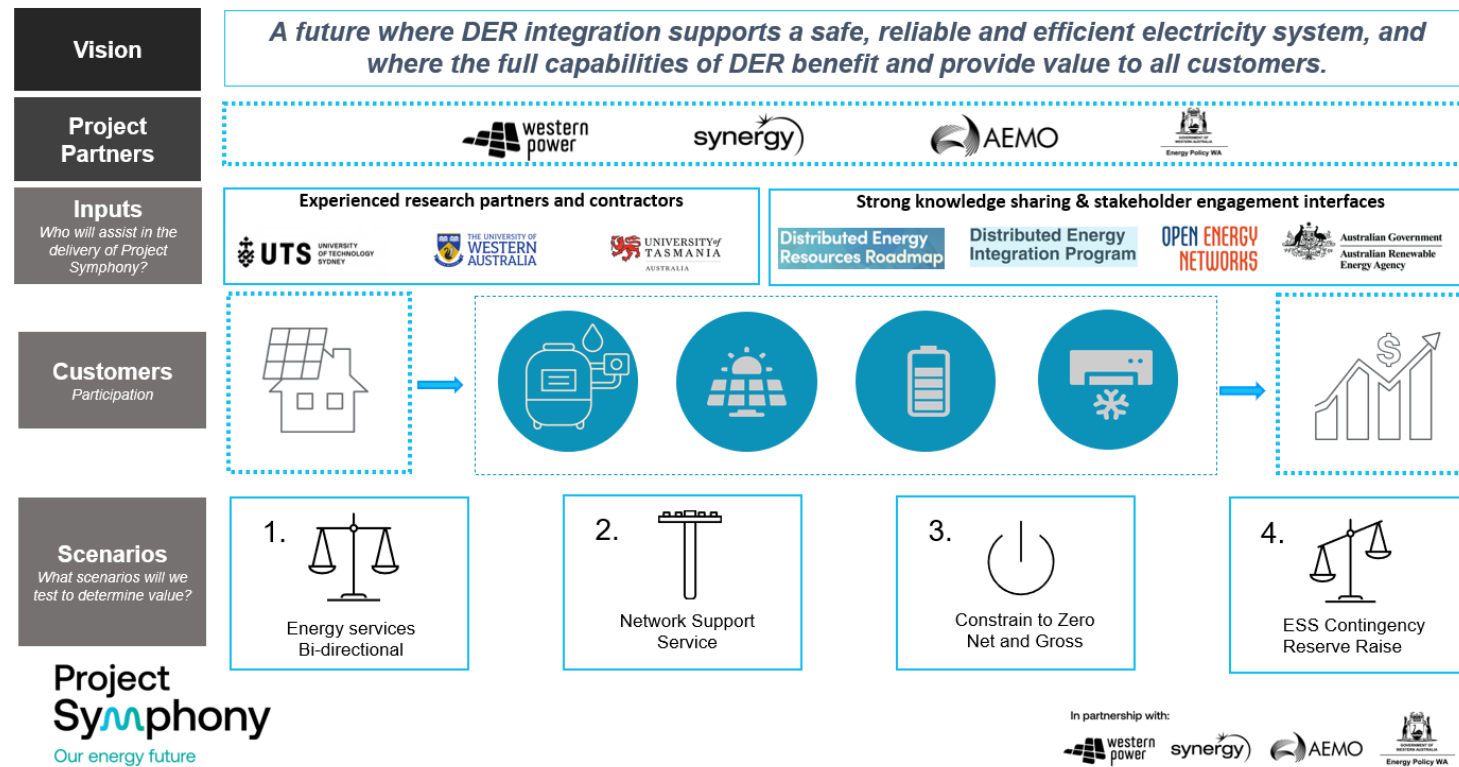
2022 Activities

- ✓ Emergency Solar Management went live, implementing a form of DER management in the SWIS.
- ✓ Identified need for and developed VPP visibility framework to better enable stakeholders to develop DER aggregation capability whilst supporting AEMO's management of the security and reliability of the SWIS.
- ✓ Established AEMO's DER Integration Platform for Project Symphony from MVP to operational pilot and developed four test scenarios with project partners.

Coming up in 2023

- Implement updates to AEMO's DER Register to enable visibility of Electric Vehicle chargers.
- Complete Project Symphony testing and undertake detailed implementation planning as required under the DER Roadmap.

Project Symphony – Scope and Objectives

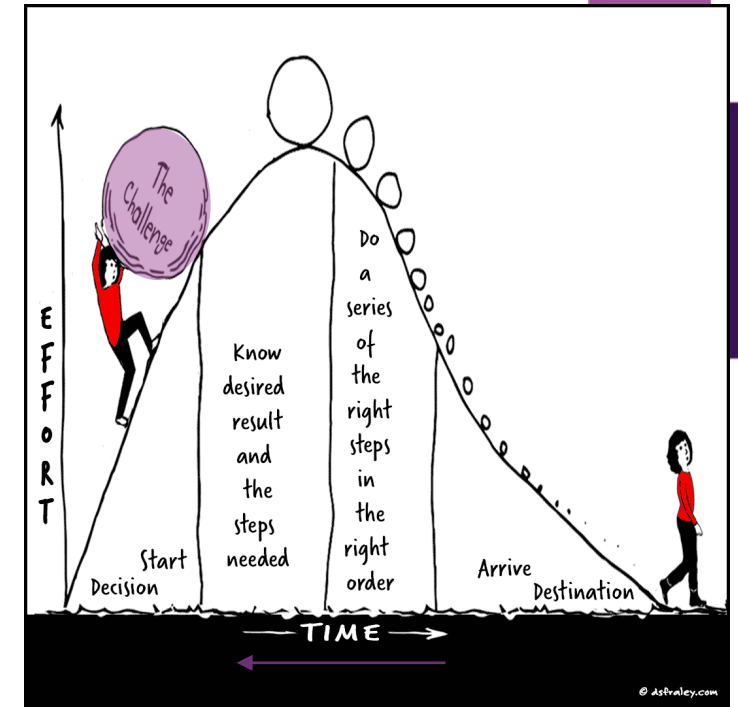


Reserve Capacity

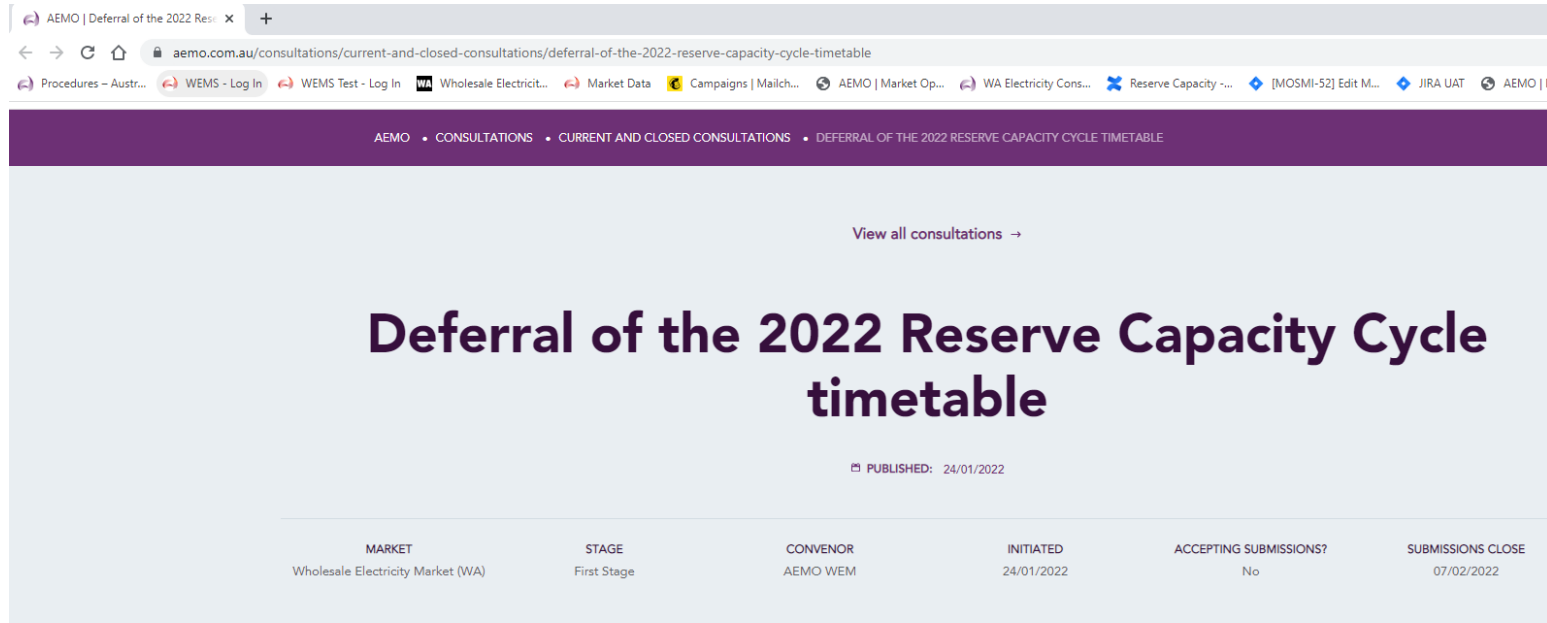
Bindi Shah, Senior Analyst



How we describe the year...



2022 Reserve Capacity Cycle Deferral



The screenshot shows a web browser window with the URL aemo.com.au/consultations/current-and-closed-consultations/deferral-of-the-2022-reserve-capacity-cycle-timetable. The page title is "Deferral of the 2022 Reserve Capacity Cycle timetable" and it was published on 24/01/2022. Below the title is a table with the following data:

MARKET	STAGE	CONVENOR	INITIATED	ACCEPTING SUBMISSIONS?	SUBMISSIONS CLOSE
Wholesale Electricity Market (WA)	First Stage	AEMO WEM	24/01/2022	No	07/02/2022

Consultation Paper

On 26 February 2021, AEMO published the current [2022 Reserve Capacity Cycle timetable](#), which requires implementation of the Network Access Quantity (NAQ) framework. The NAQ framework provides a mechanism to assign Capacity Credits in the new security constrained market design, using a NAQ Model. A Facility's NAQ reflects its physical capability limit, network access limit, and prioritisation order in receiving network access during peak demand periods.

AEMO may modify or extend the current 2022 Reserve Capacity Cycle timetable, in accordance with the clause 1.36B.3 of the Wholesale Electricity Market Rules (WEM Rules).

AEMO is consulting with Market Participants and interested stakeholders to determine potential impacts of deferring key activities of the current 2022 Reserve Capacity Cycle timetable. It is AEMO's view that extending key activities of the current 2022 Reserve Capacity Cycle will allow:

Expression of Interest

Mandatory Process

Technology Type ^A	Unit of Measure	2022-23 Capacity Year	2023-24 Capacity Year	2024-25 Capacity Year
Total Submissions	#	3	29 ^C (867% ↑)	164 ^D (466% ↑)
Intermittent Generating Systems(IGS)	MW	165	84	398
IGS + Electric Storage Resources (ESR)	MW			125
Non-Intermittent Generating Systems (NIGS)	MW	29	15	32
NIGS + ESR	MW			82
ESR	MW	-	196	674
Non-Dispatchable Load	MW	-	5	
Potential capacity provided by EOIs ^B	MW	62	301	1,311

- A. The 2022-23 Capacity Year only had Facility Types which included Intermittent Generators, Non-Intermittent Generators, and DSM. The 2023-24 Capacity Year onwards has a Facility Class, and Technology Type.
- B. The figures have been adjusted from the nameplate capacity figures provided by the project proponents to account for an estimate of the Relevant Level IGS.
- C. Multiple submissions for same Facility or upgrade. Duplicates are removed and only 25 submissions remaining.
- D. Multiple submissions for same Facility or upgrade. Duplicates are removed and only 91 submissions remaining.

Indicative Facility Class Assessment

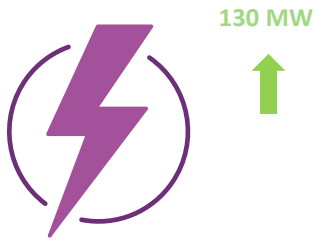
Criteria	Count	Total # EOI's of Facilities created in WEMS (existing/upgrade/new) ^A	Candidates for Registration for the 2022 Reserve Capacity Cycle
EOI Submissions	164	25	17
Unregistered Facility ^B	1	1	1
Total	165	26	18
Total of Count (%)	100%	16%	11%

- A. This includes the Facilities that submitted an EOI for the 2022 Reserve Capacity Cycle (RCC) and were created/existed in WEMS. Upgrades are included in the total count and do not require a new Facility to be created in WEMS. These Facilities can progress to the Certified Reserve Capacity application process in addition to Facilities assigned Capacity Credits in the 2021 RCC.
- B. Unregistered Facility that was assigned Capacity Credits in the 2021 RCC and submitted an indicative Facility Class Assessment application.

2021 CRC

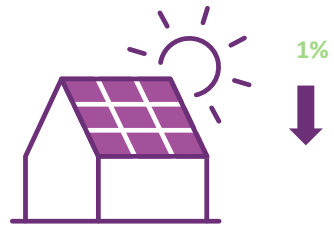
- First RC Cycle where the new RCM Facility Class and technology types were implemented.
- 4726.572 MW of Capacity Credit were assigned or the 2023/24 Capacity Year:
 - 4418.746 MW - Non-Intermittent Generating System
 - 161.283 MW - Intermittent Generating System
 - 46.25 MW - Energy Storage Resource (ESR)
 - 16.52 MW - Non-Scheduled Facility
 - 83.773 MW - Demand Side Program
- The first standalone ESR was assigned 46.25 MW of Capacity Credits (46.25 MW)

2022 WEM ESOO (2024-25 Capacity Year)



4,526 MW

Reserve Capacity Requirement



7% annual growth rate

DPV Capacity



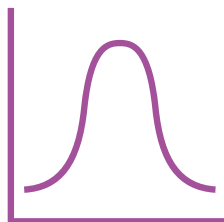
0.9% growth rate

10% POE peak demand

Key Takeaways:

- Sufficient capacity to meet demand until 2024-25.
- Capacity shortfall from 2024-25 (Muja C unit 6 retirement)

...but the situation is changing



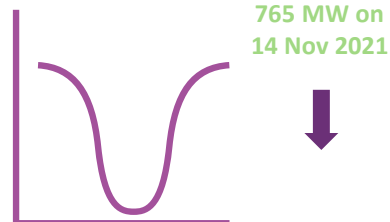
18:00 to 19:00

Peak Demand



↘ 0.3% annual rate

Operational Consumption



11 MW by 2026-27

Minimum Operational Demand



\$165,700/ MW

Benchmark Reserve Capacity Price

Supplementary Reserve Capacity

SRC process activated first time since 2006, where a potential shortfall of 174 MW was identified for the 2022-23 Capacity Year.



Existing challenges with coal supply, which may not be resolved in the near-term



Long-term outages and project delays



Stronger than forecast demand growth

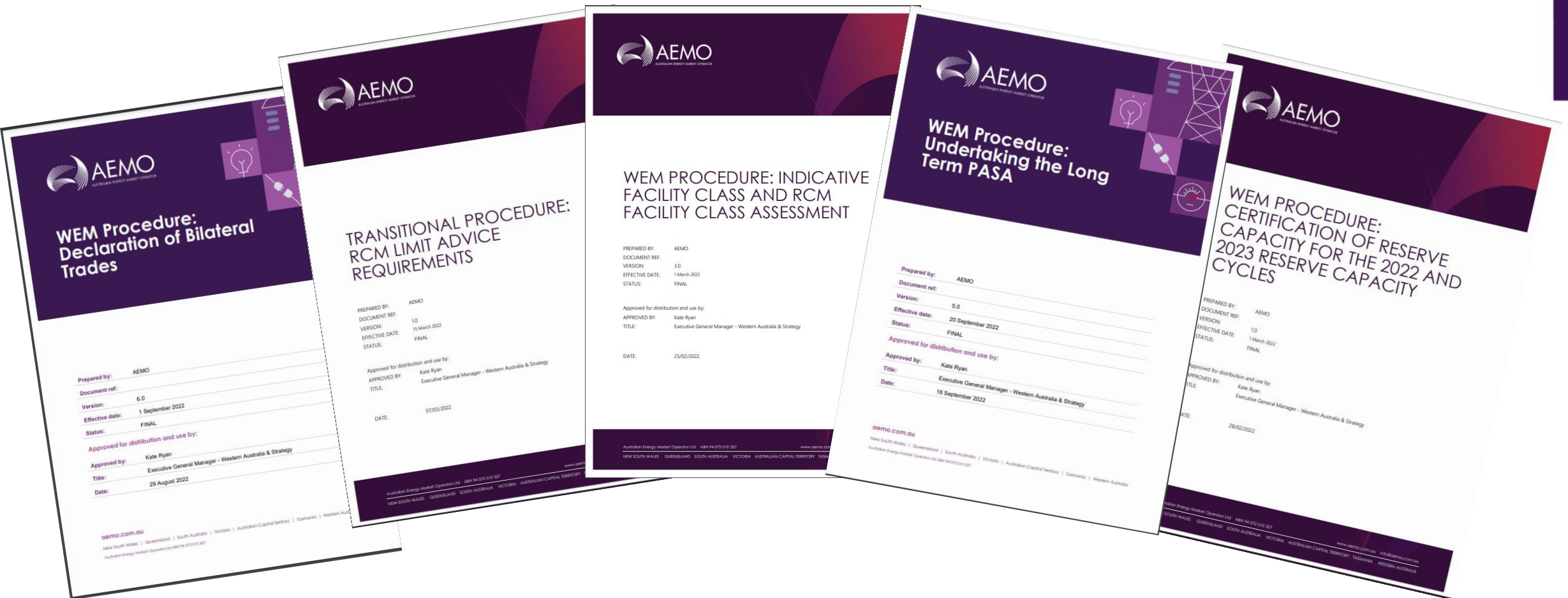
2023 WEM ESOO Activities

The 2023 WEM ESOO development is underway.

- Supporting forecasts being wrapped up and scheduled to be published as part of AEMO's Draft 2023 Inputs, Assumptions, and Scenarios Report (IASR)* by December.
 - BIS Oxford Economics – Economic and population growth outlook
 - CSIRO/Green Energy Market – Distributed PV and batteries uptake projections
 - CSIRO – Electric Vehicles uptake projections.
 - CSIRO/Climateworks Centre - Multi-sector modelling
- Development of the reliability assessment is in progress with the procurement to be completed in Jan 2023 and the focuses on:
 - Improving expected unserved energy forecasting methodology.
 - Incorporating challenges emerging in the capacity supply.
- Energy and demand forecasts are to be kicked off in Jan 2023 with increased efforts on:
 - Incorporating the impact of electrification, energy efficiency, and fuel switching as a result of more substantial decarbonisation commitment.
 - Stakeholder communication and engagement to improve forecasting and data transparency.

** The Draft 2023 IASR report details how AEMO will model the future in its forecasting and planning publications for 2023 and 2024. It is a publication for the National Electricity Market, but includes the IASR to be applied for the 2023 WEM ESOO development.*

Updates to Wholesale Electricity Market Procedures (WEMP) - RCM



RCM WEMS Releases

RCM 1.27

- Trade Declaration
 - Changes to reflect the introduction of components
 - Alignment with new registration network

RCM 1.29

- CRC
 - Include NAFF nominations, NCESS, Minimum Stable Loading Level.
 - Removal of redundant fields.

Questions and Feedback

WAElectricityforum@aemo.com.au

Upcoming forums and working groups

WEM Reform Implementation Group (WRIG)
8 December 2022

WA DER Participation Forum
14 December 2022

WA Electricity Consultative Forum (WAECF)
22 February 2023