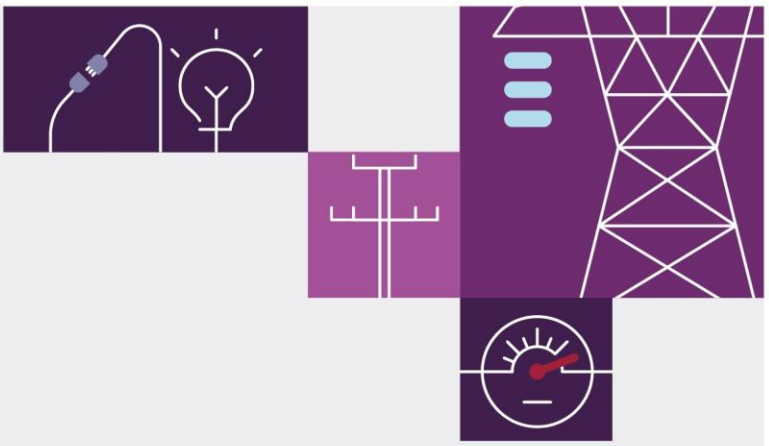
AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

NEM Reform Program Initiative Briefs

October 2024

A reference document for initiatives captured in the NEM Reform Implementation Roadmap Version 5



Important notice

Purpose

The purpose of this publication is to provide further information on initiatives captured in version 5 of the NEM Reform Implementation Roadmap, including key AEMO strategic or foundational initiatives, to help inform stakeholders understanding of the scope, assumptions and relationships underpinning each of the initiatives.

Disclaimer

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Version control

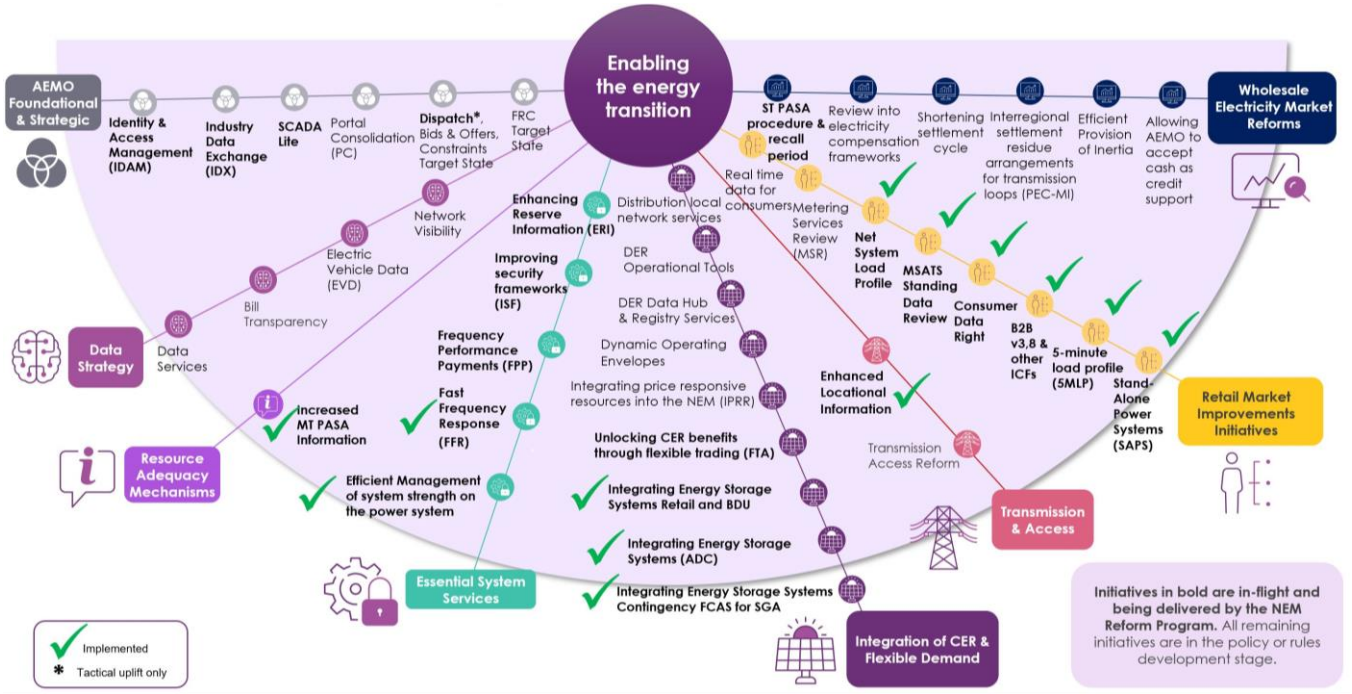
Version	Release date	Changes
1	27/04/2022	Initial publication
1.1	28/04/2022	Update to initiative briefs in line with NEM Reform Implementation Roadmap
2	31/08/2022	Update to initiative briefs to update initiative scope, including removal of four initiatives (Operational Decision-Making Tools, Operational Data Store, Business Rules Engine and Forecasting Platform Uplift) and addition of two initiatives (Capacity Mechanism and Congestion Management Mechanism).
3	27/04/2023	Update to initiative briefs to reflect current scope and timing. Removal of Turn-up Services brief following de-scoping from the NEM Reform Program.
4	05/10/2023	Update to initiative briefs to reflect current scope and timing including the following initiatives 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 7.3, 8.1, 8.4.
5	15/12/2023	Update to initiative briefs to reflect current timing including the following initiatives 2.2, 3.3,3.4, 5.2,5.3.
6	30/04/2024	Restructure and/or update of all information briefs to reflect current scope and timing.
7	31/10/2024	Restructure and/or update of all information briefs to reflect current scope and timing. Inclusion of additional Wholesale and Retail electricity reform initiatives not originally captured at the time of the Program's establishment.

NEM Reform Program

The NEM Reform Program (the Program) was established by AEMO in 2022 to collaborate with energy industry participants on the implementation of reform initiatives across Australia's east coast electricity and gas markets, as well as the delivery of key foundational and strategic initiatives that uplift AEMO's base capability on which reforms are dependent.[1] Initially centred around the ESB's post-2025 electricity market design, the breadth of reforms aim to address essential change in a world of expanding consumer choices, new technologies, large-scale capital replacement, as well as key actions to support a more secure, resilient and flexible gas market.

The Program is a large-scale, complex, industry-wide program, impacting participants across all areas of the NEM. Each initiative that makes up the Program's scope supports the transition of the NEM and brings Australia closer to a net-zero future. To manage the implementation of this significant package of reforms and to deliver the best possible outcomes for consumers, the Program works collaboratively with industry participants from across the energy sector. The Program focuses on delivering solutions that meet the reform objectives as efficiently as possible, leveraging opportunities to bundle, sequence and prioritise initiatives within the Program, and where possible identify and drive out costs through solution design and implementation.

Figure 1. NEM Reform Program Scope



NEM Reform Implementation Roadmap

AEMO, in partnership with the Reform Delivery Committee (RDC, or the Committee), has compiled and maintains the NEM Reform Implementation Roadmap (the Roadmap) which details an integrated timeline for implementing

[1] AEMO NEM Reform Program. Website: https://aemo.com.au/initiatives/major-programs/nem-reform-program

the reform initiatives that comprise the ESB's Post-2025 recommendations, as well as broader NEM and east coast gas related reform initiatives that collectively make up the Program. [2,3]

The purpose of the Roadmap is to provide AEMO and stakeholders with a holistic view of the reform program impacting national electricity and gas markets across the east coast of Australia. It does so by bringing together AEMO's former Regulatory Implementation Roadmap, NEM2025 Implementation Roadmap and East Coast Gas Reform Implementation Roadmap into one central Roadmap.

Initiative Briefs

This reference document provides a brief description of each of the ESB's post-2025 reform initiatives, broader inflight[4] electricity reform initiatives, as well as AEMO's own foundational or strategic enabling initiatives[5] that are captured within the Program to help stakeholders understand the scope, assumptions and relationships (refer to appendix) underpinning the Roadmap.

Each initiative brief aims to provide an understanding of the problem statement a reform is seeking to address, the proposed solution and its key benefits, including the known or indicative scope changes proposed. In addition to this, each initiative brief provides a high-level assessment of impacts to market and industry stakeholders and AEMO teams, next steps in the reforms development and where stakeholders may access further information.

In setting out the changes to be implemented or proposed AEMO have sought to provide stakeholders with an understanding of the Procedures & Guidelines, Market Application and Market Interface changes required as per the table below.

Procedures & Guidelines	Market Applications	Market Interfaces
• Example	• Example	• Example

In setting out the indicative impacts to market and industry stakeholders and AEMO teams, a rating has been applied of low, medium, or high based on RDC and participant feedback, as well as AEMO's own assessment of the change impacts as shown below. For those initiatives with impacts across multiple AEMO teams, AEMO has referenced the highest rating impact. Where the impacts are not known, AEMO has called out those participants likely to be impacted based on current designs or assumptions underpinning each initiative.

Low Impact Medium Impact High Impact

The details of each initiative are subject to change arising from further policy work or further analysis. As such, each initiative brief is to be revised periodically to reflect changes in scope or timelines as policy or designs are finalised or as new rule determinations are made.

[2] AEMO NEM Reform Implementation Roadmap. Available here: https://aemo.com.au/en/initiatives/major-programs/nem-reform-implementation-roadmap.

[3] The NEM2025 Implementation Roadmap has been integrated with the Regulatory Implementation Roadmap and East Coast Gas Reform Implementation Roadmap to form the NEM Reform Implementation Roadmap.

[4] Initiatives which have reached a final rules determination or final policy outcome and are now mandated for implementation.

[5] Foundational initiatives represent an investment in an AEMO legacy system to deliver an uplift to base capability on which reforms are dependent. Strategic initiatives represent an investment where system uplift is required at some time in the future and AEMO sees the opportunity for this life-cycle type investment to be brought forward and delivered in the same timeframes as the reforms for efficiency purposes.

Updates made as of October 2024

All initiative briefs have been updated for changes in scope and/or timing to reflect the latest publicly available information. The following table highlights the initiatives briefs removed or included in alignment with version 5 of the NEM Reform Implementation Roadmap.

Initiative	Changes to this report
Increased MT PASA	Removed – initiative implemented 9 October 2023
Capacity Investment Scheme	Removed – delivered outside NEM Reform Program
Fast Frequency Response	Removed – initiative implemented 9 October 2023
Integrating Energy Storage Systems	Removed – initiative implemented (final releases) 2 and 3 June 2024
Enhanced Locational Information	Removed – initiative implemented 7 June 2024
ST PASA procedure and recall period	Included – delivered through NEM Reform Program
Metering Services Review (Accelerating Smart Meter Deployment)	Included – Open rule change, to delivered via NEM Reform Program subject to final AEMC determination
Interregional settlement residue arrangements for transmission loops	Included – Open rule change, to delivered via NEM Reform Program subject to final AEMC determination
Shortening the settlement cycle	Included – Open rule change, to delivered via NEM Reform Program subject to final AEMC determination

Contents

Essential System Services

Frequency Performance Payments

Enhancing Reserve Information

Improving security frameworks for the energy transition

Frequency Performance Payments

Establishing new financial incentives for facilities such as electricity generators, large loads, and batteries to have a helpful impact on system frequency.

Problem to be solved

Essential System Services

Key Dates

- Final Determination - 8 SEP 2022
- Non-Financial Operation (NFO) Go-live - 9 DEC 2024
- Financial Go-live - 8 JUN 2025

Frequency can be thought of as the 'speed' at which a power system operates. System frequency varies whenever the electricity supply does not exactly match consumer demand. Stable frequency is a fundamental requirement to maintain the secure operation of power system. The changing NEM generation mix and increasing number of inverter-based resources such as large-scale wind and solar farms, as well as the high uptake of rooftop PVs, make maintaining the supply-demand balance more challenging. Consequently, keeping the frequency within a limited range around its nominal value has become more difficult. This means new measures are required to support the operation of the power system in accordance with the standards stipulated in the Frequency Operating Standard (FOS).

Solution

In September 2022, the AEMC made a final rule determination[6] that:

- Confirmed the mandatory Primary Frequency Response (PFR) arrangements were to be extended for all scheduled and semi-scheduled generators and scheduled loads (removing an existing June 2023 sunset to such arrangements).
- Introduced the new Frequency Performance Payments (FPP) process, which creates a double-sided system of incentive payments and penalties based on units' impact on system frequency.
- Established new reporting obligations for AEMO and AER in relation to the levels of aggregate frequency responsiveness in the power system and the costs of frequency performance payments.

This initiative focuses on the second of these changes and the establishment of a new FPP system and associated procedures and guidelines (including Frequency Contribution Factor Procedures) that provide incentives for all facilities to operate in a way that helps maintain power system frequency within the normal operating band, at the lowest cost to consumers.

Key benefits

- Improved valuation and pricing of plant behaviour, providing clear economic signals to participants about the value of good frequency performance (and the cost of poor performance).

[6] AEMC National Electricity Amendment (Primary Frequency Response Incentive Arrangements) Rule 2022. 8 September 2022. Available here: https://www.aemc.gov.au/rule-changes/primary-frequency-response-incentive-arrangements

- Improved transparency and provision of relevant information faster to market participants and stakeholders to assess the effectiveness and efficiency of the frequency control frameworks over time.
- More granular allocation of Regulation Frequency Control Ancillary Services (FCAS) recovery, with the new five-minute Contribution Factors (CF) to replace the current 28-day Causer Pays factors.

Changes to be delivered

The changes can be broken down into two high level deliverables which addresses two types of responses that units can provide to help control frequency during normal operations:

1. A new double-sided frequency performance payments process is introduced. In each 5 min trading interval, each cost recovery market participant receives a credit or debit, based on the helpfulness of their impact on system frequency.
2. A new process for allocation of regulation FCAS costs is introduced. New 5-min contribution factors replace current 'Causer Pays' arrangements, which means that the cost of regulation FCAS will be recovered from units that have an unhelpful impact on system frequency.

Procedures & Guidelines	Market Applications	Market Interfaces

• Development and consultation on Frequency Contribution Factors procedure to replace the existing Regulation FCAS Contribution Factor (Causer Pays) procedure.
• Consultation on amendments to AEMO's PFR Requirements procedure
• Consultation and amendment of AEMO's Energy Market Management System (EMMS) Data Model Technical Specifications – FPP Report and Settlements Reports.
	• Design, build and implement a new FPP system, to determine contribution factors and other parameters.
	• Modifications to existing NEM Settlements system to apply contribution factors
		• EMMS Data Model FPP reports and tables including, but not limited to:
		  • Report 1 – FPP unit curated 4 second SCADA data
		  • Report 2 – FPP regional frequency and frequency measure (4 second)
		  • Report 3 – FPP unit performance (5 minute)
		  • Report 4 – FPP unit contribution factor (CF)
		  AEMO intends to provide participants with an additional 15 FPP reports regarding FPP measurement and calculations
		• Updates to EMMS Settlement table / reports including, but not limited to:
		  • Settlement report (SR) – TXT
		  • SET_ANCILLARY_SUMMARY
		  • SET_FCAS_PAYMENT
		  • SET_FCAS_RECOVERY
		• Changes to NEMWEB Settlement Reports and Ancillary Services Reports
		• Update to AEMO Website AS Payment / Recovery files

Further details on the changes proposed are available via the FPP page of AEMO's website here.

AEMO has identified the need for a rule change regarding FPP settlements as a result of the Integrating Energy Storage Systems (IESS) rule change, which went live on 3 June 2024. Allocation of penalties / incentives to the residual should be based on adjusted consumed energy and adjusted sent out energy (post-IESS construct) rather than adjusted gross energy (used before IESS to allocate non-energy costs). AEMO has submitted a rule change request to the AEMC to amend the basis of FPP allocations. Consultation on the rule change, including on

whether the change is 'non-controversial', is yet to commence as of October 2024. This rule change is expected to be implemented prior to financial Go-live 8 June 2025.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

- Generators (Scheduled & Semi-Scheduled)
- Integrated Resource Providers
- Market Customers (Scheduled Load)

AEMO Teams

- Operations (Systems Capability, Operational Support, Market Operations)
- Digital (Enterprise Application Services (Wholesale Solutions), Data Management, Customer, Engagement & Services,)

Next steps

- AEMO's rule change request lodged October 2024.
- Pre-production release and industry test start for NFO – 25 October 2024.
- Data model available in pre-production – 30 October 2024.
- Industry Go-live plan published – 18 November 2024.
- Production release and NFO commences – 9 December 2024.
- A six-month period of NFO of the new FPP arrangements, will commence from December 2024 to May 2025, ahead of Financial Go-live in June 2025.

Where can I find more information?

AEMC Rule Change – Primary frequency response incentive arrangements: https://www.aemc.gov.au/rule-changes/primary-frequency-response-incentive-arrangements

AEMO NEM Reform Program – Frequency Performance Payments: https://aemo.com.au/initiatives/major-programs/frequency-performance-payments-project

AEMO – Frequency Contribution Factors Procedure: https://aemo.com.au/consultations/current-and-closed-consultations/frequency-contribution-factors-procedure

AEMO – Primary Frequency Response Requirements: https://aemo.com.au/consultations/current-and-closed-consultations/primary-frequency-response-requirements

Enhancing Reserve Information

Providing clearer information about available generation reserves in the NEM.

Problem to be solved

There is growing forecast uncertainty and variability in net demand over operational timeframes, contributed to by growing variable renewable energy (VRE) penetrations, weather, participant availability, commitment decisions, storage depth, and coordination of distributed energy resources.[7] At the same time, the nature of reserves is evolving, with greater reliance on energy-limited plant.

Essential System Services

Key Dates

- Final Determination - 21 MAR 2024
- AEMO High Level Implementation Design - 12 JUL 2024
- Go-live - 1 JUL 2025 (go-live of near-real time state of charge information for Tasmania by 1 July 2027)

Solution

The AEMC's final rule determination[8], published 21 March 2024, sets out to increase transparency of energy availability in an operational timeframe through publication of the following:

- State of charge: the energy availability of batteries (i.e., state of charge in MWh) will be published close to real-time, aggregated by region, and the following trading day by dispatchable unit identifier (DUID) to align with existing post-trading day publications.
- Daily energy constraints: the combined energy constraints of other energy-constrained plant (hydro, gas and coal) would be aggregated by region and published daily (at the start of each trading day).
- Maximum storage capacity: storage participants would need to provide their maximum storage capacity (MWh) to AEMO in their bid and offer validation data.

These incremental improvements are to support the current market frameworks and provide for the opportunity to observe the future generation fleet's response to changes in market signals. The commencement of the new provisions is as follows:

- 1 July 2025: Publishing state of charge information for batteries, at the DUID level, for each trading interval in respect of the previous trading day.
- 1 July 2025: Publishing daily energy limits (total availability) for scheduled generators aggregated by region, at the start of each trading day
- 1 July 2025: Scheduled bi-directional units (BDUs) to provide maximum storage capacity as part of their bid validation data
- 1 July 2027: Publishing aggregated state of charge information for batteries close to real time as practicable, but at least once in each trading internal (TI). AEMO intends to voluntarily commence publishing this

[7] AEMO Engineering Framework 2022, AEMO Integrated System Plan 2022, AEMO Renewable Integration Study 2020.

[8] AEMC National Electricity Amendment (Enhancing reserve information final determination) Rule 2024. 21 March 2024. Available here: https://www.aemc.gov.au/sites/default/files/2024-03/Enhancing%20reserve%20information%20final%20determination.pdf

information from 1 July 2025 in regions with at least three independent operators of such facilities. Currently, all NEM regions except Tasmania meet this threshold.

Key benefits

The provision of additional information on energy availability could better ensure the availability of reserves across all timeframes and allow more efficient decisions about the commitment of reserves at certain times, for example, supporting participants better manage their reserve availability to address shorter-duration flexibility issues.

Changes to be delivered

The AEMC's final rule requires AEMO to publish information on energy availability in the operational timeframe, including state of charge and daily energy constraints, and for participants to provide maximum storage capacity to AEMO. This information is already provided to AEMO by market participants, either through the SCADA system, daily bids through PASA or as part of the new arrangements to integrate energy storage systems (IESS).

Procedures & Guidelines	Market Applications	Market Interfaces
• Registration Guide and Application Form • New element, Maximum Storage Capacity will be added to Schedule 3.1 Bid Validation Data guideline • Amendment to the Pre-dispatch Region Solution table in SCADA	• Changes to EMMS Participant Data Model - to publish aggregated energy availability data (for units other than batteries) the field DEC_Residual_Energy is added to tables • Changes to NEM Reports - state of charge data added to NextDay.UnitSolution table; new report to the Next Day reporting event to publish aggregated energy availability data (for units other than batteries); amendment to the conditions currently placed on concealing real-time state of charge data • Amendment to the Participant Registration tables in MMS Data Model	Reporting of: • Maximum storage capacity - PARTICIPANT_REGISTRATION tables in MMS Data Model (similar approach to the publication of existing bid validation data). • Daily energy constraints - new column in the existing Pre-dispatch Region Solution table in SCADA. • State of charge the next day - publish by DUID the following trading day (to align with existing post-trading day publications). • State of charge real time – publish actual state of charge after each Dispatch run via the participant data model DISPATCHREGIONSUM table in SCADA (this information already currently provided by participants through SCADA).

Further details on the changes proposed are available via the ERI page of AEMO's website here.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

- Generators (Scheduled)
- Integrated Resource Providers

AEMO Teams

- Operations (Operational Support (Electricity Market Modelling, Operations Planning))
- Digital (Enterprise Application Services (Wholesale Solutions)

Next steps

- Initial EMMS data model tech spec and initial EMMS tech spec to be published on 31 October and 1 November 2024 respectively.

- Industry test strategy published in January 2025 with testing from May to June 2025.
- Go-live 1 July 2025 and near real-time state of charge information for Tasmania go-live by 1 July 2027.

Where can I find more information?

AEMC Enhancing Reserve Information: https://www.aemc.gov.au/rule-changes/enhancing-reserve-information-formerly-operating-reserves

AEMO NEM Reform Program – Enhancing Reserve Information: https://aemo.com.au/en/initiatives/major-programs/nem-reform-program/enhancing-reserve-information-project

Improving security frameworks for the energy transition

Improve existing security frameworks to deliver essential system services, through the energy transition.

Problem to be solved

Essential system services (ESS)[9] are critical to maintaining overall power system security and reliability by meeting core power system requirements. While historically synchronous generators (such as large coal, gas and hydro generators) supplied ESS simply as a by-product of energy, new non-synchronous generators (such as solar PV, wind and batteries) do not automatically provide these services.

Consequently, under the current market design, which does not explicitly value all ESS, the changing generation mix is providing fewer of these services. Further engineering understanding is required to determine the appropriate mix, definition and quantification of the services. There is also a need to co-ordinate the resources providing these security services, accounting for all services that they may provide.

Essential System Services

Key Dates

- Final Determination - 28 MAR 2024
- AEMO High Level Implementation Assessment V0.1 - 31 MAY 2024
- Transitional Services Framework commences - 3 JUN 2024
- Improved Directions Transparency implemented - 4 JUL 2024
- Full Enablement Obligations Go-live - 2 DEC 2025

As a result, AEMO is increasingly making operational decisions, such as directing generators to be online to support a secure power system. Directions were designed as a last resort — reliance on them increases costs to consumers, and also places increased risk on system security.

Solution

The AEMC's final rule determination published 28 March 2024 sets out various changes to improve existing security frameworks, including:

- aligning the existing inertia and system strength frameworks (introducing a NEM-wide inertia floor, aligning procurement timeframes with the system strength framework, and removing restrictions on the procurement of synthetic inertia);
- removing the exclusion to procuring inertia network services and system strength in the Network Support and Control Ancillary Services (NSCAS) framework;
- adjusts TNSP cost recovery procedures for non-network security options to support contracting arrangements and minimise volatility for electricity consumers;

[9] These are services that help keep the technical parameters of the electricity system within acceptable limits so that it can securely deliver electricity to consumers. These include a suite of services such as inertia, system strength and frequency.

- creating a new transitional non-market ancillary services (NMAS) framework for AEMO to procure security services necessary for the energy transition;
- requiring AEMO to enable (or 'schedule') security services with a whole-of-NEM perspective;
- changing the directions reporting; and
- introduces a new annual reporting requirement on AEMO (known as 'transition plan for system security').

Key benefits

The AEMC's final determination highlights the following benefits of the rule change:

- Enhancements to the existing procurement frameworks and expansion to include the transitional NMAS services framework, combined with AEMO's operational enablement, should improve AEMO's ability to maintain power system security.
- Procurement of security services provides consumers with better assurance that power system security needs will continue to be met through the transition.
- Should reduce market interventions to maintain system security and improves transparency for participants (plants) that are providing these services.
- The final rule amends existing frameworks, systems and understandings of the power system to keep costs and complexity as low as possible.
- The rule makes a number of improvements to promote transparency and predictability of system security needs and the frameworks to meet these needs.

Changes to be delivered

The final rule places a complex set of obligations on AEMO to schedule resources that are contracted for system strength, inertia, NSCAS and transitional services. The project includes the development of a scheduler and related procedures for AEMO to enable security services in operational timeframes.

The table below sets out a high-level scope for the initiative which is subject to industry consultation as required. The final rule determination makes consequential changes to several procedures and documents and introduces new procedures and guidelines. Details of all procedure changes and initial solution design is available in AEMO's High Level Implementation Assessment (HLIA) v0.1. AEMO expects to publish HLIA v0.2 in late November 2024, which will provide further information on system impacts including market interfaces.

Procedures & Guidelines	Market Applications	Market Interfaces
New procedures and guidelines: • Security Enablement Procedure (Provisional) - Implemented 30 June 24 • Transitional services guideline, Transition plan for system security – by 1 Dec 24 Updates to existing procedures and guidelines (sample only): • Inertia Requirements Methodology • NSCAS Description and Quantities procedure	AEMO to develop a tool or system for enablement which: • identifies system security needs close to operational time. • decides which is the lowest-cost set of security contracts to meet these needs. • communicates enablement decisions to participants. Further details to be provided in AEMO's HLIA V0.2.	Details to be provided in AEMO's HLIA V0.2.

Procedures & Guidelines	Market Applications	Market Interfaces
• Constraint formulation Guidelines		

Further details on the changes proposed are available via the ISF page of AEMO's website here.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

- Generators (Scheduled and Semi-Scheduled)
- Integrated Resource Providers
- Transmission Network Service Providers

AEMO Teams

- Operations (Energy Market Modelling, Systems Capability, NEM RTO, Settlements & Prudentials)
- Digital (Enterprise Architecture, Enterprise Application Services (Wholesale Solutions))
- System Design (Planning, Engineering, Registrations)

Next steps

- AEMO to publish HLIA v0.2 in late November 2024.
- AEMO commenced consulting on the Transitional Services Guideline on 31 July 2024 with a draft report and guideline published 27 September 2024. The final report is due to be published by 22 November 2024.
- 1 December 2024 – New inertia framework to commence, revisions to TNSP cost recovery for non-network system security costs will commence, AEMO to publish first transition plan report for system security.
- 31 August 2025 – AEMO to publish full security enablement procedures.
- 2 December 2025 – Full enablement obligations on AEMO will commence (aligns to date by which system strength service providers must meet the new system strength standard).

Where can I find more information?

AEMC Improving Security Frameworks for the Energy Transition: https://www.aemc.gov.au/rule-changes/improving-security-frameworks-energy-transition

AEMO NEM Reform Program – Improving Security Frameworks for the Energy Transition: https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/improving-security-frameworks-for-the-energy-transition

Transmission & Access

Transmission Access Reform

Transmission Access Reform

Establishing mechanisms to address transmission congestion in both investment and operational timeframes.

Problem to be solved

Transmission congestion is expected to increase as the NEM transitions towards higher levels of variable renewable energy and flexible resources. Congestion cannot be addressed by the significant investment in transmission network augmentation alone. Moreover, it would not be efficient for the transmission network to be able to accommodate surplus generation. Nor is removing all congestion a desirable objective because to do so would incur significant costs for consumers. The current access regime does not use a market to ration access to constrained parts of the transmission network.

Transmission and Access

Key Dates

- AEMC TAR Consultation Paper – 24 APR 2024
- AEMC final TAR recommendations to Energy Ministers - SEP 2024

Solution

In February 2023, Energy Ministers tasked the ESB to work with senior officials and stakeholders on the development of a voluntary Congestion Relief Market (CRM) and Priority Access (PA) model.

- The CRM provides grandfathering of existing access to regional reference prices (RRP), incentives for cost-reflective bidding and so efficient dispatch, and the ability to opt-in to exposure to nodal prices (congestion relief market prices or CRMPs) to manage existing trading or contractual arrangements[10].
- The Priority Access model prioritises access to RRP, based on chronology of entry, and seeks to solve the "cannibalization" problem, whereby entrants can profitably locate in congested areas, by taking access from incumbents.[11]

At the November 2023 Energy and Climate Change Ministerial Council (ECMC) meeting, Energy Ministers agreed to progress the agreed transmission access reform and congestion management through further design work to be led by the AEMC having considered advice from the Energy Advisory Panel (EAP) and stakeholders.

In March 2024, the AEMC initiated a Transmission Access Reform (TAR) market review with a TAR project plan and Terms of Reference published. This review sought to build on the design of the model that was developed by the ESB together referred to as 'hybrid model'. The AEMC completed this review and provided feedback to Energy Ministers for their consideration in September 2024.

[10] AEMC. EPR0098 Transmission Access Reform Terms of Reference. Available here: https://www.aemc.gov.au/sites/default/files/2024-03/Transmission%20access%20reform%20-%20Terms%20of%20reference.pdf

[11] Ibid.

Key benefits

The primary benefits of a voluntary CRM[12] are to:

- improve dispatch efficiency by incentivising bidding behaviours in the CRM that achieve a lower system cost compared to today's market design;
- optimise the use of the transmission network that avoids overspend of the network and maximises the value of investment in interconnectors; and
- create market opportunities for storage and flexible demand by rewarding bidding behaviours that maximise wind and solar investments.

The primary benefits of priority access model[13] are to improve:

- the locational decisions of generation investments; and
- the ability of investors to manage congestion risk.

Changes proposed

Final project scope remains subject to ongoing policy development via the AEMC's TAR market review with final recommendations to Energy Ministers in September 2024.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final policy designs. Based on current designs / assumptions AEMO anticipate these impacts to be significant should a final policy position be determined.

AEMO Teams

Impacts to AEMO's teams are to be determined and subject to final policy designs. Based on current designs / assumptions AEMO anticipate these impacts to be significant should a final policy position be determined.

Next steps

- Final recommendations shared with Energy Ministers in September 2024.

Where can I find more information?

AEMC Market Review - Transmission Access Reform: https://www.aemc.gov.au/market-reviews-advice/transmission-access-reform

ESB Transmission and Access: https://esb-post2025-market-design.aemc.gov.au/transmission-and-access

Integrating DER and Flexible Demand

Unlocking CER benefits through flexible trading
Integrating price responsive resources into the NEM
Dynamic Operating Envelopes
Distribution Local Network Services
DER Data Hub & Registry Services
DER Operational Tools

Unlocking CER benefits through flexible trading

Establishing flexible trading arrangements to help consumers realise additional value from their customer energy resources.

Problem to be solved

There are material barriers which prevent or deter customers from accessing services which separate active, price-responsive resources from passive loads, so that they can be aggregated and traded in the market. For example, the establishment of second connection points to the Distribution Network Service Provider (DNSP) network are often blocked via DNSP's policy or costs, upfront and ongoing. Customers are prevented from obtaining competitive products and services for Consumer Energy Resources (CER), and CER is less able to actively participate in the market.

Integrating DER and Flexible Demand

Key Dates

- Final Determination - 15 AUG 2024
- AEMO Final High Level Implementation Assessment v0.1 - 26 SEP 2024
- Type 9 metering installations Go-live - 31 MAY 2026
- Full reform Go-live - 1 NOV 2026

Solution

Flexible trading arrangements enable the separation of controllable electrical resources (e.g., battery, solar system and electric vehicle charging) from passively connected electrical resources (e.g., household lighting and general appliances) in an end user's home or business. The AEMC's final determination provides new arrangements supporting the use and integration of flexible CER in the NEM, covering the areas below:

- Flexible trading with multiple energy service providers at large customer premises – the framework aims to leverage arrangements used under the current embedded network framework (voluntary, no regulated contractual relationship between financially responsible market participant (FRMPs) and there is a secondary settlement point (SSP) and subtractive settlement).
- Opportunities to optimise CER flexibility for small customers – establishment of a SSP(s) at small customer premises, while maintaining existing consumer protections. Provides the opportunity for household and small business to use their CER assets to generate, consume, store, and trade energy.
- Enabling innovation in metering technology to enable cost effective NEM connections where traditional metering cannot be accommodated (such as streetlighting and kerbside EV charging points). This innovation extends to SSPs, enabling simpler forms of metering CER within a customer's premises,
- A new accredited role, the NMI Service Provider will be responsible for creating NMIs at SSPs and maintaining the relevant standing data.

Key benefits

The unlocking CER benefits through flexible trading initiative seeks to:

- Provide large customers with increased choice from greater competition as energy providers could offer prices or incentives for these customers to operate their flexible load at lower cost. Similar benefits may be realised at a single property via increased competition, innovation and choice of network or retail pricing offers.
- Reduced barriers to entry for traders of CER that can help consumers obtain value from their DER assets or their flexible demand through participation in the wholesale market or provision of network support services.
- The management of controllable resources can also provide a market-driven response to issues affecting the energy system, such as minimum system load and directly benefiting the customer.
- The new metering types will encourage the deployment of public services such as smart street lighting and kerbside EV charging, and the adoption of SSPs via the flexible trading arrangements.

Changes to be delivered

The table below captures the main changes identified in AEMO's final high-level implementation plan.

Procedures & Guidelines	Market Applications	Market Interfaces
Consultation and updates to various procedures including: • MSATS Procedures • Metrology Procedures • Service Level Procedures • B2B Procedures • Registration documentation	High level system impacts include: • MSATS CATS (Change request process and new attributes to support SSP, new metering installation Type Codes, changes to various displays, new SDQ reports) • eMDM (Profile Allocation Engine, Settlement Allocation) • B2B (aseXML schema changes) • B2M (Support new B2M axeXML_r4(n) schema, Standing Data and Metering data access for DNSP's to child SSP) • Portfolio Management (New Validation of premises with SSP are ineligible for WDR) • Integration (aseXML Schema changes to include SSP attributes. Transformation and management of schema versions for B2B and B2M data exchange.) • AEMO provided software (B2B validation module, Participant Batcher, PDR Suite) • Capacity (Increased transaction volumes expected based on the estimated additional SSP devices added per year.)	• Standing Data and Metering data access for DNSP's to child SSP will be provided via an interface • B2M (and possibly the B2B Retail) payload formats for current exchange mechanisms will be enhanced as defined in Procedure updates. • Updates required throughout the MSATS Browser UI to reflect the additional fields added to CATS to support Secondary Settlement Points. • Reports impacted – Snapshot, CATS and SDQ Reports. • API – B2M & B2B updates to aseXML schema • MSATS Data Model Impacts – Additional attributes to record CP and SSPs in a PMA arrangement. • Schema Impacts to aseXML (B2M, B2B) and DERR.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

- Local Network Service Providers / Embedded Network Managers
- Market Customers / FRMPs (retailers or aggregators)
- NMI Service Provider

AEMO Teams

- Operations (Metering)
- Digital (Retail Solutions)

Market & Industry Stakeholders

- Metering Providers
- Metering Data Providers and Metering Coordinators

AEMO Teams

Next steps

- Q4 2024 – Q2 2025 pre-consultation workshops with DNSPs, Retailers and MCs/MPs/MDPs to support formal procedure consultation to commence in Q2 2025.
- Type 9 metering installations to be implemented by 31 May 2026 with the rest of the reform implemented by 1 November 2026.

Where can I find more information?

AEMC Rule Change Unlocking CER benefits through flexible trading: https://www.aemc.gov.au/rule-changes/unlocking-CER-benefits-through-flexible-trading

AEMO NEM Reform Program – Unlocking CER benefits through flexible trading : https://aemo.com.au/en/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/flexi ble-trading-arrangements

Integrating price responsive resources into the NEM

Establishing a voluntary mechanism to incentivise price-responsive resources to participate in the market scheduling process of the NEM.

Problem to be solved

Integrating DER and Flexible Demand

Key Dates

- Draft Determination - 25 JUL 2024
- AEMO Draft High Level Implementation Assessment v0.2 - 12 SEP 2024
- Final Determination - DEC 2024 (TBC)
- Go-live – May 2027 (TBC)

The forecast rapid growth in distributed resources, particularly those owned by household and business consumers, is drastically changing the energy landscape of the NEM. These resources are increasingly being aggregated into large portfolios and operated in response to price signals in a manner that is not visible to the market operator; that is, they currently operate outside the NEM dispatch and scheduling processes. This creates a range of operational challenges for AEMO for which its existing toolkit was not designed, particularly in managing complex operational conditions. The resources are also unable to participate in some services that are available to scheduled resources, such as regulation frequency control ancillary services (FCAS), limiting the value that customers can receive for their consumer energy resources (CER).

Solution

Integrating price responsive resources (IPRR) into the NEM would establish a voluntary mechanism to incentivise price-responsive, distributed resources to participate in market scheduling and dispatch processes of the NEM. The AEMC's draft determination establishes:

- A "Dispatch mode" framework that allows currently unscheduled price-responsive resources to be scheduled and dispatchable in the NEM, typically in aggregation. Resources could be nominated as a voluntarily scheduled resource (VSR) and aggregated together to participate in dispatch as one unit.
- A time-limited incentive scheme to drive participation in the mechanism in its early years. It does this by allowing AEMO to conduct tenders to pay participants to enter dispatch mode in the first five years of the mechanism. However, for the final determination the AEMC will be working with ARENA, the Commonwealth and jurisdictional governments regarding alternatives to having an incentive scheme in the NER.
- Monitoring and reporting obligations for AEMO and the AER to transparently evaluate the effect of price-responsive resources on the accuracy of AEMO's operational demand forecasts and the efficiency consequences of these effects.

Key benefits

Potential benefits from IPRR:

- Dispatch costs in the NEM – knowing when these resources will be used to reduce demand (particularly at higher cost times) improves demand forecasting and reduces the cost of resources that AEMO dispatches to meet demand.
- Energy prices in the NEM – by better matching supply and demand, the price of energy would be more efficient.
- Cost of security of supply in the NEM – by reducing the need for additional, potentially more expensive generation reserves to balance the market, system security will be achieved at lower cost.
- Reliability of supply in the NEM – the ability to schedule these available resources could improve planning and the use of lower-cost, lower-emission generation and lower intervention costs.
- Operation of distribution and transmission networks – longer-term accurate forecasts would improve network investments and planning, reducing network costs to consumers.

Changes proposed

The final scope and solution are subject to the AEMC's final rule determination. The table below captures the main changes identified in AEMO's draft high-level implementation assessment v0.2.

Procedures & Guidelines	Market Applications	Market Interfaces
New procedures and guidelines: • Voluntary scheduled resources (VSR) guidelines • AEMO price responsive reporting guidelines • VSR incentive procedures Updates will be required to a wide range of existing procedures and guidelines. Refer HLIA for details.	Implementing IPRR will involve changes to many AEMO systems. Of these, the following are most impacted: • Portfolio Management (PMS) - significant uplift in system usability and capability is required to support VSR activities. • Settlements, Billing & Payments – – Exclusion of VRSPs from the RERT cost recovery calculation – Exclusion of Contribution Factor calculated for VSRs from the FPP Residual – Calculation of VSR participation payments and associated VIM cost recovery • Demand Forecasting - The stop/start nature of telemetry from VSRs during hibernation will require either manual work to keep models up-to-date or complex logic to deal with the conditional treatment of these inputs to produce accurate forecasts. Refer to HLIA for the remaining system changes.	• Potential changes to various packages of the MMS Data Model. • Potential impacts to technical specifications: EMMS, EMMS Data Model, MSATS. • Schema Impacts – No changes identified for B2M, B2B and CDR/CDP JSON Schema. – Bidding JSON Schema a new field for VSR participation status if this becomes an attribute in bidding, otherwise no identified impact.

Further details on the changes proposed are available via the IPRR page of AEMO's website here.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

- Market Participants opting to participate in IPRR (may include Retailers/Market Customers, IRPs, Small Resource Aggregators, Non- Scheduled Market Generators and other VPP operators/ aggregators)
- TNSPs and DNSPs

AEMO Teams

- Operations (Planning, Forecasting, Electricity Market Monitoring, Settlements)
- System Design (Registrations)
- System Design (Forecasting, Planning)
- Digital (Cloud, Platforms, Infrastructure & Networks), Cyber Security, Strategy, Insights & Architecture, Enterprise Application Services)

Next steps

- AEMC Final Determination anticipated by 19 December 2024. AEMO to publish final HLIA in February 2025 (TBC).
- The commencement date of IPRR is yet to be determined. AEMO has recommended to the AEMC, a commencement in May 2027.

Where can I find more information?

AEMC Rule Change Integrating Price Responsive Resources into the NEM:
https://www.aemc.gov.au/rule-changes/integrating-price-responsive-resources-nem

AEMO NEM Reform Program – Integrating Price Responsive Resources into the NEM:
https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/integrating-price-responsive-resources-into-the-nem

Dynamic Operating Envelopes

Setting export and import limits dynamically to better manage distribution network utilisation and congestion.

Problem to be solved

There is a need for a system-wide standard to manage the bi-directional energy flows into the NEM from CER to help manage known issues across the power system such as (but not limited to) minimum system load and local congestion. At present, these limits are static (or fixed) which is likely to result in lower export limits for newer connections as networks become increasingly congested. Dynamic limits have the potential to better manage congestion on the distribution network and allow for more flexibility in exporting. These are referred to as dynamic operating envelopes (DOEs) that provide upper and lower bounds on the import and export of power during a given time interval.

Integrating DER and Flexible Demand

CER Roadmap: P.1. Enable consumers to export and import more power to and from the grid

Key Dates

- Publication of National CER Roadmap - 19 JUL 2024
- AER Final Export Limit Guidance Note - OCT 2024

Solution

To date, DOEs have been considered through a number of industry trials and market reviews including by AEMO (Project EDGE, Project Symphony), market reviews (DEIP DOE Whitepaper, DSPI, Review of the Regulatory Framework for Metering Services). Further, certain DNSPs have started deploying DOEs as flexible export limits (FELs) across different jurisdictions (QLD, SA, WA). The Australian Energy Regulator (AER) has published its final guidance note for flexible export limits, intended to provide clarity on policy objectives and design principles for DNSPs when implementing and using FELs as a tool for managing network congestion and increasing available hosting capacity.

To implement DOEs as a mandatory requirement for all new DERs connecting to the grid would require the coordination of several key reforms, including:

- Establishing new connection agreements with customers that refer to these dynamic limits, and the obligations of the customer, via the retailer / aggregator to maintain these limits.
- DNSPs to develop capacity allocation principles on how to fairly allocate these limits to different customers at times when constraints are required.
- New obligations on the retailer / aggregator to operate DER within these limits, where they are operating DER on behalf of customers.
- Creating new standards for interoperability and cyber security so that DER devices communicate in a standard manner, support a simple process to switch from one provider to another, and enable any provider to ensure compliance with DOEs.

On 19 July 2024 Energy Ministers agreed to publish the National CER Roadmap produced by the interjurisdictional CER Working Group established under the National Energy Transformation Partnership. DOEs

have been captured in the CER Roadmap under National Reform Priority *P.1 – Enable consumers to export and import more power to and from the grid*. The development of DOEs in the future will be subject to outcomes of this work.

Key benefits

There are various benefits that may be realised from the establishment of DOEs including increased network utilisation, improved coordination of access, improved CER optimisation, improved investment cases for network investment, efficient operation of the power system and market, and unlocking value for those customers with CER.

Changes proposed

The project scope remains subject to ongoing policy development and design but may entail:

- Establishing DER technical standards (e.g., communications and interoperability)
- Developing capacity allocation rules, monitoring and compliance advice, and
- Establishing a connection agreement framework.

At this stage it is expected that AEMO's scope of work is limited to the receipt and sharing of DOE related information.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final policy designs. Based on current designs / assumptions AEMO anticipate these impacts to be limited to DNSPs, retailers, aggregators and VPPs.

AEMO Teams

Impacts AEMO teams are to be determined and subject to final policy designs. Based on current designs / assumptions AEMO anticipate impacts to its Operational and System Design teams. AEMO's exact level of involvement is subject to final scope.

Next steps

AER's Final Export Limit Guidance Note published 23 October 2024.

Where can I find more information?

DCCEEW National CER Roadmap: https://www.energy.gov.au/energy-and-climate-change-ministerial-council/working-groups/consumer-energy-resources-working-group/national-cer-roadmap

AEMO Project EDGE Final Report (Chapter 4): https://aemo.com.au/-/media/files/initiatives/der/2023/project-edge-final-report.pdf?la=en

AER Final Export Limit Guidance note: https://www.aer.gov.au/system/files/2024-10/Export%20Limits%20Guidance%20Note.pdf

Distribution Local Network Services

Efficient provision of local network service between DER aggregators and distribution system operators.

Problem to be solved

Large scale penetration of DERs could be utilised by networks to defer, or displace network augmentations, and assist them in actively managing power flows on their network. Currently, however, DNSPs rarely procure services from DER and do so in bespoke bilateral contracts that lead to high transaction costs.

Solution

To identify ways to make it easier for DER aggregators to trade local network support services with DNSPs / Distribution System Operators (DSOs), through greater visibility of local network constraints aligning the definitions of local services and how they are traded between regions.

Integrating DER and Flexible Demand

CER Roadmap: P.5. Redefine roles for power system operations

Key Dates

- Publication of National CER Roadmap - 19 JUL 2024

On 19 July 2024 Energy Ministers agreed to publish the National CER Roadmap produced by the interjurisdictional CER Working Group established under the National Energy Transformation Partnership. Distribution Local Network Services align with National Reform Priority *P.5 – Redefine roles for power system operations* of the CER Roadmap. Future consideration of distribution local network services will be subject to the scope and outcomes of this work.

Key benefits

Potential benefits from efficient provision of local network services may include increased network utilisation and potential deferral of network augmentation, improved DER optimisation, improved investment cases for network investment through being able to identify the cost of managing constrained parts of the network, efficient operation of the power system and market and unlocking value for those customers with DER.

Changes proposed

The project scope remains subject to ongoing policy development and design but may entail:

- Development of guidelines to align the definition of local services and how they are traded (for instance via standardised bilateral contacts) between regions to make it easier for aggregators operating across regions to engage and deliver local network services for DNSPs as DER penetrations grow.

  The guideline could also outline the information DNSPs should publish, over and above what is required in the Distribution Annual Planning Reports (DAPRs), in relation to network constraints and network service requirements, and how that information should be made available.

- Evaluation of how local services interact with dynamic operating envelopes and dynamic network tariffs – for instance networks could utilise DOE and dynamic tariffs in the first instance to manage power flows but could then procure a service to give them greater certainty when managing persistent constraints.

At this stage it is assumed that scope relating to AEMO is limited to a simple platform for DSO and aggregators to exchange information on local service requirements and supply.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final policy designs. Based on current designs / assumptions AEMO anticipate these impacts to be limited to distribution network service providers, distribution system operators, retailers, aggregators and VPPS.

AEMO Teams

Impacts to AEMO teams are to be determined and subject to final policy designs.

Next steps

Subject to the workings of the National CER Roadmap and Taskforce.

Where can I find more information?

DCCEEW National CER Roadmap: https://www.energy.gov.au/energy-and-climate-change-ministerial-council/working-groups/consumer-energy-resources-working-group/national-cer-roadmap

AEMO, Mondo, AusNet Services. Project EDGE Final Report October 2023, Chapter 7: https://aemo.com.au/-/media/files/initiatives/der/2023/project-edge-final-report.pdf?la=en

DER Data Hub and Registry Services

Establishing a central platform for DER data exchange between DNSPs, aggregators and AEMO.

Problem to be solved

DER coordination at scale requires high volumes of data and signals to be exchanged between many organisations. For instance, DNSPs sending DOEs or dynamic tariffs to customer agents, and retailers sending exports limits to customer agents to manage negative spot price exposures.

Exchanging data relating to significant volumes of DER without consistent data models, and commands would add unnecessary and material costs to consumers, whilst restricting innovation and raising barriers to entry as seen in the UK[14]. Efficient and scalable DER coordination requires systems thinking and consistent approaches.

Integrating DER and Flexible Demand

CER Roadmap: M.2. Data sharing arrangements to inform planning and enable future markets

Key Dates

- Publication of National CER Roadmap - 19 JUL 2024
- AEMO CER Data Exchange Industry Co-Design Consultation Paper – 24 OCT 2024

Solution

Establishment of a DER Data Hub to provide efficient and scalable data exchange and registry services for DER between industry actors (Customer Agents, DNSPs, retailers, AEMO where Customer Agent to device communications is addressed in technical standards processes). The DER Data Hub could also use digital identities to enable more efficient and permission-based sharing and access to information, which could link to an augmented DER Register that contains more than just standing data.

On 19 July 2024 the CER Roadmap was published by the interjurisdictional CER Working Group established under the National Energy Transformation Partnership. The DER Data Hub and Registry Services aligns with National Reform Priority *M.2 – Data sharing arrangements to inform planning and enable future markets* of the CER Roadmap. Future consideration of DER data hub will be subject to outcomes of this work and industry initiatives.

Key benefits

Potential benefits from establishing a DER data hub include more efficient and scalable exchange of data between DER-related actors through standardised exchange and communication standards; ability for customer agents / aggregators operating to receive DOEs from all DNSPs or export limits from retailers through one connection, allowing for consistent signals to be sent from DNSPs to customer agents for triggering / delivery of local network services.

[14] AEMO, Mondo, AusNet Services. Project Edge – Final Report, UK Energy Digitalisation: digital spine, page 267. Available here: project-edge-final-report.pdf

Changes proposed

The DER Data Hub would be a central platform for data exchange between DNSPs, aggregators and AEMO as well as enhanced registry services for DER. The project scope remains subject to ongoing policy development / design and industry initiatives such as the CER Data Exchange Industry Co-design project (below).

Project EDGE[15] (a collaboration between AEMO, AusNet Services and Mondo) trialled a proof-of-concept DER Data Hub based on a common, open-access messaging infrastructure that:

- Allowed multiple participants (retailers and DER aggregators) and DNSPs to send, receive, and authenticate messages based on the roles that have been issued to and associated with their self-managed identity;
- Allowed participants, DNSPs, and AEMO to exchange diverse datasets, ranging from real-time telemetry to bulk file uploads, in support of multiple DER use cases; and
- Required only a single integration mechanism with a central infrastructure in order to communicate via one:one (bilateral), one:many (broadcast), and many:many (multicast) channels.

CER Data Exchange Industry Co-Design (a collaboration between AEMO, AusNet Services supported by ARENA) is a collaborate with industry and consumer stakeholder groups to develop a high-level design for a national CER Data Exchange and Implementation Roadmap. This project is the first step of a multi-stage process that seeks to create a digital foundation that supports multiple organisations to share CER-related information through a secure exchange. The CER Data Exchange Co-Design is currently conducting targeted workshops with stakeholders on initial co-design.

The project will recommend a high-level design based on industry feedback and preferences which will inform a separate subsequent detailed design and implementation initiative.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final policy designs. Based on current designs / assumptions AEMO anticipate these impacts to be limited to distribution network service providers, distribution system operators, retailers, aggregators and VPPS.

AEMO Teams

Impacts to AEMO teams are to be determined and subject to final policy designs.

Next steps

Subject to industry initiatives and establishment and workings of the National CER Roadmap and Taskforce.

[15] AEMO, Mondo, AusNet Services. Project Edge – Final Report, Chapter 6. Available here: project-edge-final-report.pdf

Where can I find more information?

DCCEEW National CER Roadmap: https://www.energy.gov.au/energy-and-climate-change-ministerial-council/working-groups/consumer-energy-resources-working-group/national-cer-roadmap

CER Data Exchange Industry Co-Design: AEMO | CER Data Exchange Industry Co-Design

AEMO, Mondo, AusNet Services. Project EDGE Final Report October 2023: https://aemo.com.au/-/media/files/initiatives/der/2023/project-edge-final-report.pdf?la=en

AEMO, Mondo, AusNet Services. Project Edge – DER Data Hub Lessons Learnt. https://aemo.com.au/-/media/files/initiatives/der/2023/project-edge-der-data-hub-lessons-learnt-final-june-2023.pdf?la=en

DER Operational Tools

New DER operational tools to support interactions between AEMO and DNSPs.

Problem to be solved

New operational tools relating to DER, and interactions between AEMO and DNSPs, will be required to maintain power system security at times when the entire NEM demand could be met with distribution connected resources. AEMO, transmission network operators and DSOs will need to collaborate and communicate in a greater capacity to ensure the system services required to maintain security will be provided in the most cost-effective manner.[16]

Integrating DER and Flexible Demand

Key Dates

- Subject to future collaboration between AEMO & DNSPs and progression of AEMO's Operations Technology Roadmap and CER Roadmap priorities

Solution

To identify and develop, in collaboration with DNSPs, new DER operational tools that may be required by each party, which can work together to maintain efficient and secure power system operations at times when up to 100% of system load can be met with DER. For AEMO, this project builds on the work of the Operations Technology Roadmap and consideration of the operational tools that control room staff will need in future.

On 19 July 2024 The CER Roadmap was published by the interjurisdictional CER Working Group established under the National Energy Transformation Partnership. The progression of the DER Operational Tools initiative will be subject to the scope and outcomes of this work.

Key benefits

The key benefits from this initiative will be the continued power system security when operating at very high penetrations of DER potentially lowering overall costs for all consumers. As well as the enablement of more dynamic operations of the distribution network by DNSPs (with visibility shared with AEMO) allowing for continued local network security and the hosting capacity of the distribution network maximised.

Changes proposed

The project scope remains subject to future engagement between AEMO and DNSPs to understand what DER operational tools/capabilities they will each need to fulfil their respective roles in future, and how those tools/capabilities will need to interact to maintain local and overall power system security.

[16] AEMO submission to parliamentary inquiry on Modernising Australia's Electricity Grid. Available: https://www.aph.gov.au/Parliamentary_Business/Committees/House/Environment_and_Energy/modernelectricitygrid/Submissions

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final policy designs. Based on current assumptions AEMO anticipate these distribution network service providers only.

AEMO Teams

Impacts to AEMO teams are to be determined and subject to final policy designs.

Next steps

Subject to progression of AEMO's Operations Technology Roadmap and the establishment and workings of the National CER Roadmap and Taskforce.

Where can I find more information?

DCCEEW National CER Roadmap: https://www.energy.gov.au/energy-and-climate-change-ministerial-council/working-groups/consumer-energy-resources-working-group/national-cer-roadmap

AEMO Operations Technology Roadmap: https://aemo.com.au/en/initiatives/major-programs/operations-technology-program/operations-technology-roadmap

Data Strategy

Data Services
Electric Vehicle Data
Bill Transparency
Network Visibility

Data Services

Establishing a new Data Services unit within AEMO to share protected data between trusted "prescribed" bodies.

Problem to be solved

Access to data is rarely sufficient to increase its value and impact, as safely sharing or analysing large-scale data sets requires access to advanced skills and systems, as well as clear data curation, management, and approvals processes. These organisational barriers can limit and delay benefits to a range of stakeholders, including consumers, policymakers and Market Participants.

Data Strategy

Key Dates

- Subject to passing of South Australia National Energy Laws Amendment (Data Access) Bill 2023

Solution

Establishment of a Data Services unit within AEMO and supported by a Stakeholder Advisory Group to share protected data safely with trusted "prescribed" bodies Class A and B.[17]

Key benefits

Establishment of a data services unit can address key identified barriers to sharing data with policy makers, planners and researchers, to support more informed evidenced-based policy, particularly critical in managing the energy transition. Further, data is critical to better understand how different consumer behaviours and needs are changing and being impacted by the energy transition, informing forecasting, investments, new services, and consumer protections.

Changes proposed

AEMO are in the early stages of the initiation and planning phase assessing how it would implement its new legislated functions as documented in the National Energy Laws Amendment (Data Access) Bill 2023 should it be passed.[18] AEMO note, additional non-legislative controls to be implemented would include:

- Publication of standard terms and conditions that apply to each class of body that may receive protected information from AEMO.
- Publication of supporting guidelines with principles and processes relating to, for example, data release, data management and curation, technical matters and standards and emerging technologies.
- A register of data AEMO has shared, to support robust tracking and compliance, as well as publicly accessible summary information to support transparency; and

[17] Class A – those who have prescribed statutory functions either specific to the energy industry, who work with energy data for public purposes, or who are already listed in the NEL and NGL, and Class B – Public bodies and researchers who can create clear benefits for energy consumers through greater access to data but require clear data protection obligations to ensure security. Refer https://www.datocms-assets.com/32572/1681166615-esb-data-strategy-initial-reforms-draft-legislation-consultation-paper-april-2023.pdf for the ESB's proposed list of Class A and B bodies.

[18] Parliamentary Counsel's Committee. National Energy Laws Amendment (Data Access) Bill 2023. Available here: https://www.datocms-assets.com/32572/1681166642-esb-data-strategy-initial-reforms-draft-bill-april-2023.pdf

- AEMO may also consider appropriate accreditation requirements for data requesters in some cases.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final law changes. Based on current assumptions AEMO anticipate no impacts to market or industry stakeholders.

AEMO Teams

Impacts to AEMO teams are to be determined and subject to final law changes and AEMO's internal initiation and planning assessment.

Next steps

Implementation of these reforms are subject to the South Australian parliament passing the National Energy Laws Amendment (Data Access) Bill 2023.

Where can I find more information?

ESB Data Services Policy Position Paper: https://www.datocms-assets.com/32572/1688102997-esb-data-strategy-initial-reforms-policy-positions.pdf

ESB National Energy Laws Amendment (Data Access) Bill 2023: https://www.datocms-assets.com/32572/1681166642-esb-data-strategy-initial-reforms-draft-bill-april-2023.pdf

Electric Vehicle Data

Improving visibility of electric vehicles as it relates to the electricity industry, to governments and to industry participants *(formerly Electric Vehicles Supply Equipment Standing Data Register).*

Problem to be solved

Electric vehicle (EV) charging is set to transform our electricity systems. While there is some uncertainty regarding the exact pace of adoption of EVs and the technology and charging choices of EV owners (including the use of public charging infrastructure), there is broad consensus that EV integration presents both major opportunities and challenges for the electricity grid.[19]

Currently, networks and AEMO do not have access to reliable data on the size, location, and characteristics of electric vehicle supply equipment (EVSE) to enable them to determine and manage these opportunities and challenges effectively.[20] The opportunity is to provide a solution for improving visibility of electric vehicle information through collecting and sharing data related to the location and characteristics of EV and EVSE.

Data Strategy

CER Roadmap: M.2. Data sharing arrangements to inform planning and enable future markets

Key Dates

- Publication of National CER Roadmap - 19 JUL 2024
- AEMO retraction of rule change - 8 OCT 2024

Solution

In December 2023, AEMO submitted a rule change request for the AEMC's consideration providing for extension of the DER Register to include EVSE data.[21] At the time of the Rule change request, AEMO had identified challenges in relation to existing limitations in the compliance and enforcement framework for Consumer Energy Resources (CER), which would have a direct effect on the quality and completeness of data collected. After the Rule change proposal submission, AEMO identified additional challenges related to the reporting trigger necessary to ensure distribution network service providers (DNSPs) can be made aware of EVSE installations across their network. These challenges could not be rectified in the National Electricity Rules (NER).

On 19 July 2024 Energy Ministers agreed to publish the National CER Roadmap produced by the interjurisdictional CER Working Group established under the National Energy Transformation Partnership. The roadmap commits to an operational national regulatory framework for CER in 2026, which has been endorsed as a suitable solution to support the effective collection of standing data for EVSE from 2027. To align with these changes and positions, AEMO has retracted the EVSE standing data Rule change request and committed to pursue a non-regulatory work program in the short-term to capture other data relevant to EV charging, while working with the interjurisdictional CER Working Group on the design of a future regulatory framework for improving EV and EVSE visibility. AEMO have therefore rebranded the EVSE initiative as “Electric Vehicle Data”

[19] ESB. Electric Vehicle Supply Equipment Standing Data. Consultation Paper. December 2022. Available here: https://www.datocms-assets.com/32572/1670367035-esb-electric-vehicle-supply-equipment-standing-data-consultation-paper-december-2022.pdf

[20] Ibid.

[21] AEMC Rule Change Pending. Electric vehicle charger data in DER register. Available here: https://www.aemc.gov.au/rule-changes/electric-vehicle-charger-data-der-register

(EVD) as it encompasses data beyond just supply equipment data. AEMO commenced its non-regulatory work program in September 2024.

Key benefits

Electric vehicle information and visibility can support the energy transition by supporting network and system planning and forecasting, managing the risks associated with different types of charging devices, and providing a better understanding of EV uptake and charging to help unlock their inherent flexibility.

Changes proposed

The project scope remains subject to future engagement between AEMO, stakeholders and the CER Working Group.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final design.

AEMO Teams

Impacts to AEMO teams are to be determined and subject to final design.

Next steps

- AEMO will be working closely with the CER Working Group on the longer-term regulatory framework for EVSE standing data collection.
- AEMO has stakeholder consultation planned over November and December 2024 for its non-regulatory EV data work program, and a recommendations paper in February 2025.

Where can I find more information?

AEMO Electric Vehicle Supply Equipment – Rule change retraction:

AEMO - Retraction EVSE Standing Data Rule Change Request.pdf (aemc.gov.au)

ESB Electric Vehicle Supply Equipment Standing Data – Consultation Outcomes Report June 2023 https://www.datocms-assets.com/32572/1688103470-attachment-b-evse-standing-data-consultation-paper-final-june-2023.pdf

DCCEEW National CER Roadmap: https://www.energy.gov.au/energy-and-climate-change-ministerial-council/working-groups/consumer-energy-resources-working-group/national-cer-roadmap

Bill Transparency

Addressing priority gaps in energy information required for government policy makers, regulators and market bodies, to inform decision making to support better consumer outcomes.

Problem to be solved

Electricity is an essential service – it is a core input into economic production and impacts living standards. This means that electricity costs and affordability will always be of central concern to governments. Rising electricity bills contribute to cost-of-living pressures on consumers and inflation, government and regulatory decision makers need to better understand financial billing outcomes, whether markets are driving efficient outcomes and how vulnerable groups are being impacted.

In June 2023 the ESB published its Consultation Paper which emphasis the increasing importance of understanding, what drives consumer behaviour, what consumers pay for electricity, and how different services impact bills and choices.[22] This is a high priority gap in energy information required for government policy makers, regulators and market bodies, to inform decision making to support better consumer outcomes.

Data Strategy

CER Roadmap: M.2. Data sharing arrangements to inform planning and enable future markets

Key Dates

- ESB Consultation Paper - JUL 2023
- AEMC project to proceed in 2024-2025

Solution

The ESB had considered and consulted on the current approach to collection and use of billing data, as well as potential alternative approaches that could improve transparency of electricity billing data. This work will now be taken forward by the AEMC with a final solution to be determined as part of its market review into Billing Data Transparency.[23]

AEMO note, one of the four options considered by the ESB was to empower a single body (possibly AER or AEMO) is to gather retailer-held billing data in a cost-efficient and timely way and share it safely with approved trusted data users, including jurisdictional and market bodies.

Key benefit

Increasing bill transparency data for government policy makers, regulators and market bodies can:

- support retail energy market policy development and associated outcomes, including reducing costs and affordability through more transparency in competition and reforms.

[22] Energy Security Board. Bill Transparency Consultation Paper. July 2023. Available here: https://www.aemc.gov.au/sites/default/files/2023-08/esb-billing-transparency-consultation-paper-final-july-2023.pdf

[23] AEMC Market Review – Billing Data Transparency. Last Accessed 22 April 2024. Available here https://www.aemc.gov.au/market-reviews-advice/billing-data-transparency

- provide for more effective and less costly consumer protections, particularly associated with new technologies and services, such as flexible trading arrangements.
- streamline price reporting, reducing duplication.
- support for more accurate forecasting through greater awareness of how consumers respond to price signals.

Changes proposed

The project scope remains subject to the outcomes of the AEMC's market review into billing data transparency.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final policy designs. Based on current assumptions AEMO anticipate these impacts to be limited to Retailers only.

AEMO Teams

Impacts to AEMO teams are to be determined and subject to final policy designs.

Next steps

The AEMC have signalled their intention to progress this project in 2024/25 having received submissions on the Consultation paper.

Where can I find more information?

AEMC Market Review – Billing Data Transparency: https://www.aemc.gov.au/market-reviews-advice/billing-data-transparency

ESB Bill Transparency Consultation Paper (July 2023): https://www.datocms-assets.com/32572/1688619055-esb-billing-transparency-consultation-paper-final-july-2023.pdf

Network Visibility

Provision of greater access to data on the performance of low voltage networks.

Problem to be solved

Consumer-driven rapid growth of CER (such as roof-top solar, batteries, electric vehicles, and active demand management) is creating a range of new benefits and choices for consumers and CER investors.[24] But at the same time, it is creating new challenges for managing the low-voltage distribution (LV) networks, where historically there has been little visibility or control.

While work continues to progress on improving how LV networks are monitored and managed, to ensure that networks and system operators have the capabilities they need to securely manage the system, decision-makers outside of the network (e.g., CER investors) still have limited visibility to make their own planning decisions and therefore are unable to manage their own network related risks.

Data Strategy

CER Roadmap: M.1. Enable new market offers and tariff structures to support CER uptake

Key Dates

- ESB Consultation Paper - JUL 2023
- Subject to the AER's Network Visibility review

Solution

The ESB set out to develop a pathway to deliver visibility of the low-voltage network to the market, including clear use cases and benefits, definitions of the data needed and appropriate arrangements for it to be delivered.[25] This initiative is to be undertaken in three phases:

- Phase 1 seeks to define the data sets concerning the performance of the LV network and CER that is needed by market and policy stakeholders making CER planning decisions and managing network-related risks, through examining the needs and use cases for this data and considering related challenges in accessing it.
- Phase 2 will test the challenges and value in delivering the data sets identified in Phase 1 through a range of real-world trials.
- Phase 3 will propose a pathway for ongoing delivery of priority data sets to the market, informed by the trials and considering varied opportunities and challenges for different networks.

This work will now be taken forward by the AER with a final solution to be determined as part of its review into Network Visibility.[26]

[24] Energy Security Board. Network Visibility Consultation Paper. July 2023. Available here: https://www.aer.gov.au/system/files/ESB%20-%20Network%20Visibility%20-%20July%202023.pdf

[25] Ibid.

[26] AER. Review – Network Visibility. Last Accessed 22 April 2024. Available here: https://www.aer.gov.au/industry/registers/resources/reviews/network-visibility

Key benefits

Greater visibility of the LV network will support the energy transition by:

- Enabling greater use of existing network capacity – existing data allowing DER and network service providers to target development around emerging constraints, managing their own risks and optimising local outcomes.
- Lowering DER constraints – empowering consumers, DER providers, and regulators to better engage with network to increase efficiency, understanding and acceptance of any DER constraints deemed necessary.
- Better targeting of network expansion – allowing for constraints and DER impacts of localised issues to be more transparently considered by alternative service providers and regulators.

Changes proposed

The project scope remains subject to the outcomes of the AER's market review into network visibility.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to final policy designs. Based on current assumptions AEMO anticipate these impacts to be limited to distribution network service providers only.

AEMO Teams

Impacts to AEMO teams are to be determined and subject to final policy designs.

Next steps

Subject to the AER's assessment of submissions to the ESB consultation paper as part of its ongoing Network Visibility review.

Where can I find more information?

AER Review – Network Visibility: https://www.aer.gov.au/industry/registers/resources/reviews/network-visibility

ESB Network Visibility Consultation Paper (July 2023): https://www.datocms-assets.com/32572/1688618798-esb-network-visibility-consultation-paper-final-july-2023.pdf

Foundational and Strategic Initiatives

Identity and Access Management
Industry Data Exchange
Portal Consolidation
SCADA Lite
FRC Target State
Dispatch, Bids/Offers, and ConstraintsTarget State

Identity and Access Management

Uplifting AEMO's foundational capabilities by providing a unified mechanism to authenticate and authorise external identity of participants accessing AEMO services – part of the Market Interface Technology Enhancements (MITE) work program.

Problem to be solved

AEMO's Identity and Access Management (IDAM) services are disparate, requiring users to retain multiple sets of credentials to access AEMO business services. The legacy IDAM services do not implement best practices in cyber security controls (e.g., multifactor authentication) and are insufficient to meet new industry obligations introduced under the Security of Critical Infrastructure (SOCI) Act.[27]

Foundational and Strategic Initiatives

Key Dates

- AEMO Final Business Case Package - JUL 2024
- Completion of initial consultation through MITEWG - end 1Q 2025

Solution

A unified mechanism to authenticate and authorise external identity when accessing AEMO services, consolidating and improving overall cyber security controls.

Key benefits

The IDAM initiative seeks to achieve a number of objectives including providing unified identification and authorisation for participants, greater scalability and adaptability in light of future reforms, improved user experience, enhanced security and compliance, enhanced self-service auditing and reporting and improved resilience and speed overall.

Changes proposed

AEMO has completed its consultation with stakeholders on the Final Business Case Package for its IDAM, Industry Data Exchange (IDX) and Portal Consolidation (PC) initiatives.[28] Industry support for the Business Case and its recommendations was sought and received at the Executive Forum 28th March 2024.

The scope for the IDAM initiative would include[29]:

- Define & implement target state identity and access management solution.
- Implement mandatory cybersecurity uplifts (such as SOCI) and advanced security capabilities such as identity federation, context-based authentication.

[27] AEMO. Final Business Case Package (IDAM, IDX and PC). July 2024. Available here: https://aemo.com.au/-/media/files/stakeholder_consultation/working_groups/other_meetings/nem-reform-foundational-and-strategic-initiatives-focus-group/fs-final-business-case.pdf?la=en&hash=C1E5245CD162A5E4705C71DF3B36690F

[28] Ibid.

[29] AEMO. Business Case Discussion – Session 6A. 22 January 2024. Available here: https://aemo.com.au/-/media/files/stakeholder_consultation/working_groups/other_meetings/nem-reform-foundational-and-strategic-initiatives-focus-group/session-6a--draft-business-case-discussion-idx-idam-pc-for-combined-business-and-technical-focus-gro.pdf?la=en

- Unify the identity and entitlement management stores within the NEM and lay the foundation to extend this capability to other markets such as Gas and WEM through other market initiatives.
- De-duplicate / consolidate the user accounts, providing the capability to use a single account to access business functions across multiple markets.
- Build organisation hierarchy.
- Enhance data-sharing capabilities to provide advanced data-sharing permissions.
- Enhance Participant Admin experience e.g., Assign multiple PIDs to a role minimising creating duplicate roles at an organisation level when an organisation has multiple PIDs.
- Basic and advanced Identity & Entitlement Management Governance & Assurance.

In August 2024, AEMO established the Market Interface Technology Enhancements Working Group (MITEWG). The objective of the MITEWG is to enable collaboration with industry to progress the planning and implementation of key deliverables which relate to market interface technology, such as IDAM, IDX and PC. This work is underway and focus groups have been established to collaborate with industry on the details of the preferred solution for IDAM and IDX initially.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Moderate impacts on all market and industry stakeholders who access AEMO's services.

AEMO Teams

The IDAM initiative will have high impacts on AEMO's Digital teams (including Enterprise Application Services, Cyber Security, and Cloud Platform Infrastructure & Networks).

Next steps

The initial consultation stage through the MITEWG is scheduled to be completed by the end 1Q 2025. Delivery timeframes are subject to the final requirements.

Where can I find more information?

AEMO Market Interface Technology Enhancements Working Group: https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/market-interface-technology-enhancements

AEMO Final Business Case Package (IDAM, IDX and PC) July 2024: https://aemo.com.au/-/media/files/stakeholder_consultation/working_groups/other_meetings/nem-reform-foundational-and-strategic-initiatives-focus-group/fs-final-business-case.pdf?la=en&hash=C1E5245CD162A5E4705C71DF3B36690F

Industry Data Exchange

Uplifting AEMO's foundational capabilities by providing a unified data exchange mechanism to support the secure and efficient exchange of data between energy stakeholders for new services – part of the Market Interface Technology Enhancements (MITE) work program.

Problem to be solved

AEMO's existing data exchange systems have been variously acquired over the last 10-15 years, and use inconsistent standards, protocols and formats. AEMO's markets are also undergoing significant transformation, resulting in new data exchange needs. AEMO introducing new data exchange patterns without a unified target state and roadmap is inhibiting participants from modernising their systems and quantifying the benefits of their investments.

Foundational and Strategic Initiatives

Key Dates

- AEMO Final Business Case Package - JUL 2024
- Completion of initial consultation through MITEWG - DEC 2024

Solution

The Industry Data Exchange (IDX) initiative seeks to establish a unified data exchange mechanism to support the secure and efficient exchange of data between energy stakeholders for new services required by NEM Reforms, existing legacy services and provide a framework extensible to other energy markets.

Key Benefits

The IDX initiative will provide industry standardized channels, protocols, and capabilities to provide a seamless integration of data exchange. In doing so, the initiative seeks to.

- efficiently consolidates the development of data exchange protocols for new business services – avoiding protocol 'bloat', minimising siloed development & improving speed to market for new reforms
- align with changing participant systems and cyber security obligations
- improves transaction timeliness and reduce incidences of stop files
- enable the scalable extension of existing business services [IDX Transition], and
- enable compartmentalisation of schema changes, thereby reducing regression testing costs of twice-yearly market changes [IDX Transition].

Changes proposed

AEMO has completed its consultation with stakeholders on the Final Business Case Package for its Identity and Access Management (IDAM), IDX and Portal Consolidation (PC) initiatives.[30] Industry support for the Business Case and its recommendations was sought and received at the Executive Forum 28th March 2024.

[30] Ibid.

The scope for the IDX initiative would include[31]:

- **DP1**: **IDX Foundational** – scope is to build capability that efficiently supports upcoming new reforms in a secure and extensible way. As part of this foundational phase the scope would include:
  - Enhance data exchange cyber controls implementing the legislative driven requirements and obligations such as SOCI, Australian Energy Sector Cyber Security Framework (AESCSF).
  - Define and implement target state channels, protocols, patterns and payload standards.
  - Unify the data exchange mechanisms across markets and fuels. Define the unified data exchange mechanisms for future Reforms.
  - AEMO data exchange software is enhanced to provide data exchange mechanisms that are defined in the target state architecture; minimising the gateway development costs for the industry covering all the channels that are defined in the target state architecture.
  - Transition the current state NEM interfaces to target state; sunset after an industry agreed timeframe.
- **DP2: IDX Transitional**[32] **–** assess options to address legacy IDX services taking into account learnings and exit criteria from delivery of the foundation and experience in the delivery of new business services. As part of this transitional phase the scope would include assessing options to transition existing NEM Retail, Wholesale and Transmission business services to the new foundational IDX patterns, protocols and payload formats.

In August 2024, AEMO established the Market Interface Technology Enhancements Working Group (MITEWG). The objective of the MITEWG is to enable collaboration with industry to progress the planning and implementation of key deliverables which relate to market interface technology, such as IDAM, IDX and PC. This work is underway and focus groups have been established to collaborate with industry on the details of the preferred solution for IDAM and IDX.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Moderate to high impacts on all market and industry stakeholders who access AEMO's services.

AEMO Teams

High impacts on AEMO's Digital (e.g., Enterprise Application Services, Cyber Security, and Cloud Platform Infrastructure & Networks) and Operations teams (e.g., Metering).

Next steps

The initial consultation stage through the MITEWG is scheduled to be completed by the end of 2024. Delivery timeframes are subject to the final requirements.

[31] AEMO. Business Case Discussion – Session 6A. 22 January 2024. Available here: https://aemo.com.au/-/media/files/stakeholder_consultation/working_groups/other_meetings/nem-reform-foundational-and-strategic-initiatives-focus-group/session-6a--draft-business-case-discussion-idx-idam-pc-for-combined-business-and-technical-focus-gro.pdf?la=en

[32] For this second phase and second decision point and new standalone business case is to be developed.

Where can I find more information?

AEMO Market Interface Technology Enhancements Working Group: https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/market-interface-technology-enhancements

AEMO Final Business Case Package (IDAM, IDX and PC) July 2024: https://aemo.com.au/-/media/files/stakeholder_consultation/working_groups/other_meetings/nem-reform-foundational-and-strategic-initiatives-focus-group/fs-final-business-case.pdf?la=en&hash=C1E5245CD162A5E4705C71DF3B36690F

Portal Consolidation

Establishing a new web and mobile user portal to provide a unified stakeholder experience – part of the Market Interface Technology Enhancements (MITE) work program.

Problem to be solved

AEMO browser services are exposed over a disparate range of end points and require multiple sets of credentials to consume these services. This results in a suboptimal user experience for energy stakeholders. The requirement to access browser services via private networks creates technical barriers to consuming these services.

Foundational and Strategic Initiatives

Key Dates

- AEMO Final Business Case Package - JUL 2024
- Commence collaboration through MITEWG - 1Q 2025

Solution

The Portal Consolidation (PC) initiative seeks to establish a new web and mobile user portal to provide a unified stakeholder experience. The portals framework is an enabling platform that supports energy market participants and other partners to consume AEMO browser services in a secure manner.

Key benefits

The Portal Consolidation solution will provide a consistent and unified user experience allowing for a standardised experience to consume AEMO browser services, enhanced self-service capabilities for market participants, integration with the enterprise identity management and user authentication solutions and overall improved user experience by establishing standards for navigation, look and feel and help menus.

Changes proposed

AEMO has completed its consultation with stakeholders on the Final Business Case Package for its Identity and Access Management (IDAM), Industry Data Exchange (IDX) and PC initiatives.[33] Industry support for the Business Case and its recommendations was sought and received at the Executive Forum 28 March 2024.

The scope for the PC initiative would include[34]:

- Enable a single pane of glass, providing a pathway for future unification across fuels and markets.
- Implement the capabilities defined in target state architecture e.g., self-serve capabilities, personalised features.
- Enable browser services to be accessible via the internet.
- Single identity for various browser services/web apps.

[33] Ibid.

[34] AEMO. Business Case Discussion – Session 6A. 22 January 2024. Available here: https://aemo.com.au/-/media/files/stakeholder_consultation/working_groups/other_meetings/nem-reform-foundational-and-strategic-initiatives-focus-group/session-6a--draft-business-case-discussion-idx-idam-pc-for-combined-business-and-technical-focus-gro.pdf?la=en

- Unify the user experience.
- Enhance user documentation.

In August 2024, AEMO established the Market Interface Technology Enhancements Working Group (MITEWG). The objective of the MITEWG is to enable collaboration with industry to progress the planning and implementation of key deliverables which relate to market interface technology, such as IDAM, IDX and PC. This work is underway and focus groups have been established to collaborate with industry on the details of the preferred solution for IDAM and IDX, with similar collaboration to commence in Q1 2025 for PC.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Moderate impacts on all market and industry stakeholders who access AEMO's services.

AEMO Teams

Moderate impacts on AEMO's Operations (e.g., Energy Market Monitoring, Systems Capability) and Digital (e.g., Enterprise Application Services) teams.

Next steps

The initial consultation stage through the MITEWG is scheduled to commence in Q12025. Delivery timeframes are subject to the final requirements.

Where can I find more information?

AEMO Market Interface Technology Enhancements Working Group: https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/market-interface-technology-enhancements

AEMO Final Business Case Package (IDAM, IDX and PC) July 2024: https://aemo.com.au/-/media/files/stakeholder_consultation/working_groups/other_meetings/nem-reform-foundational-and-strategic-initiatives-focus-group/fs-final-business-case.pdf?la=en&hash=C1E5245CD162A5E4705C71DF3B36690F

SCADA Lite

Establishing a bi-directional connection for non-NSP participants to exchange operational information (telemetry and control) with AEMO.

Problem to be solved

Foundational and Strategic Initiatives

Key Dates

- Go-live - 6 FEB 2025

The evolving and transitional NEM market will involve several new non-NSP (Network Service Provider) participants in addition to the already existing traditional ones (such as NSPs and Generators). While Supervisory Control and Data Acquisition (SCADA) systems are critical to the operation of the NEM's current scheduling framework, they are a significant entry barrier for smaller participants into central dispatch due to the granularity of data they communicate with AEMO's control rooms.

It has been onerous for these non-NSP participants to establish a telemetry connection with AEMO using the ICCP (Inter-control Centre Communications Protocol) protocol that AEMO currently supports.

Solution

SCADA Lite will enable NEM non-NSP participants to establish a bi-directional connection to exchange operational information (telemetry and control) with AEMO. Specifically, those requirements defined in both the Wholesale Demand Response Guidelines (Version 1.0, Effective Date: 24 June 2021) and Power System Data Communication Standard (Version 3.0, Effective Date: 3 April 2023).

Key benefits

Beyond enabling the exchange of operational information with AEMO, the SCADA Lite initiative offers a range of benefits to market stakeholders, consumers and AEMO, including:

- Providing greater visibility and operational control of network generation and ancillary service resources.
- Encouraging greater market participation of renewable energy sources into the market.
- Lowering barriers to entry into the market for NEM non-NSP participants.
- Access to additional revenue streams for non-NSP participants
- Greater opportunities for CER to participate in the NEM through dispatch or load management contracts by upstream aggregators.

Changes to be delivered

Procedures & Guidelines	Market Applications	Market Interfaces
• SCADA Lite solution will deliver the requirements defined in both the WDR Guidelines (Version 1.0, Effective Date: 24 June 2021) and Power System Data	• Business Process. Modification to existing processes is expected such as registration of new non-NSP participants, utilisation of SCADA Lite data in grid modelling and dispatch process, creation	• Potential for new technology and hardware that will be required to enable the bidirectional communication link with AEMO to provide telemetry and receive instruction signals

Procedures & Guidelines	Market Applications	Market Interfaces
Communication Standard (Version 3.0, Effective Date: 3 April 2023) • Registration is required for Demand Response Service Providers seeking to register >5MW of WDR from a single site/aggregation who do not provide telemetry via an NSP • Registration is optional for IRPs or Generators seeking a transitional SCADA Lite connection where the NSP does not support the service	of annual invoicing process for SCADA Lite users. • Technology Solution - Changes include configuration and implementation of new components in networks and real time operations.	• The solution will support both cloud-hosted (major Australian cloud providers) and physical infrastructure based non-NSP Participant Intervening Facilities (endpoints). • Protocols supported will be Secure ICCP (Inter-control Centre Communications Protocol), as well as the Secure DNP3.0 protocol (agreed with the industry participants through the Power System Data Communication Standard consultation) to establish this connection.

Market, Industry and AEMO impacts

Market & Industry Stakeholders[35]

- Demand Response Service Providers (opting to leverage SCADA Lite services)
- Virtual Power Plants (opting to leverage SCADA Lite services)
- Integrated Resource Providers (opting to leverage SCADA Lite services)
- Operators of remote grid scale assets (opting to leverage SCADA Lite services)

AEMO Teams

- Operations (Operational Support (Settlements & Prudentials), RTO Grid Systems and Modelling)
- System Design (Onboarding & Connections)
- Digital (Cloud, Platforms, Instructure & Networks, Customer, Engagement & Services, Enterprise Application Services)

Next steps

- AEMO development and internal testing to be completed by 13 November 2024 with a pilot test period 14 November to 10 January 2025.
- Technical “how-to” Guideline including specific instructions sets for both physical and virtualised end-point scenarios available in line with agreed milestones by 13 December 2024.
- Scheduled go-live 6 February 2025.

Where can I find more information?

AEMO NEM Reform Program – SCADA Lite: https://aemo.com.au/initiatives/trials-and-initiatives/scada-lite

[35] For those participants who choose to utilise this capability.

FRC Target State

Implement a consolidated Asset and Participant Relationship Management system (APRM) that enables unification of services onto a shared platform.

Note the Consolidated Master Data Repository initiative has now merged into this initiative. The FRC Target State initiative is currently subject to review as part of AEMO's ongoing Future State Architecture assessment.

Foundational and Strategic Initiatives

Key Dates

- Subject to AEMO's Future State Architecture assessment

Problem to be solved

AEMO currently maintains multiple applications to manage assets and participant relationships in the Retail Markets. Standing Data from these systems are copied (duplicated) to other downstream systems causing data latency and quality issues. The majority of these systems are bespoke with point-to-point integration and all of the Full Retail Competition (FRC) platforms are at the end of their technical life and require renewal. These applications also maintain their own and / or leverage multiple Master and Reference data repositories across the organisation. This has potentially adverse business implications for Participant experience and efficiency.

There are significant regulatory changes on the horizon that require significant investment to enhance and maintain these systems and new market reforms continue to introduce additional assets and/or additional characteristics of the assets requiring smart investments.

Solution

- Implement a consolidated Asset and Participant Relationship Management system (APRM) that enables unification of services onto a shared platform and simplification of Participants' and AEMO processes.
- Provide single access to AEMO's Retail systems (network, portal, hub, data access and system architecture) for Participants and potentially to non-Participants such as 3rd parties (e.g., under the Consumer Data Right for Energy reforms).
- Accommodate new market assets such as DER, and EV into AEMO grid and market solutions.
- Provide the foundation for unifying the procedure definitions, business processes, data exchange patterns and mechanisms, and AEMO systems across jurisdictions, markets and fuels.
- Implement systems changes to improve delivery of consolidated processes at lower cost to both Market Participants and AEMO.
- Simplify and consolidate disparate data through centralisation of Master Data. AEMO to provide Master Data as a service (in batch and real time).

Key benefits

The initiative seeks to improve operational performance by leveraging unified interface protocols and methodologies removing duplication efforts and costs for AEMO and Participants across the industry. Further, it

provides for easier market changes through reduced dependency on code changes allowing for more efficient and reduced costs of implementation of procedure changes, enabling third parties to provide system solutions at lower prices.

Finally, the initiative will align to AEMO's cyber security standards and minimised data movement across the organisation, improving data security, quality, latency, and accuracy.

From a Master Data perspective, this will further:

- Provide Participants the ability to access a single source of truth for all of their data allowing Participants to be able to provide one update that will map across various AEMO applications and remove the need for Participants to engage with multiple AEMO business units.
- Provide data as a service and simplify access for Participants to consistent quality data and simplified, unified information improving service and time efficiencies.

Changes proposed

The project scope remains subject to the outcomes of AEMO's Future State Architecture assessment.[36] AEMO published an Expression of Interest (EOI) to scan the Market to determine what platform/product are available as well as to refine the target state architecture. The responses to this EOI are to be factored into the design and implementation an Actor and Asset Management platform, including the solution architecture, and its technology stack.

The platform needs to enable consolidated procedures, interfaces, security standards, protocols, and support processes across all Retail Markets (the integration for non-NEM retail markets is outside the NEM Reform Program scope). The platform will extend to new assets such as DER, EVs and integrating it with the grid and other market systems. Following an assessment of initiative synergies, this now includes consideration of Master and reference data previously articulated as a separate initiative (Consolidated Master Data Repository).

Key steppingstones to get to the target state include Actor-Asset platform: NEM CATS; NEM wholesale registration process; Bring other processes and applications onto platform (e.g., DER Register).

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are to be determined and subject to AEMO's ongoing Future State Architecture assessment. Based on current assumptions AEMO anticipate impacts on all market and industry stakeholders who wholesale, retail and gas market participants.

AEMO Teams

Impacts to AEMO teams are to be determined and subject to its Future State Architecture assessment. Based on current assumptions AEMO anticipate impacts to its Operations and Digital teams.

[36] The Future State Architecture is a strategic blueprint for a contemporary digital ecosystem, encompassing processes, applications, technology, data and importantly security that will enable AEMO to deliver on our strategy across all functions and jurisdictions.

Next steps

- AEMO has published an Expression of Interest (EOI) to scan the market to determine what platform /product are available as well as to refine the target state architecture.
- Options assessment to be completed to determine if DER related initiatives should be on the platform (as opposed to other available options) and to sequence the changes on the platform.
- As per the IDAM, IDX and PC initiatives, AEMO seek to collaborate with industry to progress a business case assessment of the FRC Target State initiative in due course.

Where can I find more information?

Additional information to be made available subject to monitoring and assessment of target state requirements at various 'Checkpoints'.

Dispatch, Bids/Offers, and Constraints Target State

A technology uplift of AEMO backend market platform services to replace legacy technology.

Foundational and Strategic Initiatives

Key Dates

- Subject to ongoing monitoring and assessment of target state requirements

Problem to be solved

AEMO's core market dispatch and constraints platform is at the end of its technical life and the technologies which underpin this platform are legacy. There is a rapidly diminishing footprint of resources in the contract market with skills in these technologies available.

Solution

To modernise the core market dispatch and short-term market systems to align it with modern technologies that are widely supported in AEMO and for which external resources with those skill sets readily exist.

Key benefits

This initiative seeks to ensure the ongoing viability and maintainability of the core market dispatch and constraints platform – which are mission critical to enable secure and optimised participation by actors in various markets in the NEM.

The adoption of modern delivery frameworks will improve the ability of AEMO to deliver changes to these platforms which will be increasingly required as the energy transition continues. This will provide cost efficiency benefits and value to Participants through reduced implementation costs.

Changes proposed

This initiative will employ a phased approach subject to various Checkpoints. The final scope of each phase will be subject to review.

Tranche 1 – A tactical incremental solution to transition from end-of-life technology to a supported platform in order to eliminate immediate technology risks and provide an opportunity to apply more readily available technology personnel, thereby enhancing scalability and organisational delivery capability. This solution can be implemented without affecting regulatory reform initiatives related to NEM Reform Program.

Once this tactical uplift is completed, the dispatch ecosystem will be fit for purpose as a base solution for implementation of further reforms for the remainder of the NEM Reform Program, subject to defined checkpoints to assess i) any fundamental changes in the reform requirements (e.g., nodal pricing) and ii) performance and scalability requirements that may be impacted by forthcoming DER growth and initiatives.

Market, Industry and AEMO impacts

Market & Industry Stakeholders

Impacts to market and industry stakeholders are subject to future checkpoints. Tranche 1 changes have no market and industry stakeholder impacts.

AEMO Teams

Future impacts to AEMO teams are subject to future checkpoints. Tranche 1 changes have low impacts to its Digital teams.

Next steps

- Dispatch tactical uplift to be completed as per Changes Proposed.
- Ongoing monitoring and assessment of target state requirements at various ‘Checkpoints’ to assess i) any fundamental changes in the reform requirements (e.g., nodal pricing) and ii) performance and scalability requirements that may be impacted by forthcoming DER growth and initiatives.

Where can I find more information?

Additional information to be made available subject to AEMO’s ongoing Future State Architecture assessment.

Retail Electricity Market Improvements

Metering Services Review (Accelerating Smart Meter Deployment)

Metering Services Review (Accelerating Smart Meter Deployment)

Reform actions and improvements to the current regulatory framework to enable accelerated deployment of smart meters.

Problem to be solved

Households are becoming smarter and more autonomous over time and will be increasingly interacting with the grid and energy markets. Smart meters are an important tool to facilitate that interaction, and to support the cost-effective decarbonisation of the energy market. The current metering framework provides a pathway for legacy meters to be replaced over time, with smart meters being installed on a new and replacement basis, through customer requests and proactive deployments by retailers. However, this approach will not lead to smart meters being deployed fast enough to support the pace of transition of the future energy system.

Retail Electricity Market Improvements

Key Dates

- Draft Determination - 4 APR 2024
- AEMO Draft High Level Implementation Assessment V0.3 - 6 AUG 2024
- Final Determination - 28 NOV 2024 (TBC)
- Effective date 1 DEC 2025 for acceleration and 1 JUL 2026 for Power Quality Data (TBC)

Solution

The Metering Services Review (Accelerating Smart Meter Deployment) aims to identify reform actions and improvements to the current regulatory framework, to enable faster replacement of legacy meters. The AEMC's draft determination[37] includes the reforms set out below, paving the way for universal uptake of smart meters by 2030.

- Accelerating the deployment of smart meters across the NEM - sets a clear target in the NER for the accelerated deployment of smart meters between 2025-2030. Requires DNSPs to create a Legacy Meter Replacement Plan (LMRP) to schedule the replacement of their type 5 and 6 (legacy) metering installations. DNSPs must prepare a schedule for each 12-month period. Introduces new obligations on retailers to meet the target and a compliance monitoring role for the AER.
- Enabling better access to power quality data (PQD) - defines 'basic' PQD and allows DNSPs to access or receive 'basic' PQD. Imposes responsibilities and requirements on metering coordinators (MC) and metering data providers (MDPs) to enable better access for DNSPs.
- Providing customer safeguards - prohibit retailers from charging small customers any upfront costs or exit fees that relate to replacing a type 5 or 6 metering installation identified in an LMRP (this prohibition does not apply to new connections, or meter replacements initiated at the customer's request). Require retailers to

[37] The AEMC's draft determination is also shaped by the findings of the AEMC's Review of the regulatory framework for metering services, 30 August 2023. Available here: https://www.aemc.gov.au/sites/default/files/2023-08/emo0040_-_metering_review_-_final_report.pdf

provide their customers at least 30 business days' notice when transitioning them to a different pricing structure during the LMRP period because of a change in meter type, as well as information on how to understand and manage the change.

- Improving the customer experience in metering upgrades - expand the smart meter information retailers must provide to customers prior to any upgrades, enable customers to request a smart meter from their retailer for any reason, and require retailers to install a smart meter on receipt of such a request. Improve the meter malfunctions replacement framework.
- Reducing barriers to installing smart meters and improving industry coordination - remove the option for customers to opt-out of a new meter deployment. Reduce the number of notices that retailers send to customers before a new meter deployment from two to one. Establish a process for DNSPs, retailers and metering parties to install meters in shared fusing scenarios, such as multi-occupancy sites. Enable a process for retailers to encourage customers to remediate, as well as to track customer site defects.
- Creating a fit-for-purpose testing and inspection regime - exempts MCs from testing and inspecting legacy meters during the LMRP period. Clarifies the testing and inspection requirements for meters by refining how the testing requirements apply, requiring MCs to inspect smart meters in line with an asset management strategy (AMS) approved by AEMO and requiring AEMO to develop, maintain, and publish guidelines on the AMS submission and approval process within six months of the final rule being made.

Key benefits

The reform changes would benefit consumers by increasing the amount of information available about their energy use, allow consumers to better understand and manage their bills, and open up access to new and better retail service options. More broadly it would benefit all energy stakeholders by enabling a more efficient, lower-cost, and lower-emissions energy system.

Changes proposed

Deliverables of the MSR are separated into three packages to be developed and deployed to meet effective dates successfully.

- Package 1 - LMRP, Defects, one-in-all-in processes and matters critical to the go-live commencement.
- Package 2 - Testing and inspection guidelines, Metering installation malfunctions.
- Package 3 - Access to Power Quality Data.

The table below summarises the changes proposed for MSR based on the latest Draft HLIA V 0.3.

Procedures & Guidelines	Market Applications	Market Interfaces
Initial assessment of procedures and documents impacted: • B2B Procedures – Service Order Process, One Way Notification Process, Customer and Site Details Notification Process • MSATS – CATS, Standing Data • Metering procedures, guidelines and processes – Service Level Procedure	• Several updates to MSATS CATS to support Package 1 . Proposed design leverages the established MSATS CATS standing data, change request processing, data access, and data update frameworks. • Changes to existing B2B Transactions to support Package 1.	• B2B Validation Module shall be updated for Package 1, to account for the inclusion of additional enumerated values. • Participant Batcher shall be updated For Package 1, to account for B2M and B2B schema changes. • As part of the procedure development and consultation for Package 3, AEMO will specify requirements on the payload

Procedures & Guidelines	Market Applications	Market Interfaces
MDP Services, Metering Installation Malfunction Exemption, PQD Format (new), Asset Management Strategy Guideline (new) • Metrology Procedures and unmetered loads – Part A, Part B • Accreditation and Registration - Accreditation Checklists (Metering Providers, Metering Data Providers & Embedded Network Mangers), Guide to the Role of the Metering Coordinator	• SMP eHub - While there are no functional changes to SMP eHub's data exchange mechanisms to support Packages 1 or 2, changes to the B2B and B2M schema versions required under Package 1 have an indirect impact. • MSATS Browser - Updates are needed throughout the MSATS Browser UI to reflect the additional fields added to CATS for Package 1 and changes to introduce new CR codes. Additionally, the B2B Browser LVI requires new values to be added to existing dropdown lists in the 'Create New Transaction' screens to support Package 1 • Impacted Reports - MSATS Snapshot, CATS & RM • APIs - There are no additional API endpoints, API resources or protocol changes identified under Package 1 or 2. For Package 1 and 2, B2B Payload schema changes are required to include the necessary attributes for LMRP, Site Defects and One-In-All-In. • System impacts for Package 3 are yet to be determined.	format, protocols, and channels by which Power Quality Data shall be exchanged in the market. Until this has been undertaken, AEMO has insufficient information to define the Market system interface impacts for this package. • MSATS Data Model Impacts - B2M CATS_NMI_DATA support for the following new attributes (LMRP, Defect Flag, Site Remediation Status, Site Remediation Date)

Market, Industry and AEMO impacts

Market & Industry Stakeholders

- DNSPs
- Market Customers / FRMPs (retailers or aggregators)
- Metering Providers
- Metering Data Providers and Metering Coordinators

AEMO Teams

- Operations (Metering)
- Digital (Retail Solutions)

Next steps

- Subject to the AEMC's final rules determination Packages 1 and 2 are to be implemented by 1 December 2025 and Package 3, PQD by 1 July 2026.
- Package 1 procedure publication targeted for April 2025 (with effective dates aligned with the requirements of the rule). System changes in production by late October 2025.
- Package 2 procedure consultation commencement targeted over November 2024 to January 2025 (i.e. following the final rule). Procedure publication February 2025 to July 2025.
- Package 3 procedure consultation commencement around April 2025, following conclusion of the procedure development in packages 1 and 2. Procedure publication around September 2025. System changes over July 2025 to March 2026. AEMO to consider in consultation with interested parties the use of the Industry Data Exchange (IDX) platform for PQD.

Where can I find more information?

AEMC Rule Change Accelerating smart meter deployment: https://www.aemc.gov.au/rule-changes/accelerating-smart-meter-deployment

AEMO NEM Reform Program – Metering Services Review (Accelerating Smart Meter Deployment): https://aemo.com.au/en/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/metering-services-review---accelerating-smart-meter-deployment

Wholesale Electricity Market Reforms

Shortening the settlement cycle

Interregional settlement residue arrangements for transmission loops

ST PASA procedure and recall period

Shortening the settlement cycle

Shortening the settlement cycle to reduce working capital needs of retailers when meeting AEMO's prudential collateral requirements to cover accrued liabilities in the NEM.

Problem to be solved

The current 20 business day settlement cycle requires prudential collateral (credit support) that covers 35 days of accrued unpaid settlement amounts, plus a 7 day reaction period following any payment default.[38] The credit support requirements can be significant, particularly for smaller retailers that are less likely to have a corporate generation portfolio to offset their prudential position, and may have greater financing costs for (or must cash back) bank guarantees. Bilateral contracts between retailers and (typically) generators are usually only settled on the NEM final settlement date for the contract period, meaning retailers are required to provide credit support for wholesale exposure for which they may be fully hedged outside of the NEM.

Wholesale Electricity Market Reforms

Key Dates

- Draft Determination - 8 AUG 2024
- AEMO's Draft High Level Implementation Assessment V0.1 - 19 SEP 2024
- Final Determination - 12 DEC 2024 (TBC)

During high pricing periods, retailers must respond to an increase in accrued liabilities by providing cash deposits or increased credit support to AEMO. The additional amount of cover required by AEMO is a function of the credit support, number of unpaid days that have accrued and the distribution of high price events during those days.

Solution

In December 2023 Globird Energy submitted a rule change request to shorten the settlement cycle to 10 business days following the end of the billing week. This included proposing to bring forward the posting of preliminary statement to 3 business days, and final statement to 8 business days. Following this rule change request and stakeholder consultation, the AEMC have made a draft determination to amend the NER to shorten the NEM settlement from 20 business days following the end of a billing period, to 11 business days.

Key benefits

Shortening the settlement cycle (SSC) rule change decreases the time over which participants are required to provide credit support. This would result in a reduction in the quantum of credit support provided by participants and the forward settling of bilateral derivative contracts. Lowering these working capital requirements may support increased investment in service innovation, lower barriers to retail electricity market entry, and reduce the risk of retailer failure. This in turn provides benefits for consumers through access to better service offerings, more choice, and more competitive pressure on retail prices.

[38] Each market participant's credit support is based on its typical daily accrual adjusted for volatility, established in accordance with the credit limit procedures (CLP).

Changes proposed

The SSC draft rule has three major implementation components:

- Establish metering and settlement processes that supports a new, shorter settlement cycle.
- Adapt the credit limit procedures and supporting process to reflect the shorter settlement cycle.
- Transition metering, settlement and prudential processes from the current settlement cycle to the shorter settlement cycle

AEMO included in the Draft HLIA and in its submission to the Draft Determination an alternative settlement cycle which reduces the settlement cycle from 20 to 9 business days, complemented by the introduction of an additional 4-week revision (R0). R0 serves as a new quick revision after Final settlement, that minimises the risk of special revisions and ensures participant financial position on 20 business days is on part with today's arrangements, without significant change to metering exception management processes. Feedback to the Draft Determination and HLIA indicates the majority of stakeholders support this alternative however, the final Rule is subject to the AEMC's final determination.

Market, Industry and AEMO impacts

Initial assessment of industry and AEMO impacts are stated below based AEMO's Draft HLIA.

Market & Industry Stakeholders

- FRMPs
- Metering Data Providers

AEMO Teams

- Operations (Settlements & Prudentials, Metering)
- Digital (Wholesale Solutions)

Next steps

- AEMC is expected to make a final determination by 12 December 2024.
- AEMO to publish final High Level Implementation Assessment post final determination.
- Indicative rule commencement in April 2026 based on the AEMC's draft determination.

Where can I find more information?

AEMC Rule Change Shortening the Settlement Cycle: https://www.aemc.gov.au/rule-changes/shortening-settlement-cycle

AEMO NEM Reform Program – Shortening the Settlement Cycle: https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/shortening-the-settlement-cycle

Interregional settlement residue arrangements for transmission loops

Ensuring appropriate market arrangements for the integration of Project EnergyConnect (PEC).

Problem to be solved

When implemented PEC will provide approximately 800 MW of transmission capacity between New South Wales and South Australia. This presents new challenges for market integration into the NEM with the creation of a physical transmission loop between adjacent regions. The occurrence of loop flows around the transmission loop has the potential to give rise to the 'spring washer' pricing effect[39], resulting in increased counter-price flows and negative interregional settlement residues. This will require changes to the allocation of negative interregional settlement residues and AEMO's negative residue management constraint clamping procedure.

Wholesale Electricity Market Reforms

Key Dates

- Draft Determination - 12 DEC 2024 (TBC)
- AEMO's Draft High Level Implementation Assessment - TBC
- Final Determination – MAR 2025 (TBC)

Solution

In February 2024 AEMO submitted a rule change request to the AEMC proposing to change the methodology for the allocation of negative interregional settlement residues when the overall interregional settlement residues around the loop are positive (i.e., the loop is in surplus). This rule change request was submitted following stakeholder consultation and feedback captured in the PEC Market Integration Papers.[40] This would allow AEMO to update its negative residue management (or 'clamping') procedure to allow negative interregional settlement residue to accrue when the loop is in surplus, acknowledging the natural occurrence of counter-priced flow under loop topology. The AEMC published a Consultation Paper on 8 August 2024, requesting stakeholder feedback on a range of possible methodologies for the allocation of negative interregional settlement residues.

Key benefits

If AEMO does not impose clamping constraints when the loop is in surplus, there will be additional recovery of negative settlement residues from importing TNSPs as per the current allocation of negative interregional settlement residues. Changing the methodology for the allocation of negative interregional settlement residues in this scenario under loop topology seeks to better reflect the dynamics of power flows within a loop by spreading the allocation around the loop and acknowledging that increased positive interregional settlement residues are

[39] The 'spring washer effect' occurs when transmission constraints happen within a loop, causing pricing anomalies in this case between regions.

[40] AEMO, 2023, PEC Market Integration Papers - https://aemo.com.au/en/consultations/current-and-closed-consultations/project-energy-connect-market-integration-paper

enabled by the occurrence of counter priced flows. This will allow AEMO to update its clamping constraint process and maximise the value and efficiency of power flowing around the loop.

Changes proposed

The changes propose sit across two components:

- AEMO's constraint clamping procedure – update the constraint clamping process and procedure for counter priced flows that occur within the transmission loop. This will be completed by AEMO in 2025 and include formal stakeholder procedure consultation.
- Allocation of negative interregional settlement residue – NER amendments to the methodology for allocation of negative interregional settlement residue within the transmission loop when the overall loop is in surplus. This is currently under consultation by the AEMC.

Market, Industry and AEMO impacts

Initial assessment of industry and AEMO impacts will be included in AEMO's draft HLIA.

Next steps

- AEMC is expected to make a draft determination by 12 December 2024, followed by AEMO's draft HLIA.
- A Final determination from the AEMC is expected in March 2025.
- AEMO will commence consultation on negative residue management clamping procedure in Q1 2025.

Where can I find more information?

AEMC Interregional settlements residue for transmission loops: https://www.aemc.gov.au/rule-changes/inter-regional-settlements-residue-arrangements-transmission-loops

AEMO PEC Market Integration Papers: https://aemo.com.au/en/consultations/current-and-closed-consultations/project-energy-connect-market-integration-paper

AEMO NEM Reform Program – PEC Market Integration: AEMO | Project EnergyConnect – Market Integration project

ST PASA procedure and recall period

Providing more reliable and secure ST PASA information.

Wholesale Electricity Market Reforms

Key Dates

- Final Determination - 5 MAY 2022
- ST PASA Procedure Consultation - 2 SEP 2024
- Final High Level Implementation Assessment - 15 OCT 2024
- ST PASA Procedure published - 30 APR 2025
- Go-live - 31 JUL 2025

Problem to be solved

In June 2021, AEMO submitted a rule change request to the AEMC regarding the short-term projected assessment of system adequacy (ST PASA). AEMO raised issues with the existing framework for ST PASA in the NER, including its overly prescriptive nature which limits flexibility to make changes that may be beneficial to the market, inconsistency with what AEMO does in practice and the NER containing definitions that are no longer fit for purpose.

Solution

In May 2022, the AEMC made a final determination to amend the NER to introduce greater flexibility for ST PASA, revise some ST PASA definitions and obligations and require the commencement of the new ST PASA from 31 July 2025. In addition to the introduction of the principles-based framework for ST PASA, the final rule;

- specifies that AEMO must publish forecasts of available capacity of individual scheduled generating plant and wholesale demand response units. PASA availability for individual scheduled generating units (DUID), scheduled loads, scheduled network service providers and wholesale demand response units.
- ST PASA covers each 30-minute period (or such shorter period as determined by AEMO) in at least the seven trading days from and including the day of publication.
- makes changes to the definition of energy constraint and PASA availability, enabling AEMO and market participants to have greater visibility of the actual recall time of plant.
- obligates AEMO to develop and publish new ST PASA procedures by 30 April 2025, giving participants three months to comply with the procedures before the rule commences on 31 July 2025.

Key benefits

- Provides flexibility to the participants to communicate to the market on their unit availability and outage conditions.
- The first step towards AEMO's ability to assess reliability and security conditions in the NEM as the market develops.

Changes to be delivered

The table below summarises the changes proposed for ST PASA procedure and recall period, based on the Final HLIA.

Procedures & Guidelines	Market Applications	Market Interfaces
AEMO has commenced the development of the new ST PASA Procedures to incorporate the requirements of the new NER 3.7.3. The resulting material changes include: • Publication of available capacity for scheduled resources by DUID • Incorporation of capacity that can be made available on any notice period (shorter or longer than 24 hours) within the next seven days, which will necessitate a change in the input requirements for relevant scheduled resources. AEMO is also consulting on the consequential minor amendments to the Reliability Standard Implementation Guideline (RSIG), the Spot Market Operations Timetable and SO_OP_3705 Short Term Reserve Management.	Based on the Final HLIA, system impacts are low for both AEMO and market participants. • Reporting and Data Model - Extend existing Bidding Reports to accommodate the new attribute and they will feed into a corresponding field that will be added to the table BidOfferPeriod. A new Report STPASA_UNITAVAILABILITY will be published every 30-minutes. • Settlements, Billing & Payments - A new Bidding Period attribute for Participant submissions, for Energy Bids for Scheduled Resources. The attribute will be optional and a default value of 0 (zero) will be assumed where it is not provided. This will be interpreted as an immediate Recall. This will be affected for Bids to the NEM, FTP, API and Webbidding interface	• Potential for new technology and hardware that will be required to enable the bidirectional communication link with AEMO to provide telemetry and receive instruction signals • The solution will support both cloud-hosted (major Australian cloud providers) and physical infrastructure based non-NSP Participant Intervening Facilities (endpoints). • Protocols supported will be Secure ICCP (Inter-control Centre Communications Protocol), as well as the Secure DNP3.0 protocol (agreed with the industry participants through the Power System Data Communication Standard consultation) to establish this connection.

Further details on the changes proposed to procedures are available via AEMO's Consultation of ST PASA Procedure and related documents

Further details and to access the HILA, visit AEMO's ST PASA Procedure and Recall Period project page

Market, Industry and AEMO impacts

Market & Industry Stakeholders

- Generators (Scheduled and Semi-Scheduled)
- Integrated Resource Providers
- Market Network Service Providers

AEMO Teams

- Operations (Real Time Operations, Electricity Market Monitoring, Ops Planning)
- Digital (Wholesale Solutions, Service Centre)

Next steps

- ST PASA procedure and related documents consultation is currently underway for the new ST PASA Procedure to be published by 30 April 2025.
- Industry testing planned over May and June 2025.
- Rule commencement on 31 July 2025.

Where can I find more information?

AEMC Rule Updating Short Term PASA: https://www.aemc.gov.au/rule-changes/updating-short-term-pasa

AEMO NEM Reform Program – ST PASA Procedure and Recall Period: https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/st-pasa

Appendices

Program Relationships / Dependencies
ESB Post-2025 Program Pathway Overview
References

Program Relationships / Dependencies

AEMO, the RDC and wider participant cohort continue to collaborate on managing the implementation risks and challenges associated with delivering the breadth of initiatives across the Program including identifying opportunities to bundle and sequence where possible. The table below provides an example of the potential bundling and sequencing opportunities under consideration in development of the Roadmap and delivery of the Program. Further assessment is to be completed, particularly in relation to the delivery of AEMO strategic and foundational initiatives (IDAM, IDX and PC) and how bundling and/or sequencing these initiatives may drive wider efficiencies across the Program.

Initiatives	Timing	Functional Overlap	Rationale	Next Steps
Unlocking CER benefits through flexible trading & Integrating price responsive resources into the NEM	Aligned	Medium	• Unlocking CER benefits through flexible trading enables the management of controllable resources through a second connection point. The framework developed for flexible trading arrangements to support the management of controllable resources will be used by the Integrating price responsive resources into the NEM initiative • Opportunities to bundle through a consolidated procedure consultation process of both initiatives if timing permits	• Sequencing opportunity reflected in the Roadmap • Bundling opportunity to be monitored
SCADA Lite & Integrating price responsive resources into the NEM	Aligned	Medium	• SCADA Lite will provide a platform for participants, such as VPPs, to communicate with AEMO and provide visibility of their DER device activities a component of the Integrating price responsive resources into the NEM initiative	• Sequencing opportunity reflected in the Roadmap
Enhancing Reserve Information & ST PASA Procedure and Recall Period	Aligned	Strong	• Opportunities to bundle by consolidating industry test windows, Tech specs and Data Model releases	• Opportunity to be monitored
Enhancing Reserve Information & IDX Transition	Potential alignment	Low	• IDX Transition could enable faster release of reporting data to participants alongside Dispatch	• Further assessment to be completed during planning phase subject to IDX consultation with industry
Metering Services Review & IDX Foundation	Potential alignment	Medium	• Accelerated smart meter deployment PQ data could utilise IDX Foundation capability to enable PQ data to be delivered on a strategic platform, meaning data able to be provided more frequently and with less impact on existing market transactional systems	• Further assessment to be completed during planning phase subject to final rules determination, IDX consultation with industry
DER Data Hub & Registry Services & IDX Foundation	TBC	Strong	• DER Data Hub & Registry Services will need to transact DER-related information between existing and new participants. IDX Foundation could provide the foundational capability to do this	• Further assessment to be completed subject to future industry trials, IDX consultation with industry
DER Data Hub & Registry Services & IDAM	TBC	Strong	• DER Data Hub & Registry Services may require management of the identities of parties who are not existing market	• Further assessment to be completed subject to future industry trials,

Initiatives	Timing	Functional Overlap	Rationale	Next Steps
			participants, and their relationships to DER assets. IDAM solution could support this.	IDAM consultation with industry
Dispatch Target State and IDX Transition (Wholesale)	TBC	Strong	• Bundling IDX Transition for Wholesale to future Dispatch Target State would likely result in efficiencies to delivery for participants (e.g., retailers and generators). However, it may increase the risk of delivery.	• Dispatch Target State on-hold subject to future checkpoints. Potential opportunities to be reassessed at a future point in time
FRC Target State & IDX Transition (Retail)	TBC	Strong	• Bundling IDX Transition for Retail to FRC target state could result in high efficiencies for retailers, distributors and metering providers due to almost full functional overlap from FRC target state	• FRC Target State on-hold subject to future checkpoints / assessment. Potential opportunities to be reassessed at a future point in time

References

Workstream	Reform Initiative	Reference (link to rule change, market review, or latest ESB publication)
Essential System Services	Frequency Performance Payments (FPP)	AEMC Rule Change: https://www.aemc.gov.au/rule-changes/primary-frequency-response-incentive-arrangements AEMO FPP Project: https://aemo.com.au/initiatives/major-programs/frequency-performance-payments-project AEMO FCFP Consultation: https://aemo.com.au/consultations/current-and-closed-consultations/frequency-contribution-factors-procedure AEMO PFR Requirements Consultation: https://aemo.com.au/consultations/current-and-closed-consultations/primary-frequency-response-requirements
	Enhancing Reserve Information (ERI)	AEMC Rule Change: https://www.aemc.gov.au/rule-changes/enhancing-reserve-information-formerly-operating-reserves AEMO ERI Project: https://aemo.com.au/en/initiatives/major-programs/nem-reform-program/enhancing-reserve-information-project
	Improving security frameworks for the energy transition (ISF)	AEMC Rule Change: https://www.aemc.gov.au/rule-changes/improving-security-frameworks-energy-transition AEMO ISF Project: https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/improving-security-frameworks-for-the-energy-transition
Transmission Access	Transmission Access Reform	ESB Transmission and Access: https://esb-post2025-market-design.aemc.gov.au/transmission-and-access AEMC Market Review - Transmission Access Reform: https://www.aemc.gov.au/market-reviews-advice/transmission-access-reform
DER & Flexible Demand	Unlocking Consumer Energy Resources (CER) benefits through flexible trading	AEMC Rule Change Unlocking CER benefits through flexible trading: https://www.aemc.gov.au/rule-changes/unlocking-CER-benefits-through-flexible-trading AEMO Unlocking CER benefits through flexible trading Project: https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/flexible-trading-arrangements
	Integrating price responsive resources into the NEM	AEMC Rule Change Consultation: https://www.aemc.gov.au/rule-changes/integrating-price-responsive-resources-nem AEMO IPRR Project: https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/integrating-price-responsive-resources-into-the-nem
	Dynamic Operating Envelops	DCCEEW National CER Roadmap July 2024: https://www.energy.gov.au/sites/default/files/2024-07/national-consumer-energy-resources-roadmap.pdf AER Final Export Limit Guidance note October 2024: https://www.aer.gov.au/system/files/2024-10/Export%20Limits%20Guidance%20Note.pdf Project EDGE final report, Chapter 4: https://aemo.com.au/-/media/files/initiatives/der/2023/project-edge-final-report.pdf?la=en
	Distribution Local Network Services	DCCEEW National CER Roadmap July 2024: https://www.energy.gov.au/sites/default/files/2024-07/national-consumer-energy-resources-roadmap.pdf AEMO, Mondo, AusNet Services. Project EDGE Final Report October 2023, Chapter 7: https://aemo.com.au/-/media/files/initiatives/der/2023/project-edge-final-report.pdf?la=en

Workstream	Reform Initiative	Reference (link to rule change, market review, or latest ESB publication)
		AEMO Mondo, AusNet Services. Project Edge: https://aemo.com.au/en/initiatives/major-programs/nem-distributed-energy-resources-der-program/der-demonstrations/project-edge
	DER Data Hub and Registry Services	DCCEEW National CER Roadmap July 2024: https://www.energy.gov.au/sites/default/files/2024-07/national-consumer-energy-resources-roadmap.pdf CER Data Exchange Industry Co-Design: AEMO | CER Data Exchange Industry Co-Design AEMO, Mondo, AusNet Services. Project EDGE Final Report October 2023: https://aemo.com.au/-/media/files/initiatives/der/2023/project-edge-final-report.pdf?la=en AEMO, Mondo, AusNet Services. Project Edge – DER Data Hub Lessons Learnt: https://aemo.com.au/-/media/files/initiatives/der/2023/project-edge-der-data-hub-lessons-learnt-final-june-2023.pdf?la=en
	DER Operational Tools	DCCEEW National CER Roadmap July 2024: https://www.energy.gov.au/sites/default/files/2024-07/national-consumer-energy-resources-roadmap.pdf AEMO Operations Technology Roadmap: https://aemo.com.au/en/initiatives/major-programs/operations-technology-program/operations-technology-roadmap
Data Strategy	Data Services	ESB National Energy Laws Amendment (Data Access) Bill 2023: https://www.datocms-assets.com/32572/1681166642-esb-data-strategy-initial-reforms-draft-bill-april-2023.pdf ESB Data Services Policy Position Paper: https://www.datocms-assets.com/32572/1688102997-esb-data-strategy-initial-reforms-policy-positions.pdf
	Electric Vehicle Data	AEMO Electric Vehicle Supply Equipment – Rule change retraction: AEMO - Retraction EVSE Standing Data Rule Change Request.pdf (aemc.gov.au) DCCEEW National CER Roadmap July 2024: https://www.energy.gov.au/sites/default/files/2024-07/national-consumer-energy-resources-roadmap.pdf ESB Electric Vehicle Supply Equipment Standing Data – Consultation Outcomes Report June 2023: https://www.datocms-assets.com/32572/1688103470-attachment-b-evse-standing-data-consultation-paper-final-june-2023.pdf
	Bill Transparency	AEMC Market Review – Billing Data Transparency: https://www.aemc.gov.au/market-reviews-advice/billing-data-transparency ESB Bill Transparency Consultation Paper (July 2023): https://www.datocms-assets.com/32572/1688619055-esb-billing-transparency-consultation-paper-final-july-2023.pdf
	Network Visibility	AER Review – Network Visibility: https://www.aer.gov.au/industry/registers/resources/reviews/network-visibility ESB Network Visibility Consultation Paper (July 2023): https://www.datocms-assets.com/32572/1688618798-esb-network-visibility-consultation-paper-final-july-2023.pdf
AEMO Foundational & Strategic	Identity and access management	AEMO Market Interface Technology Enhancements Working Group: https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/market-interface-technology-enhancements AEMO Final Business Case Package (IDAM, IDX and PC) July 2024: F&S Business Case
	Industry Data Exchange	As above.

Workstream	Reform Initiative	Reference (link to rule change, market review, or latest ESB publication)
	Portal Consolidation	As above.
	SCADA Lite	AEMO SCADA Lite Project: https://aemo.com.au/initiatives/trials-and-initiatives/scada-lite
	FRC Target State	To be developed.
Retail Electricity Market Improvements	Metering Services Review (Accelerating Smart Meter Deployment)	AEMC Rule Change Accelerating smart meter deployment: https://www.aemc.gov.au/rule-changes/accelerating-smart-meter-deployment AEMO Metering Services Review (Accelerating Smart Meter Deployment) Project: https://aemo.com.au/en/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/metering-services-review---accelerating-smart-meter-deployment
Wholesale Electricity Market Reforms	Shortening the Settlement Cycle	AEMC Rule Change Shortening the Settlement Cycle: https://www.aemc.gov.au/rule-changes/shortening-settlement-cycle AEMO NEM Reform Program – Shortening the Settlement Cycle Project: https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/shortening-the-settlement-cycle
	Interregional settlements residue for transmission loops	AEMC Interregional settlements residue for transmission loops: https://www.aemc.gov.au/rule-changes/inter-regional-settlements-residue-arrangements-transmission-loops AEMO PEC Market Integration Papers: https://aemo.com.au/en/consultations/current-and-closed-consultations/project-energy-connect-market-integration-paper AEMO NEM Reform Program – PEC Market Integration Project: AEMO | Project EnergyConnect – Market Integration project
	ST PASA Procedure and Recall Period	AEMC Rule Updating Short Term PASA: https://www.aemc.gov.au/rule-changes/updating-short-term-pasa AEMO ST PASA Procedure and Recall Period Project: https://aemo.com.au/initiatives/major-programs/nem-reform-program/nem-reform-program-initiatives/st-pasa