

Consumer Forum

12 September 2023

Emily Duck, Manager,
Consumer and Community



In the spirit of reconciliation, we acknowledge the traditional owners and custodians of this land, who have walked and cared for it for thousands of years, and their descendants who maintain their spiritual connection and traditions.

We thank them for sharing their cultures, spiritualities and ways of living with the land, in this place we all call home.

We pay respect to elders past, present and emerging.

May we walk gently and respectfully, together.

Lands of the Wurundjeri Woi-wurrung and Bunurong Boon Wurrung Peoples of the Eastern Kulin

Today's agenda

Time	Item	Speaker
11:00 am	Welcome and Acknowledgement of Country	Emily Duck, Manager, Consumer and Community
11:05 am	Overview of AEMO's FY24 Corporate Plan	Kate Ryan, Executive General Manager, Western Australia and Strategy
11:30 am	Survey results on AEMO's stakeholder engagement	Matthew Myers, Group Manager, Stakeholder Engagement
11:50 am	2023 Electricity Statement of Opportunities	Ben Jones, Manager, Reliability Forecasting
12:15 pm	NEM Reform update	Chris Muffett, Manager, Wholesale Reform Delivery
12:30 pm	Update on issues of interest <ul style="list-style-type: none">Wholesale Demand Response MechanismFive Minute Settlement (5MS)	Nicole Dodd, Manager, DER and Retail Reform Chris Muffett, Manager, Wholesale Reform Delivery
12:55 pm	Other business and next meeting	Emily Duck, Manager, Consumer and Community

Housekeeping

- This session is being recorded
- Muted unless talking, thank you
- Q&A function available – groups relevant questions and comments
- Ask questions via the chat function throughout
- We will endeavour to follow up questions we do not get to in session
- Respectful and relevant
- Equal opportunity to engage

Last time we met...

- Request for AEMO to respond on the costs of 5-minute settlement and to provide an update on the wholesale demand response mechanism
 - We will provide an update on both items today
- Request to receive Forum agendas and papers at least five working days ahead.
 - We agree and will work to improve and circulate pre-read materials five days prior.
- Suggested a brief meeting summary is created for each meeting.
 - Meeting summary of the June Consumer Forum is available on our [website](#).
- Need help with terminology? Here's a handy [list](#).

Strategic Corporate Plan FY24

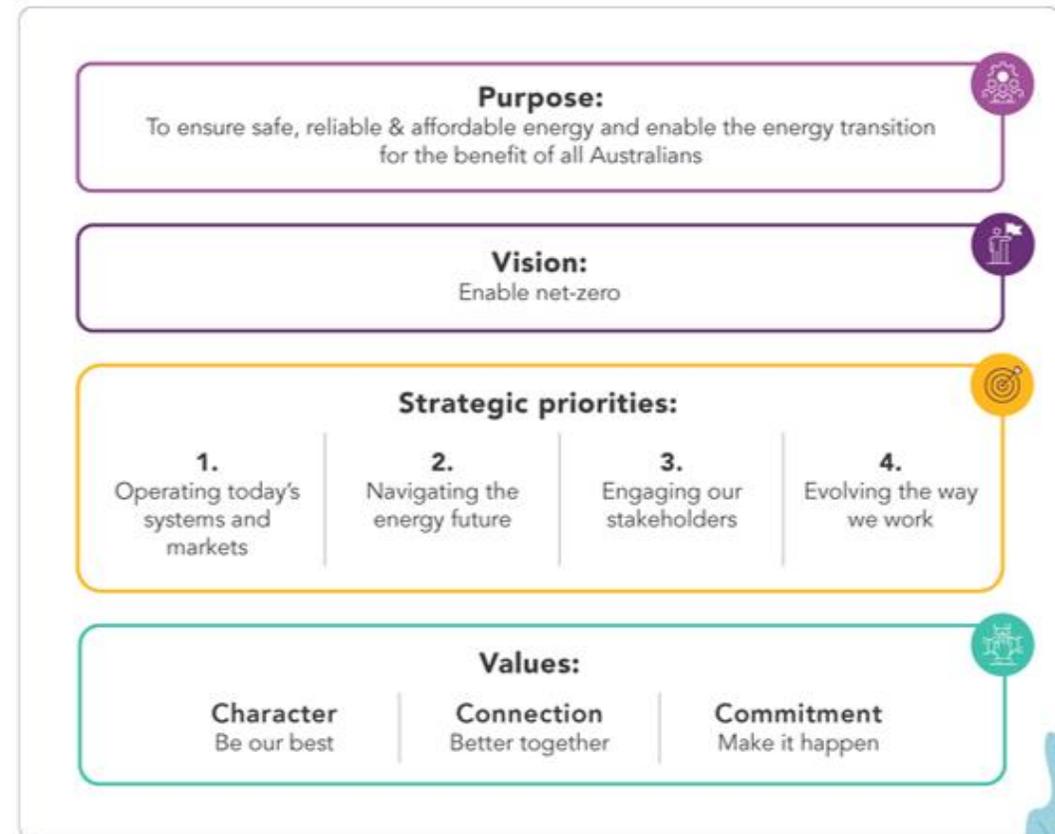
Kate Ryan

Executive General Manager,
Western Australia and Strategy



AEMO's strategy

- **An ambitious vision of success** – a secure, reliable, low-cost pathway to a net-zero energy system
- Our guiding framework outlines how we achieve this vision in **AEMO's strategy**
- **Our purpose and vision** describe our 'reason for being' and what we strive for, respectively
- **Our four strategic priorities** articulate how we deliver on our purpose and vision
- **Our values** articulate the core set of beliefs and behaviours that guide the way we work



We will invest our resources to operate the energy markets and grid in the long-term interest of consumers

- Funded by participants to support the delivery of the electricity and gas objectives – recognise our responsibility to be prudent and to use resources efficiently and effectively, to be transparent and accountable
- Maturing our systems, processes and building the capabilities and culture we need to support the efficient and transparent delivery of outcomes in the dynamic environment we operate in
- Our core role is becoming more complex – challenging operational conditions in both gas and electricity, and a dynamic planning environment
- AEMO's roles and responsibilities have been increasing as Australia's energy transition is accelerating

AEMO's financial principles



Efficient and cost-effective delivery



Balanced and sustainable cost recovery



Clear, ringfenced participant and member funds



Funding pathways for new investment



Very low tolerance for funding risk on contracted activities



Debt-to-assets ratio < 100%



Liquidity ratio > 50%



Timely provision of AEMO budgets to market participants

AEMO's four strategic priorities for FY24 through to FY30

	● ————— FY24 —————>	● ————— Medium-term —————>	● ————— FY30 —————>
 <p>Operating today's systems and markets</p>	<p>A secure and reliable energy system, every day AEMO has prepared for and managed operational changes for the next 12 months, including embedding market and system changes, managing increased renewable penetration and scheduled generation retirements, and strengthening its core systems to be more resilient, including to cyber threats.</p>	<p>A secure and reliable energy system, every day Through generation retirements, less reliable operation of ageing generators, gas and fuel supply challenges, and changing demand profiles – the lights are kept on, gas continues flowing, and markets keep trading with minimal AEMO intervention.</p>	<p>A secure and reliable energy system, every day Secure and reliable gas and electricity systems and markets, that are resilient to challenges of future operating environments.</p>
 <p>Navigating the energy future</p>	<p>AEMO has planned and enabled critical infrastructure delivery and market reforms AEMO has enhanced integration of gas and electricity in the 2024 Integrated System Plan, sought to enhance the regulatory frameworks for transmission investment, and progressed infrastructure delivery in its jurisdictional roles. AEMO has helped deliver business and digital solutions for in-progress reforms, and worked with stakeholders to develop the design of critical reforms.</p>	<p>AEMO has an aligned plan of changes through to net-zero energy systems AEMO has an aligned plan of infrastructure, engineering, and digital changes through to net-zero energy systems, with AEMO delivering its responsibilities to plan (including influencing and helping to deliver market reform, and enabling infrastructure delivery).</p>	<p>Australia's net-zero energy plans defined and on track AEMO has articulated the engineering, digital, and infrastructure roadmap as part of a holistic, least-cost pathway to net-zero energy. Market reforms are developed and implemented to support the transition.</p>
 <p>Engaging our stakeholders</p>	<p>AEMO has enhanced trust and delivered value to stakeholders AEMO has enhanced trust by clearly delivering value to consumers, members and stakeholders; partnered with jurisdictions to achieve positive energy transition outcomes; and helped to build social licence for the energy transition.</p>	<p>AEMO is a trusted partner and builds confidence in the energy transition AEMO is a trusted partner to governments, industry, and consumers, and has worked with partners to improve public trust and confidence in the energy transition.</p>	<p>People are at the centre of the energy transition AEMO is trusted by governments, the energy industry, homes, and businesses, and there is alignment on the pathway to achieve the energy transition.</p>
 <p>Evolving the way we work</p>	<p>AEMO has modernised its systems, evolved its culture, and improved financial health AEMO has modernised its systems and evolved its culture to make AEMO an even better place to work. AEMO has managed costs and reduced its accumulated deficit in NEM Core in line with the agreed fee pathway and budget.</p>	<p>AEMO has transformed into an even better place to work and operates within the parameters defined by its members AEMO has transformed by evolving its day-to-day practices in line with its values, becoming a safer and more inclusive organisation, modernising its core systems, building the capabilities of its workforce, and embedding the financial discipline to operate within the parameters defined by its members.</p>	<p>AEMO is fit and capable of enabling the next era of the energy transition AEMO has the technical, systems, data, and people capabilities fit for its role in 2030; operates within the boundaries set by its members; and is a great place to work.</p>

Major initiatives for each priority

 <p>Operating today's systems and markets</p>	<p>Our most fundamental task is to keep the lights on and the gas flowing, matching energy demand and supply in real time around the clock and settling trades between wholesale energy sellers and buyers. In order to keep doing this dependably into the future, AEMO operating systems require modernising.</p>
 <p>Navigating the energy future</p>	<p>Using and sharing the intelligence gathered in preparing electricity and gas outlooks, quarterly market insights, technical reports, the ISP and Engineering Roadmap, AEMO's reports provide unique insights into market and system dynamics. AEMO is also collaborating with regulatory bodies, participants and consumers on new and ongoing reforms to develop and deliver the least-cost and lowest-risk outcomes for consumers.</p>
 <p>Engaging our stakeholders</p>	<p>Building trusted relationships between AEMO and governments, industry, business, communities and consumers. It is vital AEMO shares with its diverse range of stakeholders the challenges the energy transition presents and work together to find solutions.</p>
 <p>Evolving the way we work</p>	<p>Leading with our refreshed values of Character, Connection, and Commitment to harness our expertise, build trusted relationships and get what needs to be done within AEMO. AEMO is reworking and streamlining processes, devolving financial delegations, and aiming to improve the ease with which people work with.</p>

For more information, please refer to the full [Strategic Corporate Plan on our website](#).

Annual Stakeholder Engagement Perception Survey

Matthew Myers

Group Manager, Stakeholder
Engagement



Background

Purpose

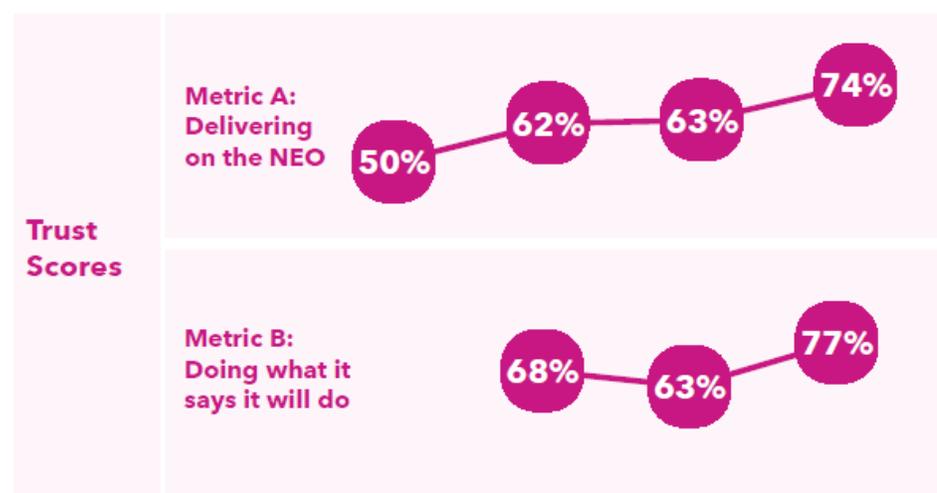
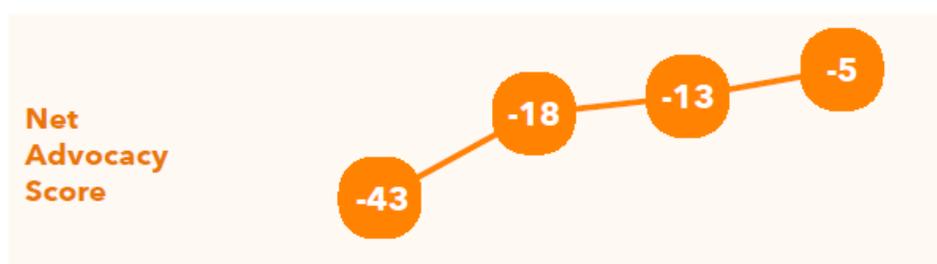
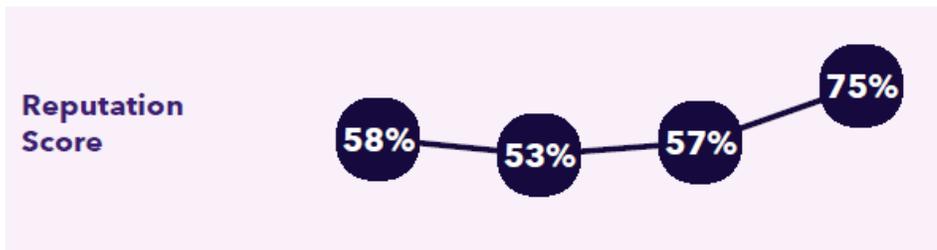
- Fourth wave of annual stakeholder research conducted by SEC Newgate for AEMO.
- This research guides AEMO's understanding of what is driving our reputation with key stakeholders, where we are doing well and where we can focus efforts for improvement.

Methodology

- More than 50 participants engaged as part of the research – mix of in-depth interviews and online.
- All were asked the same rating questions.
- Participants represent 10 key stakeholder segments, including Consumer Advocates.
- Weightings are applied if necessary to all stakeholder groups to ensure group results are quantitatively equal.
- Feedback provided by participants is done so anonymously. AEMO cannot identify which participants provided what feedback.

Quantitative results

	2020 (n=40)	2021 (n=34)	2022 (n=37)	2023 (n=52)
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Performance against key reputation indicators (% who rated AEMO 7 or more out of 10)	2020	2021	2022	2023	Point change 2023 to 2022
The quality of your relationship with AEMO	73	91	86	91	+5
Effective operation of Australia's energy market, i.e., helping to keep the lights on	90	97	92	88	-4
Providing you with timely, accurate and easily understood information~	54	71	70	76	+6
Working collaboratively with other stakeholders to help shape and plan Australia's energy future	50	55	62	75	+13
Being accountable to its members*	35*	48	49	73	+24
Being transparent*	35*	52	46	67	+21
Efficient operation of Australia's energy market, i.e., provides value for money	37	57	33	58	+25
Efficient energy market planning, i.e., spending money on the right things	48	69	35	51	+16

TABLE LEGEND
 * In 2020 this was one attribute: 'being transparent and accountable'
 ~ In 2022/23 this was calculated as an average of performance ratings 7+ for 'its information being easy to understand', 'providing information and reports in a timely manner' and 'the accuracy of its information and analysis'
 + In 2022/23 this was calculated as an average of performance rating 7+ for 'being accountable to its industry members' and 'being accountable to its federal and state government members'

Quantitative results by segment

Overall Reputation by segment (0 to 10 scale)	Average Rating	
	2022	2023
All stakeholders	6.2	6.8
Government and Market Bodies	7.5	7.2
Generators: Renewables	4.6	6.3
Generators: Coal and Gas	N/A	6.5
Transmission Network Service Providers ('Networks' in 2022)	6.6	6.3
Distribution Network Service Providers ('Networks' in 2022)		7.4
Retailers	N/A	5.6
Gentailers	5.8	N/A
Industry Associations	6.0	7.2
Consumer Advocates	5.4	7.3

- Segments for this year’s study were amended from 2022: Government and Market Bodies combined, ‘Networks’ split into Transmission Network Service Providers and Distribution Network Service Providers, specific segments added for Generators: Coal and Gas and Retailers and Gentailers removed as a segment.
- Green text denotes statistically significant changes from 2022 (at least +/- 1.0 points)

General themes – qualitative feedback

Our core strengths

- Confidence in AEMO's leadership
- Handling of the 2022 market suspension
- Improvements in stakeholder engagement and communications
- Trusted advisor particularly to government
- Enhanced onboarding of talent with energy industry experience who bring a more realistic/pragmatic approach to understanding industry stakeholders needs and nuanced appreciation of commercial impacts of our decisions

Where we can improve

- Operations and financial management – e.g. the need to explain our spending and investment decisions better
- Operating within our core remit and not 'overstepping' on policy making
- Speed and bureaucracy in decision-making and risk adversity
- Balancing a high safety and reliability focus with cost-efficiencies and affordability for consumers
- Adopting a more pragmatic and balanced (versus overly engineering-focused) approach to meet the needs of the fast-paced energy transition
- Authenticity in stakeholder communications, engagement and consultation

Consumer Advocate segment

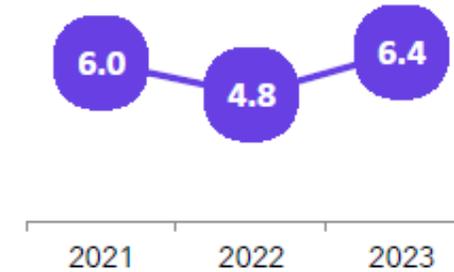
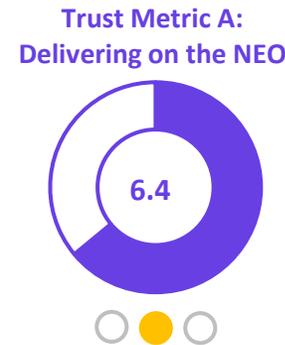
Strengths and positives:

- The Integrated System Plan (ISP) uses a well-established process, with AEMO achieving important, hard-to-reach deadlines
- Fulfils its core role of market operation well

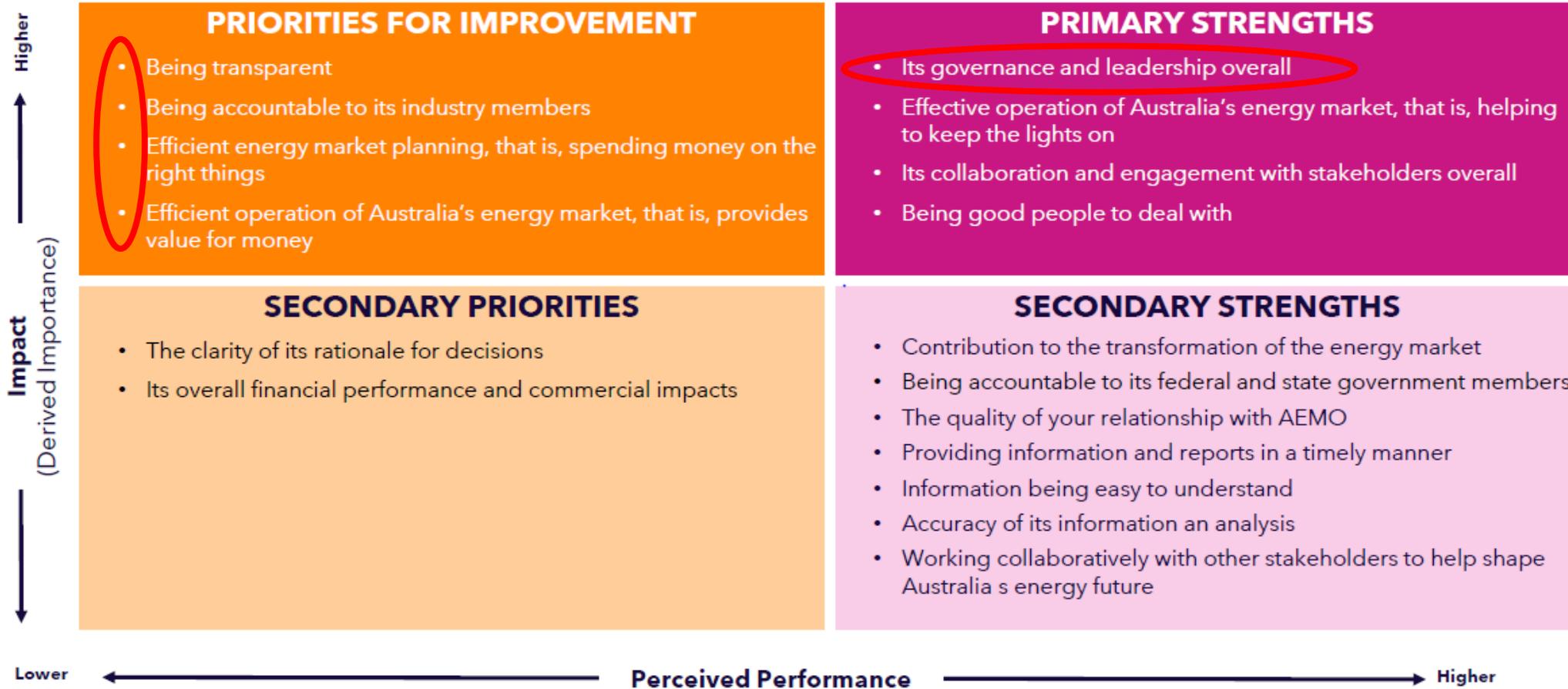
Issues and opportunities:

- An engineering culture and for some a lack of good decision-making processes or frameworks to provide transparency
- Some perceptions of poor stakeholder engagement, especially with the community
- Too politically driven – needs to consider consumer viewpoints more
- Decision-making is not sufficiently cost-conscious regarding costs passed onto consumers
- Reports are too technical and not digestible for consumers

 Denotes segment score is in line with the average 2023 overall score for all segments



Strategic action priority matrix



AEMO's top 5 key drivers of reputation and trust are circled in red:
1 is a strength, 4 are priorities for improvement.

Leveraging our opportunities

SEC Newgate identified five key opportunities for AEMO to pursue:

Leverage trust in relationships,
engage via CEO and other
senior leaders

Continue to improve
transparency, timeliness and
authenticity of communications
and engagement

Concerted focus on industry
stakeholders

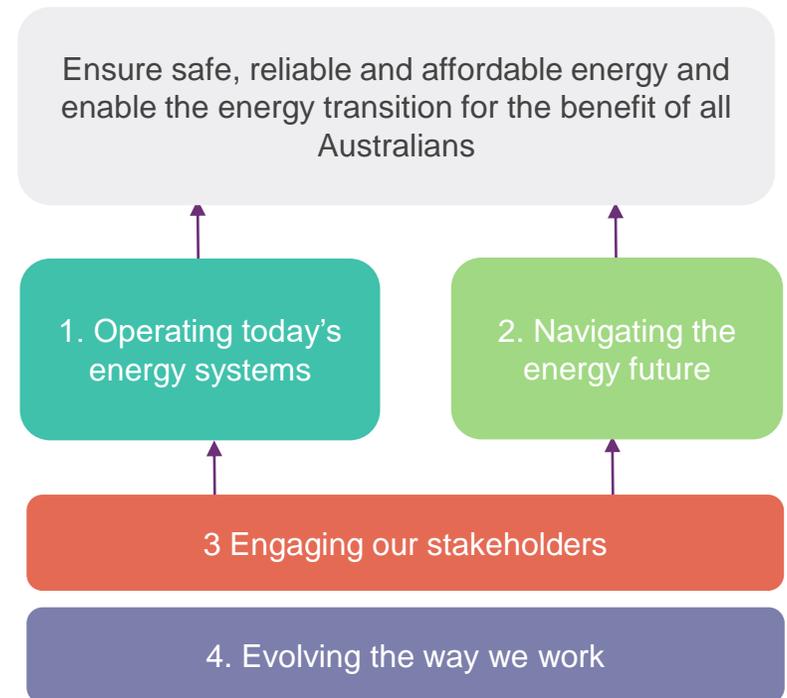
Demonstrate greater financial
rigour

Emphasise our ongoing
expertise in effective operation of
the market in our
communications and
engagement

Why engaging our stakeholders matters and how do we use the results

- Our stakeholders are critical to our success and to the success of the energy transition.
- The complexity of the transition means we have to work together to find and deliver solutions.
- To do our job better – keep the lights on and achieve the energy transition – we need to understand, influence and work with our stakeholders.
- **Trust** is the critical enabler of success for our engagement. Without it, we will not be able to perform and will lose our ability to influence and mandate to deliver.

AEMO Strategic Corporate Plan FY24



Engaging with our stakeholders

AEMO STRATEGIC CORPORATE PLAN | FY24



Engaging our stakeholders

Be a trusted partner working with our stakeholders to deliver better energy outcomes for consumers and the community.

As the energy transition progresses, the stakeholder landscape is evolving and growing. Tackling the increasingly complex challenges of the transition requires genuine collaboration and cooperation with and between market bodies, industry participants, jurisdictions and consumers.

As a trusted source of technical expertise for our stakeholders and jurisdictions, we will continue engaging transparently, openly and collaboratively to deliver the best outcome for all Australians.

AEMO is committed to contributing to the social licence needed for the transition by ensuring that consumers and communities are heard and understood, and that the distribution of benefits and costs of the transition are kept front-of-mind.

How we will achieve the outcomes of this priority:

Enhance trust in AEMO

We enhance trust by delivering value to consumers, members and stakeholders, and by working with jurisdictions and stakeholders to achieve positive energy transition outcomes.

- **Improve openness and transparency** for our stakeholders.
- **Improve accessibility of AEMO information and publications.**
- **Seek timely stakeholder input and feedback**, ensuring appropriate 'feedback loop'.
- **Ensure AEMO stakeholder engagement forums** are efficient, effective and inform AEMO's work and value.
- **Increase collaboration with stakeholders** to achieve better energy outcomes, including through industry and jurisdictional forums.
- **Uplift AEMO's stakeholder engagement capability**, including execution of the Stakeholder Engagement Maturity Roadmap.

Embed a consumer and community focus

We enhance our focus on the energy consumer and the community.

- **Develop and commence execution of AEMO's Consumer Engagement Plan.**
- **Seek to better understand consumer priorities, preferences and challenges**, particularly in the context of the energy transition.
- **Help build greater understanding and awareness** of the energy transition with consumers and the community through our communications and publications.
- **Work effectively with local communities** to deliver the VNI West and Western Renewables Link transmission projects.

2023 Electricity Statement of Opportunities

A 10-year reliability outlook for the NEM

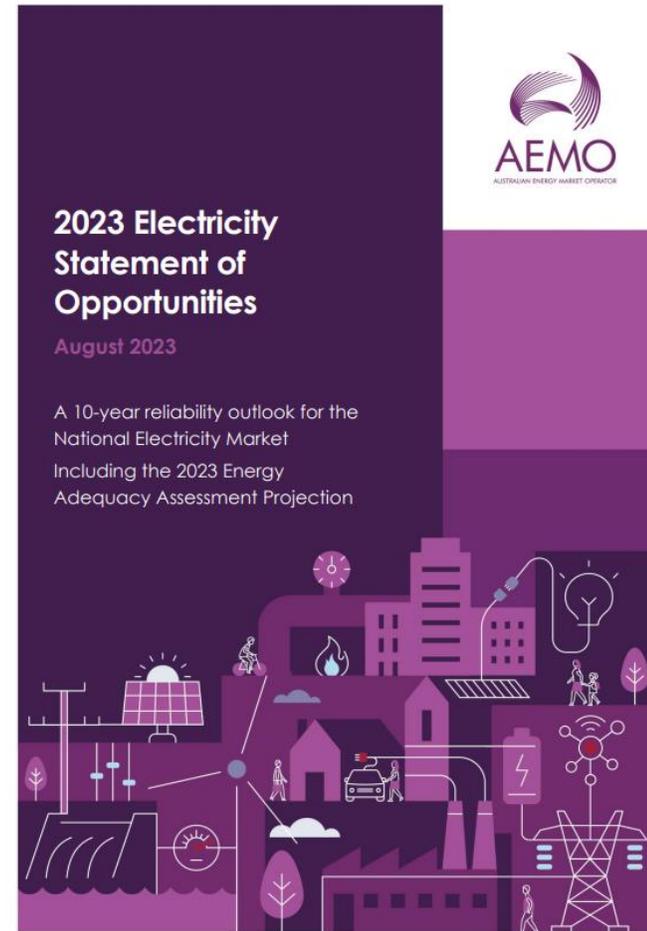
Ben Jones

Manager, Reliability
Forecasting



What is the ESOO?

- Published annually, AEMO's Electricity Statement of Opportunities (ESO) is a 10-year reliability outlook for the National Electricity Market (NEM).
- It provides information on future needs of the electricity system to ensure ongoing reliable supply of electricity to Australian homes and businesses.
- One of several publications that helps governments, industry and consumers to understand where investment is needed across the NEM to meet consumers' future needs.
- We have provided the [2023 ESO Overview](#), which is an explainer of its key findings.



The report and its supporting materials are available [here](#)

Key takeaways



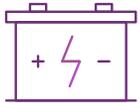
- The NEM is undergoing its largest transformation since formation, driven by the notified retirement of approximately 20% of today’s older coal and gas fleet by 2033.



- **This year’s ESOO highlights the pace of Australia’s energy transition. Urgent investment is needed to meet people’s growing energy needs and continue to deliver reliable, affordable and cleaner energy for consumers.**



- Over the 10-year ESOO horizon, reliability gaps are identified in all mainland regions. This summer is forecast to be hotter and drier than previous years and will see an elevated level of reliability risk.



- To ensure consumers continue to have access to reliable electricity supplies, it is critical that planned investments in energy generation, transmission and storage are delivered urgently.



- Transmission projects identified in AEMO’s Integrated System Plan (ISP), government initiatives, and orchestrated consumer energy resources can address many identified risks, if delivered to schedule.



- There is an opportunity for consumers’ rooftop solar, batteries and electric vehicles to actively participate in the power system to further reduce reliability risks.

Larger reliability gaps forecast in South Australia and Victoria, than in 2022

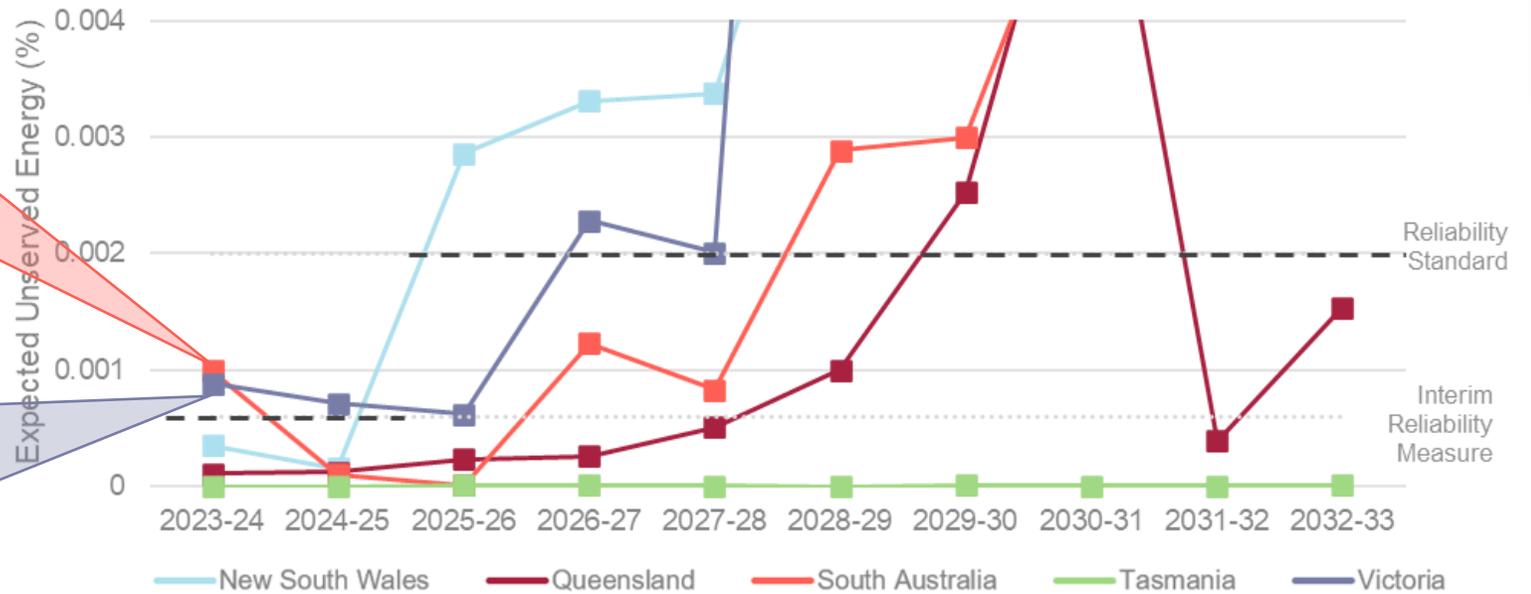
Reliability gaps forecast in South Australia in 2023-24

Why? Numerous factors including higher forecast probability of low wind with high demand conditions.

Reliability gaps forecast in Victoria from 2023-24

Why? Numerous factors including revised wind availability have resulted in the increase.

Expected unserved energy
Central outlook



AEMO uses two relevant reliability standards for jurisdictions in the NEM, which each carries a level of risk: the **Interim Reliability Measure (IRM)** and the **reliability standard**. Please see the [ESOO Overview](#) for the full definition.

Reliability gaps forecast in New South Wales and risks remain in Queensland

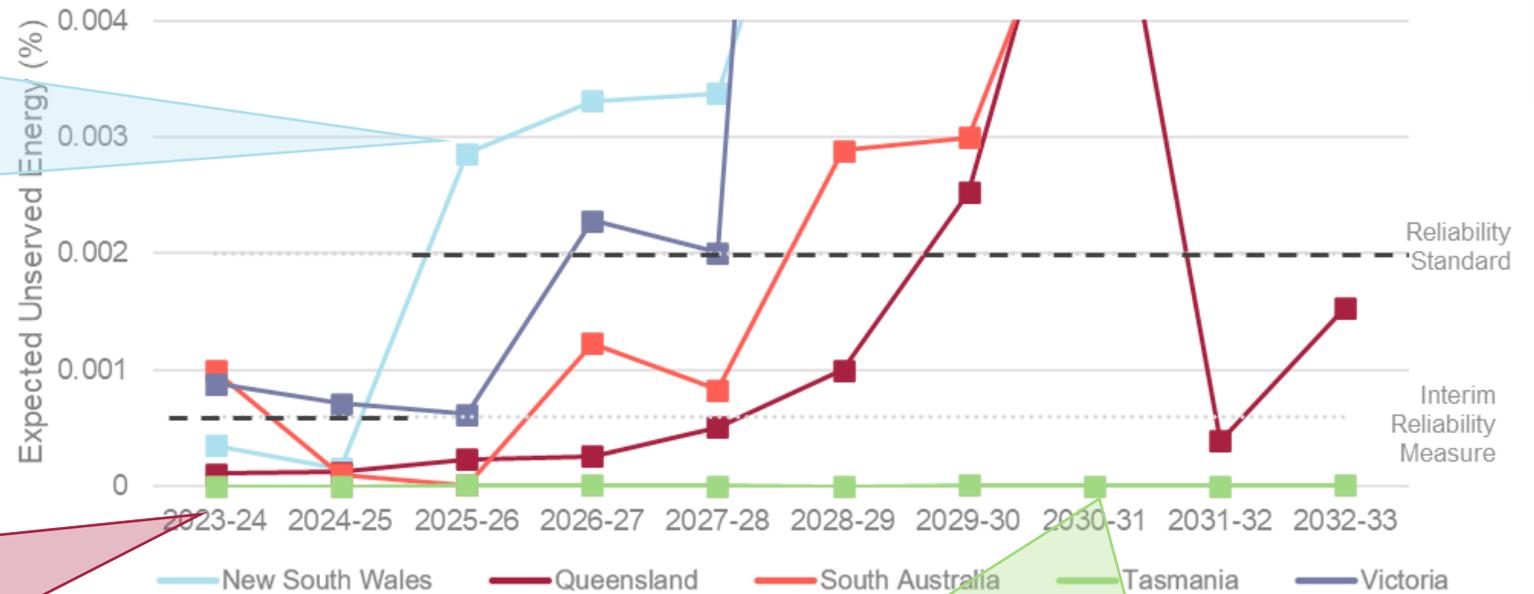
Reliability gaps forecast in New South Wales from 2025-26

Why? Risks increase when Eraring is assumed to retire, while higher demand and lower DSP forecasts also increase risks.

Reliability risks in Queensland increase from 2029-30

Why? Risks increase when Callide B retires, and as demand increases. In 2031-32, Borumba Pumped Hydro commissions, reducing risks.

Expected unserved energy
Central outlook



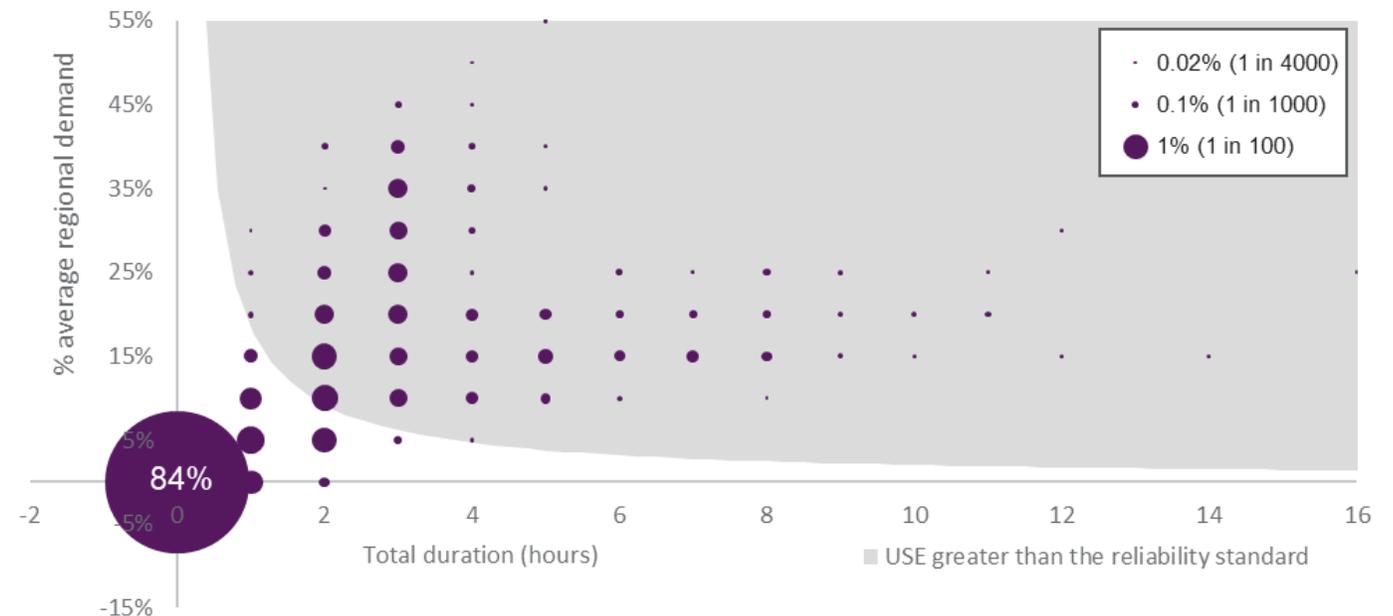
Reliability risks remain with the IRM in **Tasmania** over the ESOO horizon

The IRM is forecast to be exceeded in some NEM regions this summer

Key supply scarcity risks:

- Availability of wind resources
- Generator outages
- **El Niño weather patterns**
- Commissioning of renewable generation, dispatchable capacity and transmission.
- Existing coal and gas generation availability is required in the short-term to ensure reliability as a stopgap measure.

Probability density of forecast USE in South Australia 2023-24, Central scenario

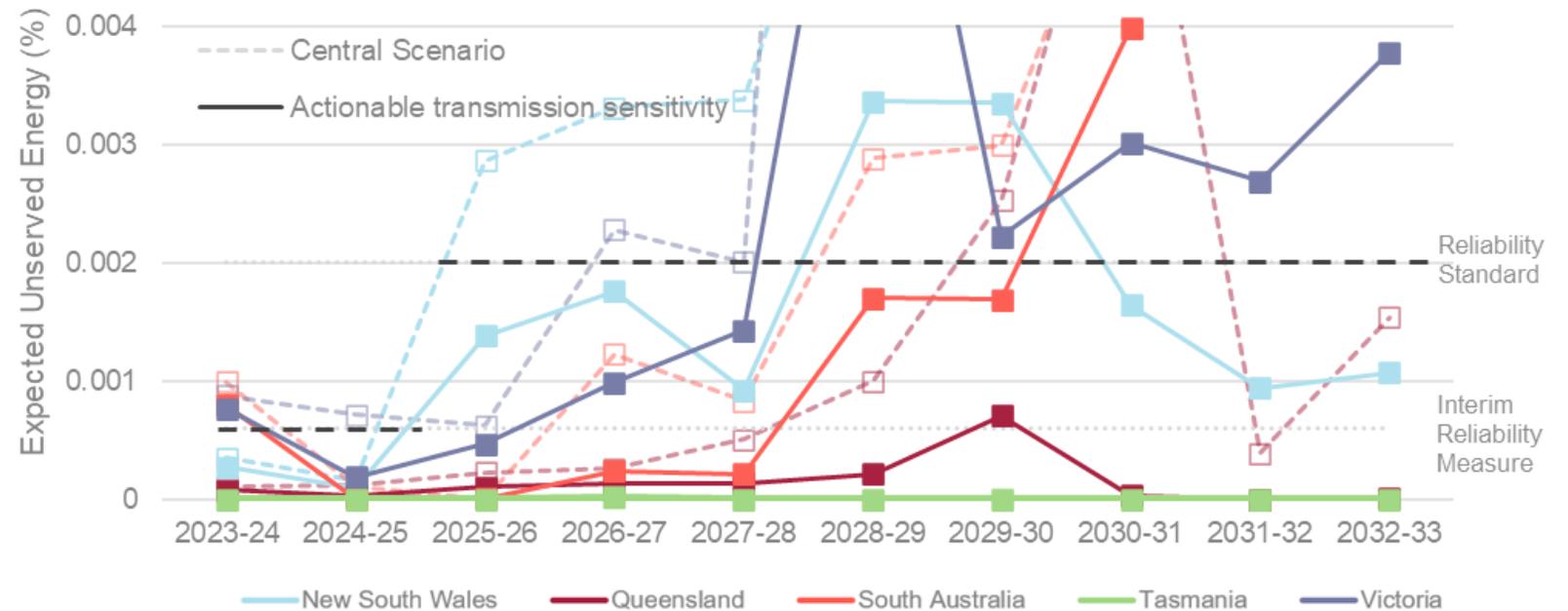


Reliability gaps reduce with CER orchestration, and delivery of actionable transmission projects

Reliability will noticeably improve if:

- All committed and anticipated transmission, generation and storage **developments commission to schedule**
- **Orchestration of consumer energy resources (CER)** is successfully deployed
- **Actionable transmission investments** are delivered to schedule

Expected unserved energy, Sensitivity with Orchestrated CER and actionable transmission infrastructure

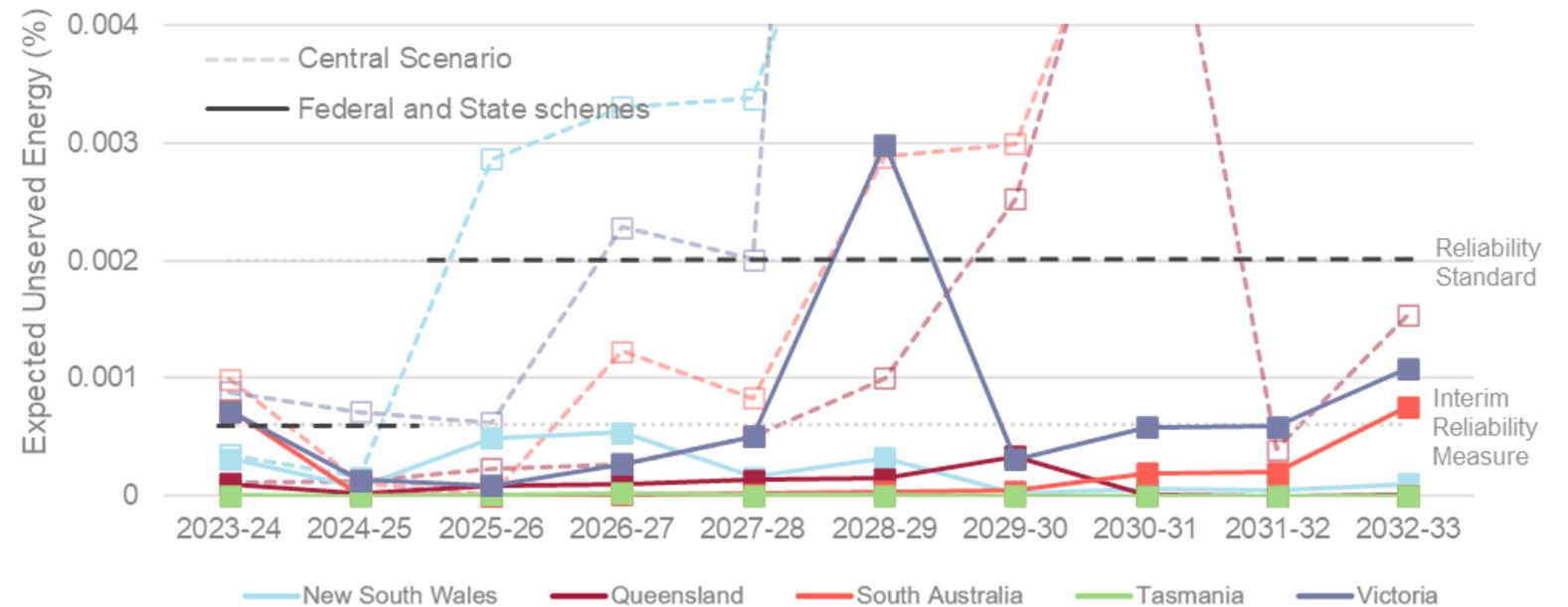


Reliability gaps reduce further if jurisdictional infrastructure developments are delivered to schedule

Reliability will significantly improve if:

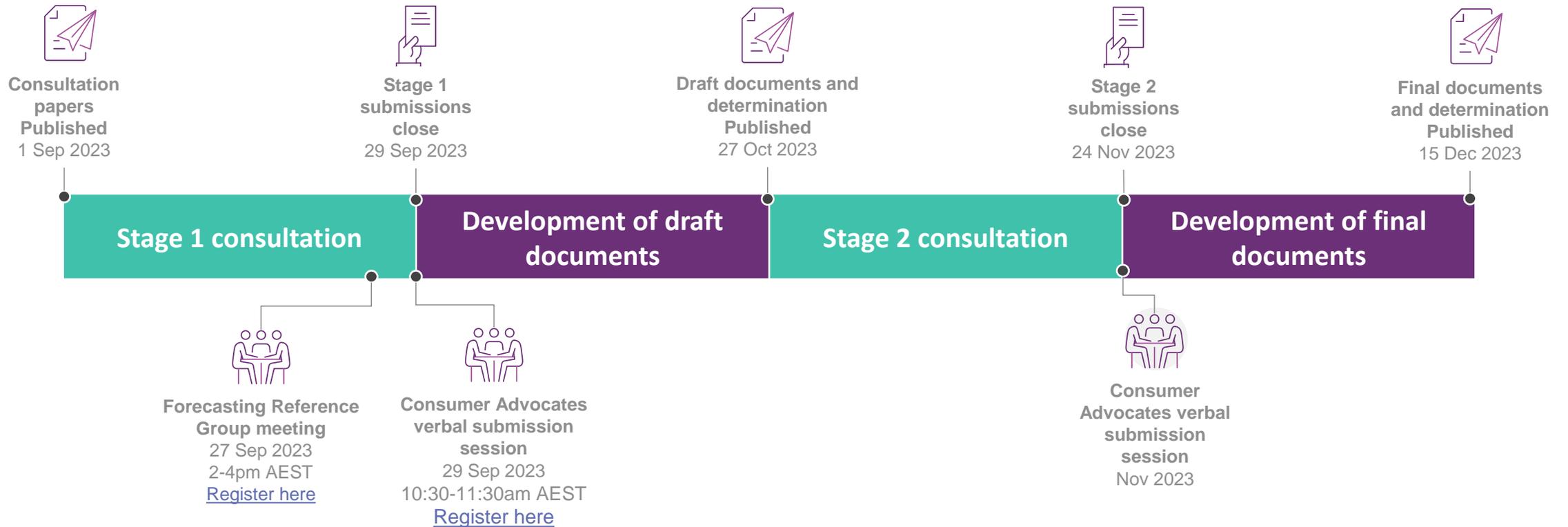
- **Jurisdictional energy infrastructure investments** are delivered as envisioned, and to schedule

Expected unserved energy,
Sensitivity with Orchestrated CER, actionable transmission and other jurisdictionally supported infrastructure



Help AEMO refresh Demand Side Participation (DSP) forecasting

Through the Demand Side Participation (DSP) Forecasting Methodology and DSP Information Guidelines Consultation



Reach out to energy.forecasting@aemo.com.au

NEM Reform Delivery Update

Chris Muffett

Manager, Wholesale Reform Program Delivery



Program Benefit Snapshot

Reform Initiative	Benefits	Implementation Update
Stand Alone Power Systems (<u>SAPS</u>)	Allows electricity services to be delivered through alternatives to a traditional grid connection	SAPS initiative implemented in June 2023
Integrating Energy Storage Systems (<u>IESS</u>)	Allows IESS participants access to additional value streams and promote competition in the contingency Frequency Control Ancillary Services (FCAS) markets	Ability to provide contingency FCAS delivered in March 2023. Aggregated Dispatch Conformance (ADC) is now live
Fast Frequency Response (<u>FFR</u>)	Fosters innovation in faster responding technologies that will help lower costs for consumers	Registration for provision of services opened 9 August 2023. Market to start on 9 October 2023
Increased Medium-Term Projected Assessment of System Adequacy (<u>MT PASA</u>) Information	Allows better management of the NEM generation fleet as aging thermal plants exit and renewable energy enter the market	On target to commence 9 October 2023
Frequency Performance Payments (<u>FPP</u>)	Helps reduce the frequency deviations which would otherwise require the use and purchase of regulation Frequency Control and Ancillary Services (FCAS)	Non-financial operation of the market to commence at the end of 2024 with market commencement in June 2025

An overview of these reform initiatives was shared in Consumer Forums earlier in 2023. You can also find more information on [AEMO's NEM2025 website](#).

Program Update

Overall program status: Amber

Good progress made in the following areas:

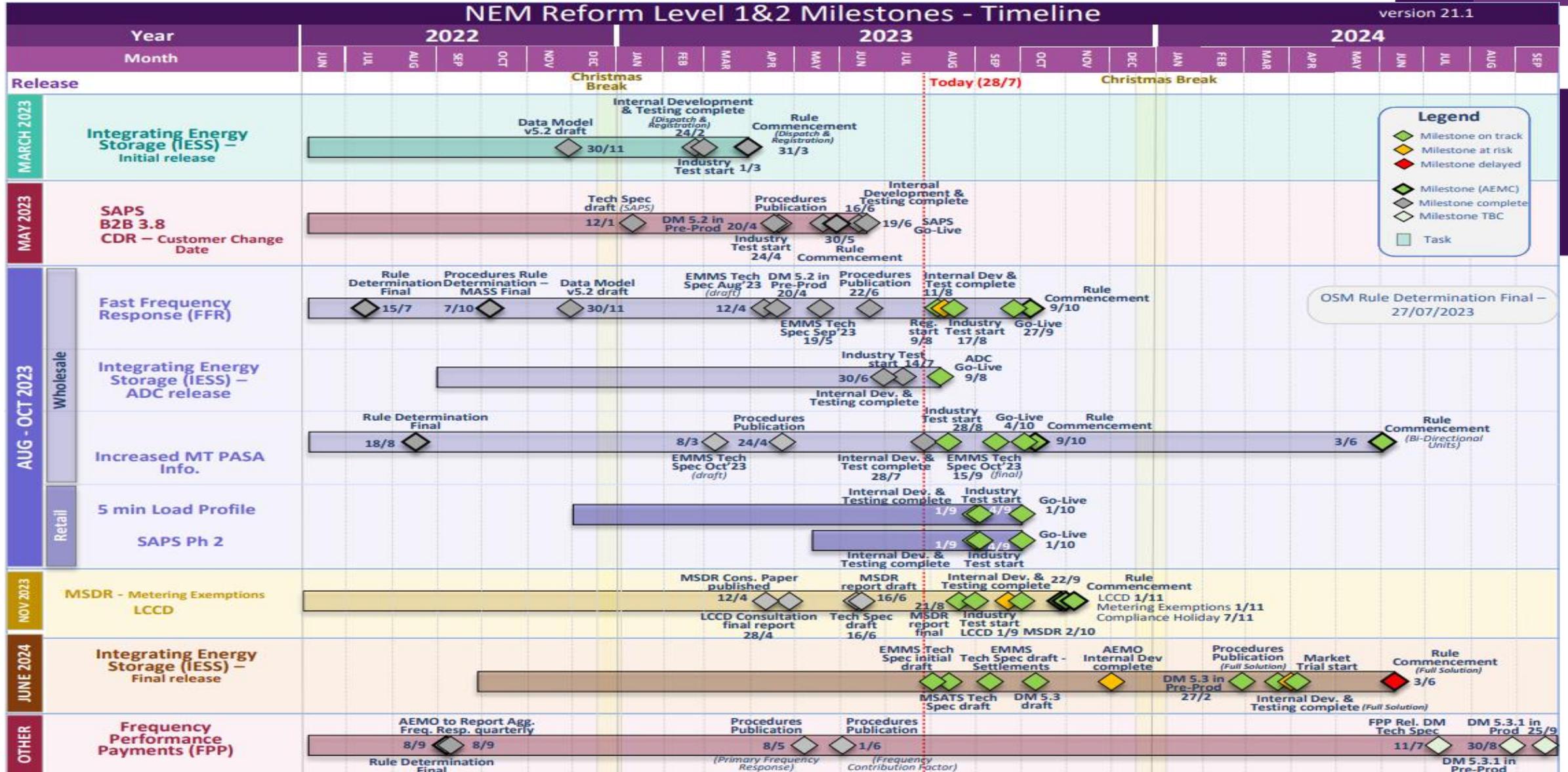
- August 2023 release for Fast Frequency Response and Integrating Energy Storage Systems (IESS) Aggregated Dispatch Conformance (ADC) went live.
- Medium-Term Projected Assessment of System Adequacy (MT PASA) User Acceptance Testing successfully completed with 100% execution.
- Frequency Performance Payments functional and technical workshops now completed.

Key areas of challenge

- Final phase for IESS (June 2024) remains red; re-planning is in process.
- Identity Access Management, Industry Data Exchange, Portal Consolidation (IDAM/IDX/PC) progressing with industry consultation, noting feedback from participants requires adjustment to the program.

Release	Initiatives (ESB Reforms in purple)	Previous Status	Current status	Key Points	Impacted Stakeholders
AUG-23	Integrating Energy Storage Systems [ADC]			Achieved 9 August go-live.	Aggregate Systems
	Fast Frequency Response - Dispatch & Reg			Achieved 9 th August registration commencement and commencement of Industry Testing.	Generators, Market Customers
OCT-23	Fast Frequency Response			Industry test start date remains on track for 17 August. Amber status is due to risks existing in testing schedule compression for Settlements component.	Generators, Market Customers
	5 Minute load profile			Project progressing to schedule.	Market Customers / Financially Responsible Market Participants (FRMPs)
	Increased MT PASA Information			Project progressing to schedule.	Scheduled Generators
NOV-23	Metering Exemptions (MSATS Standing Data Review)			Environment and integration issues impacting schedule. Participant readiness raised in procedures consultation and will be addressed with those participants individually. Impacts for industry readiness raised through ERCF or Implementation Forum.	Retailers, Market Customers and Meter Coordinators/Meter Data Providers (MP/MDPs)
	Consumer Data Right (Last Consumer Change Date)			Project progressing to schedule.	FRMPs
JUN-24	Integrating Energy Storage Systems [Final]			Development delays and resource issues impacting schedule. Schedule and deliverables updated to support participant transition and 2/3 June 24 commencements. Project plan has been developed which achieves the June Go-Live date, some final issues are being resolved before project plan is baselined. Status will be updated once baselined.	Integrated Resource Providers, Network Service Providers, FRMPs, MP/MDPs, Vendors
JUN-25	Frequency Performance Payments			Functional and Technical workshops well progressed. Update on participant feedback to 30 June participant impact and development timeline workshop in this pack.	Generators, Market Customers

External Milestones



NEM Reform Forums update

Channel	Current focus	August meetings
Information Exchange Committee (IEC) and Business-to-Business Working Group (B2BWG)	The current NEM Reform focus is on considering and preparing for the upcoming consultation regarding B2B procedural impacts associated to the introduction of the IESS Rule.	10 August 2023
NEM Reform Electricity Wholesale Consultative Forum (EWCF)	The current focus is on regular updates for inflight reform IESS, FFR, FPP, MT PASA, and the strategic and foundational initiatives (IDAM IDX and PC). The 18 July meeting provided an update on consultations underway, the procedures consultation roadmap and the Dispatch and pricing process improvement	15 August 2023
Electricity Retail Consultative Forum (ERCF)	The current NEM Reform focus is on considering retail and metering procedural impacts associated to the introduction of the IESS Rule.	28 August 2023
NEM Reform Implementation Forum	Focus on 2023 Releases – progress and implementation updates for all inflight initiatives for 2023 and 2024. Includes: ADC Industry Testing, Updates and Assessment of Go-Live Criteria for FFR and Mt PASA, IESS June Market Trial scope and participant transition support	29 August 2023
NEM Reform Industry Testing Working Group (ITWG)	Outlined the approach for August release and October release testing (timelines and scope). LCCD testing Approach, FFR, MT PASA and 5MLP integrated approach during August – October period	31 August 2023
NEM Reform Executive Forum	Agenda to include: Forum purpose and objectives, Program challenge and response, AEMOs Foundational & Strategic Initiatives update, Overall program delivery status and costs.	23 August 2023

For more information and meeting papers for each of the forums, please refer to the [NEM Reform program](#) website.

Upcoming Engagements

August						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

September						
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3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

October						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

November						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

NEM Reform Program Committees/Forums	
NEM Reform Program Consultative Forum	
NEM Reform Delivery Committee	
NEM Reform Delivery Committee - Collab W	
NEM Reform Implementation Forum	
NEM Reform Electricity Wholesale Consultative Forum	
NEM Reform Executive Forum	
NEM Reform Industry Testing Working Group	
NEM Reform Initiative Specific	
Foundational and Strategic Initiatives	
Other Forums	
AEMO Consumer Forum	
Market Systems User Group (MSUG)	
Electricity Retail Consultative Forum	
Other	
Natioanl Public Holiday	
State/Territory Public Holiday	

To learn more about these events, please visit AEMO's [Industry meeting calendar](#) or contact the program at NEMReform@aemo.com.au.

Update on Wholesale Demand Response Mechanism and Five Minute Settlement

Nicole Dodd, Manager, Retail and DER Reform

Chris Muffett, Manager, Wholesale Reform Delivery



Wholesale Demand Response Mechanism

Quick recap

- Demand response (DR) is the voluntary reduction or shift of electricity use by customers.
- Commenced on 24 October 2021, the Wholesale Demand Response Mechanism (WDR) allows for demand side (or consumer) participation in the wholesale electricity market.
- Under this rule, consumers (being commercial and industrial energy users) can sell demand response in the market directly or through specialist third-party aggregators known as a 'Demand Response Service Providers' (DRSPs).
- Customers or DRSPs must bid into the wholesale market through the NEM's standard bidding and scheduling processes, and respond to dispatch instructions from AEMO as market operator.
- They then receive payment for the dispatched response, against a baseline estimate, at the electricity spot price.

WDR operations FY22



Wholesale Demand Response Annual Report

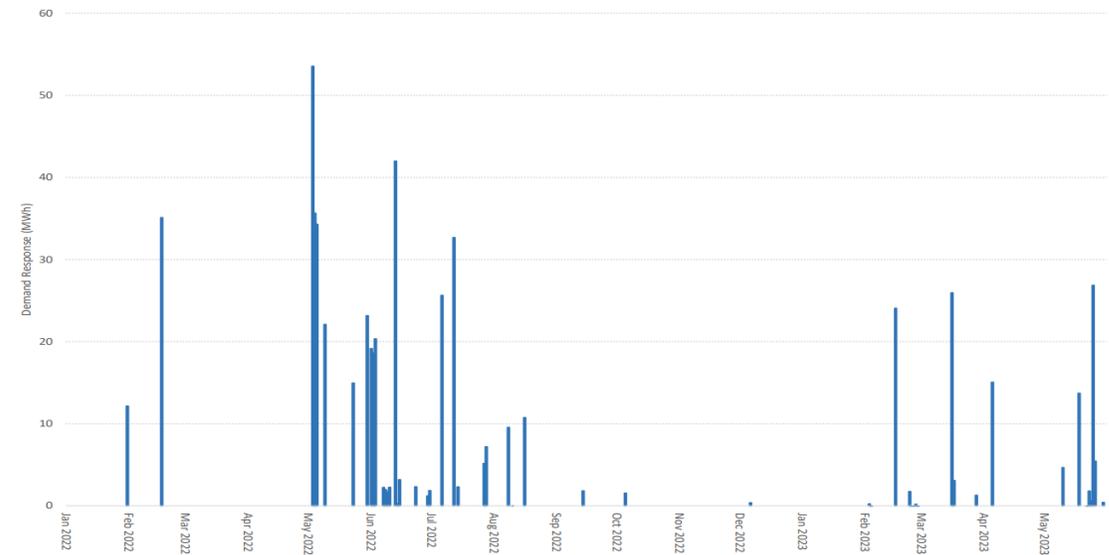
Published June 2023



WDR operation – key statistics (as at 13 June 2023)

Key statistic	Value
Baseline methodologies available	4
Baseline methodologies used by participants	3
Total DRSP registered	1
Total WDRUs registered	13
Total NMIs registered	34
Regions in which NMIs are registered	NSW, VIC, SA, QLD
Total capacity registered (MW)	65.3 MW
Number of NMIs not passing compliance testing – July 2022 to June 2023	4 (Summer 2022-23), 3 (Winter 2023)
WDR event days – July 2022 to June 2023	26 days
Region of WDR events	NSW, QLD, SA, VIC
Total WDR dispatched - July 2022 to June 2023 (MWh)	222 MWh
Average Volume Weighted Price for WDR - July 2022 to June 2023 (\$/MWh)	284 \$/MWh to 2,193 \$/MWh
Non-conformance frequency - July 2022 to June 2023	None
Non-conformance extent - July 2022 to June 2023	9 MW

WDR dispatched over time (MWh)



Integrating demand-side resources into the NEM

- AEMO considers there is a need to value flexibility and integrate demand side resources into the market.
- Currently, the AEMC is consulting on two AEMO-initiated rule changes proposals (below), supporting a moving towards two-sided markets.
- There is also a process by which participants can propose new baseline methodologies which AEMO would assess and consult on.
- AEMO would welcome your feedback and engagement in these processes.

AEMC rule changes open for submissions

Unlocking CER benefits through flexible trading (Flexible trading arrangements)

Submissions close: 14 September 2023

Draft Determination: 12 October 2023

[Link](#)

Unlocking CER benefits Integrating price-responsive resources into the NEM (Scheduled Lite)

Submissions close: 14 September 2023

[Link](#)

Five Minute Settlement (5MS)

Background to Five Minute Settlement (5MS)

- In 2016 Sun Metals proposed a rule change to address the mismatch between dispatch and bidding*, which created market distortions within the NEM.
- In November 2017 the AEMC decided to change the settlement period for the NEM from 30 minutes to 5 minutes, to start 1 July 2021 (delayed to 1 October 2021) to provide a better price signal for investment in fast response technologies, such as gas peaking plant, batteries and demand response.
- The AEMC also extended the approach to cover retail customers, with a transition to 5-minute revenue metering.

*Since the start of the NEM, the scheduled process for generators to dispatch electricity was operated on a 5-minute basis but the settlement process operated on a 30-minute basis. The difference in time period was primarily due to historical arrangements prior to market start, including limitations on metering and data communications.



5 Minute Settlement Factsheet

Published July 2020

Background to Global Settlement (GS)

- In 2018 AEMO proposed a rule change to change the treatment of Unallocated For Energy (UFE) to provide a more equitable allocation among retailers, and enable better transparency and reconciliation of energy usage.
- AEMO proposed that Global Settlement (that is, AEMO's ability to settle the market using the same process for all retailers) be implemented at the same time as Five Minute Settlement (5MS) to deliver project efficiencies for AEMO and the industry.
- In December 2018, the AEMC decided to move to Global Settlement from February 2022 (delayed to May 2022), with a soft start aligning with 5MS commencement:
 - UFE allocated across all retailers, not just the historical 'local retailer'
 - AEMO publishing annual trend reports to improve transparency and drive action to improve UFE

'Unallocated For Energy' (UFE) is the difference between all adjusted metered energy entering a local area compared to all adjusted metered energy consumed within the local area. There are many sources of UFE - for example electrical losses, unmetered loads and estimation errors.



[Global Settlement Factsheet](#)

Published July 2020

[Unaccounted For Energy Factsheet](#)

Published June 2022

Implementation approach

- In February 2019 AEMO initiated a discussion with industry on 5MS/GS implementation approach.
- Several technology options were considered, including delivering on existing platforms, uplifting platforms, or utilising off-the-shelf products and/or services.
- AEMO determined that the most appropriate option was to uplift platforms, and outlined the estimated cost to:
 - engage a vendor to assist with the development of a new metering system for Meter Data Management and Profiling and Energy Allocation (PAE)
 - rewrite the settlement system on a modern supportable technology platform
 - retain existing dispatch systems, but enhance bid/offer participant interfaces.
- Total cost of ownership (over 10 years) expected to be \$121 million to deliver and operate systems to support 5MS/GS and technology uplift.

5MS & GS program scope

Retail and metering	Dispatch and bidding	Settlements
Function		
<p>Manages receipt & storage of market data (metering & standing data). Metering prepares data for market settlement & enables market reporting.</p>	<p>Manages demand forecasting & the dispatch price every 5 mins (and aggregates spot price every 30 mins).</p>	<p>Manages the calculation of financial liabilities & credits between market participants daily. Settles all trade in the NEM on a weekly basis.</p>
Changes for 5MS/GS compliance		
<ul style="list-style-type: none"> • Enable receipt of 5 minute interval metering data. • Enable management of >2 trillion data points by 2028. • Change profiling algorithms to derive 5 min energy data. • Enable energy allocation at 5, 15 and 30 min intervals. • Participant and connection point changes for Global Settlements and UFE calculation 	<ul style="list-style-type: none"> • Increase daily bidding intervals from 48 to 288. • New data structures required to receive, use and store 5-minute bids and offers. • Changes required to calculate the floor price and price cap. • AEMO to publish 5-minute data. 	<ul style="list-style-type: none"> • Enable settlement on 5 min granularity, 5 min price & Marginal Loss Factors (MLF). • Settlements estimations will calculate energy transactions per 5 min period. • Additional calculations (i.e. market ancillary services, FCAS), to be calculated with 5 min data. • Calculate UFE values and apply according to Global Settlement rules from 1 May 22
Technical uplift/legacy upgrade		
<ul style="list-style-type: none"> • Replace existing 20-year old solution with new solution using cloud-native strategic technologies • Re-architect to “big data” database solution • Establish robust security patterns • Establish new participant APIs for more flexible participant interactions • Extend implementation of integration layer to support hybrid on-prem/cloud solution. 	<ul style="list-style-type: none"> • Bidding Service replaced with new 5-minute bidding service - Web Bidding Screens, New Bidding Service, and establish new participant APIs for more flexible participant interactions. • Uplift of 5-min pre-dispatch to incorporate fast start inflexibility and regional price sensitivities. • Legacy systems remain current, no explicit technical uplift. 	<ul style="list-style-type: none"> • Technical uplift of existing solution in line with strategic database and programming language technology. • Re-architect solution for improved resilience and performance. • New API channels for participant interfaces.

AEMO anticipated and actual costs

	Original cost estimate (Sept 2017)	Revised cost estimate (Feb 2019)	Final costs
Scope	Five Minute Settlement only	<ul style="list-style-type: none"> •Five Minute Settlement •Global Settlements •Technology uplift 	<ul style="list-style-type: none"> •Five Minute Settlement •Global Settlements •Technology uplift
Total	<ul style="list-style-type: none"> •10-year cost: \$85 million (assuming high meter volumes), including: \$10-15 million upfront cost •\$2 - \$7 million per annum (depending on meter volumes) 	10-year cost: \$121 million (based on projected meter volumes), including: <ul style="list-style-type: none"> •\$80 million upfront •\$4.5 million per annum 	Separate budget revenue requirement in annual fees process: <ul style="list-style-type: none"> •FY22 budget: \$25 million •FY23 budget: \$43 million •FY24 budget: \$42 million Annual requirement composed of amortisation/depreciation of capex (approx. \$117 million), labour, cloud and financing costs, over/under recovery from previous periods
Challenges	<ul style="list-style-type: none"> •Low upfront cost as it was based on a meter data subscription service model that was later found to not be viable (no suitable service available, and no other markets have implemented 5MS at the same scale) •Did not include the costs of technology uplift and Global Settlement. 	<ul style="list-style-type: none"> •Underestimated cloud computing costs •Higher delivery costs associated with reform delays •COVID-19 challenges. • 	<ul style="list-style-type: none"> •Underestimated the complexity and challenges of implementing and integrating the new technology •Underestimated cloud computing costs •Three month delay • •

Cost challenges

Cloud costs

- Cost estimates underestimated the complexity of the work and the cost drivers, resulting in significant increase in operational costs that were not initially anticipated.
- First time partnering with Microsoft and TCS as key vendors for the metering workstream and working with offshore team.
- First time using the cloud, rather than on-premises; AEMO needed to mature its estimation and practices in this space.
- Tied to Microsoft public cloud due to digital solution. Moving to a cheaper storage solution would require re-engineering of the solution.
- Ever-growing volume of data means ongoing storage cost increases.
- All possible remediation of existing cloud solution has occurred to minimise costs.

Industry costs

- AEMO did not assess the overall industry cost of implementing 5MS/GS during the project.
- Understood that some participants also elected to uplift technology as part of implementing the reform.
- AEMC did consider the cost of implementing the reform, with some estimates being the total cost over 15 years would exceed \$250 million (AEMC final determination, p. 125).

Reform outcomes

Reform/change	Five Minute Settlement	Global Settlement	Technology uplift
Direct benefits	<p>Market distortion (5/30 issue) and disorderly bidding (first/last interval) no longer apparent.</p> <p>Clear incentives for fast responding technologies (e.g. AGL decision to invest in Barker Inlet).</p>	<p>More equitable allocation of UFE between retailers.</p> <ul style="list-style-type: none"> •Greater transparency of UFE trends for each distribution area. 	<p>Less technology debt within wholesale market systems, leading to lower support and development costs going forward.</p> <p>Able to absorb and scale significant metering volumes.</p>
Indirect benefits		<p>Local retailers are better able to forecast energy portfolio (less impact from UFE).</p>	<p>Use of Application Programming Interfaces (API) expected to reduce industry development costs, particularly when legacy platforms are decommissioned.</p>
Other impacts	<p>Disruption to trading of Cap instruments (delays in establishment of a 5-minute Cap).</p>	<p>Anecdotal reports that some retailers are passing through UFE at spot prices (passing risk to the consumer), however this will potentially lead to retailer differentiation.</p>	<p>Higher cloud costs are a focus of attention.</p>
Further information	<p>AEMO will continue to monitor through Quarterly Energy Dynamics (QED) report.</p>	<p>AEMO will publish annual UFE trends report.</p>	<p>AEMO continues to consider its technology suite to simplify and reduce ongoing costs.</p>

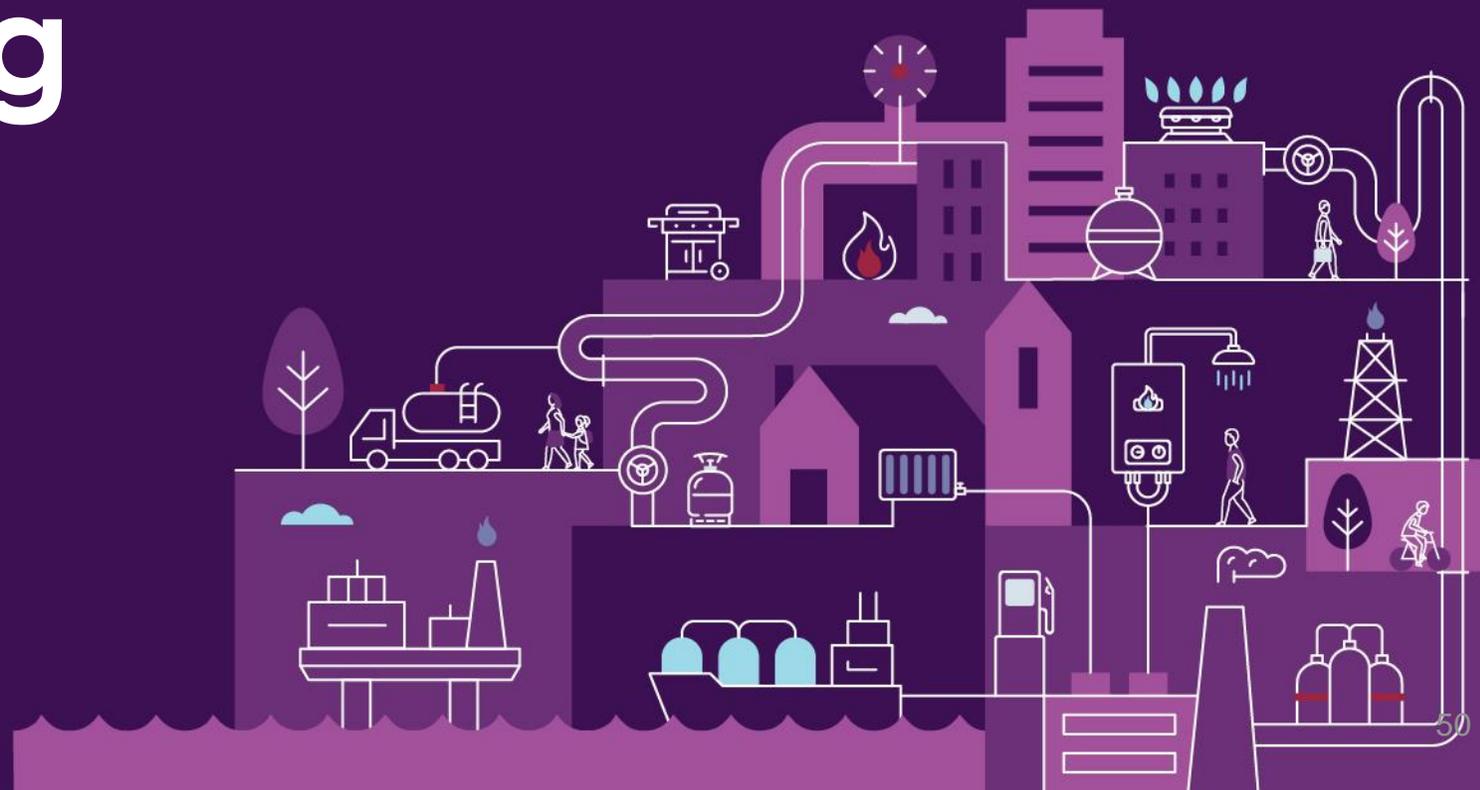
PWC lessons learned review

- AEMO engaged PWC to conduct a post implementation ‘lessons learned’ review, focused on understanding effectiveness of the implementation program and opportunities for future change implementation programs.
- The scope included interviews and surveys with (34) industry participants involved in earlier implementation forums, and looked at program governance, industry engagement, communications and reporting, and risk, change and issue management.
- Consumer representatives were not part of the forums or review, as feedback suggested appetite was low and a preference to be kept informed through the Consumer Forum and six-monthly information briefings.

What are we doing differently since 5MS?

Focus	Actions
Enhanced Program governance	<ul style="list-style-type: none"> NEM Reform Program has a high level of governance and accountability and the forward plan is captured in the NEM Reform Implementation Roadmap to provide a holistic view of the reforms. The Reform Delivery Committee (RDC) oversees delivery and minimises implementation costs.
Enhanced cost transparency	<ul style="list-style-type: none"> AEMO has been transparent about the costs of the reform program and options to implement it (NEM Reform Program Business Case). AEMO is actively working to improve its financial accountability and transparency, through a range of mechanisms, including through the Financial Consultative Committee.
Digital strategy and capability uplift	<ul style="list-style-type: none"> For all future digital systems, we conduct an analysis of solution performance and price, to ensure the solution is practical, technically and commercially. AEMO has employed a cloud architect to optimise our cloud environment. More broadly, digital optimisation and simplification is occurring

Next meeting



Potential agenda items

November

- NEM Reform update
- ISP update

December

- Summer readiness
- Publication of the draft 2024 ISP (15th December)

Survey for feedback

<https://forms.office.com/r/fKZ06zepb4>

Thank you



References and Resources

Rule changes

- Five Minute Settlement:
<https://www.aemc.gov.au/rule-changes/five-minute-settlement>
- Global settlement and market reconciliation:
<https://www.aemc.gov.au/rule-changes/global-settlement-and-market-reconciliation>
- Delayed implementation of five minute and global settlement:
<https://www.aemc.gov.au/rule-changes/delayed-implementation-five-minute-and-global-settlement>

AEMO initiatives

- Five Minute Settlements:

<https://aemo.com.au/initiatives/major-programs/nem-five-minute-settlement--program-and-global-settlement/five-minute-settlements>

- Global Settlement:

<https://aemo.com.au/initiatives/major-programs/nem-five-minute-settlement--program-and-global-settlement/global-settlement>

- Five Minute Settlement Archive:

<https://aemo.com.au/initiatives/major-programs/past-major-programs/five-minute-settlement>

Other AEMO information

- Reform Delivery Committee:
 - <https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/reform-delivery-committee>
- Financial Consultation Committee:
 - <https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/financial-consultation-committee>