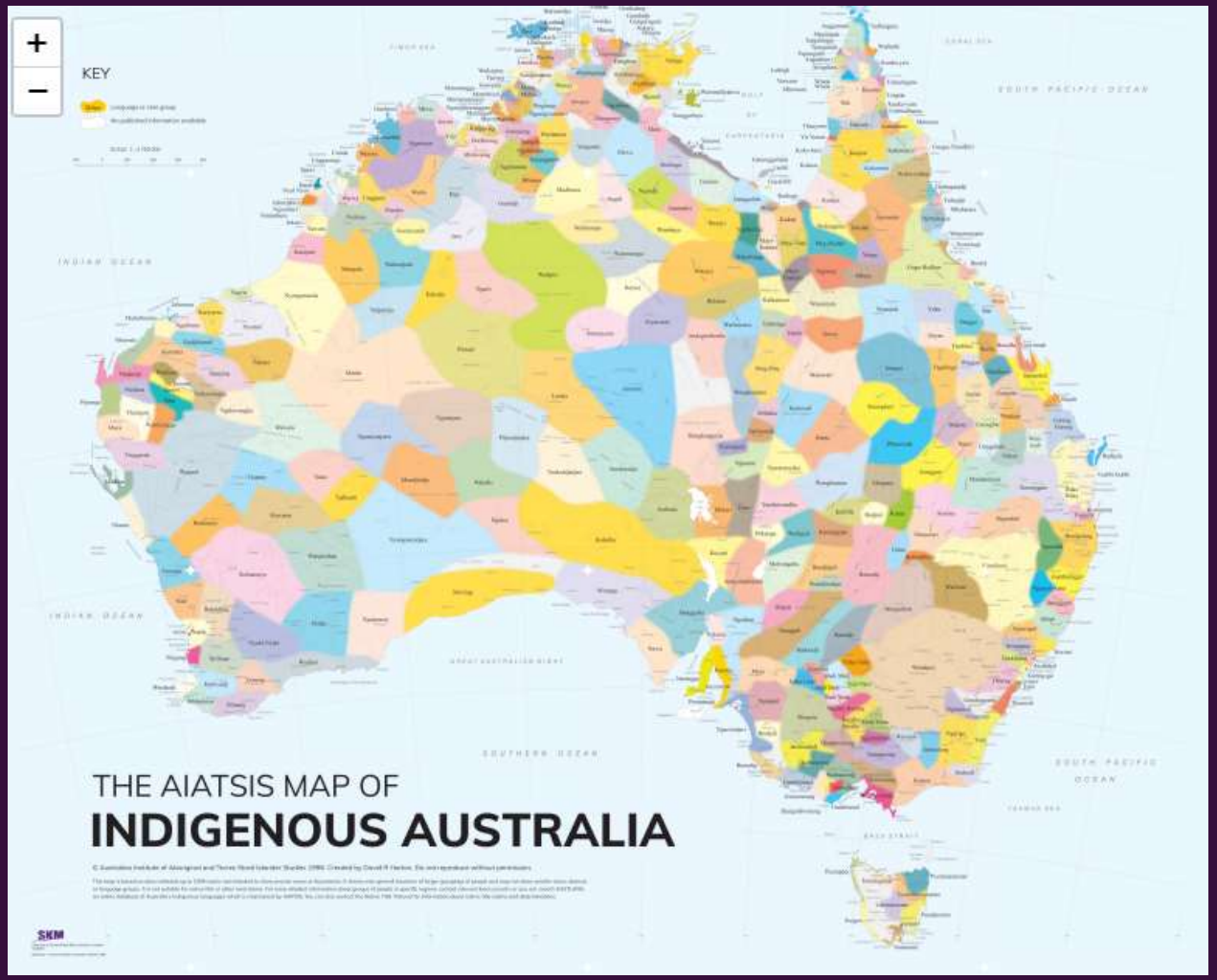
AEMO Consumer Forum

6 October 2021

Acknowledgement of Country



Housekeeping

1. Please use the Chat function for questions or comments during presentations.
2. We will be recording.
3. If you have dialled in via phone, please email your name and organisation to stakeholderrelations@aemo.com.au for our records.
4. We have emailed the slide deck around. If you didn't receive it, email stakeholderrelations@aemo.com.au and we'll forward it on.

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Agenda

Time	Duration	Item	Speakers
10:00am	5 minutes	Welcome and overview	
10:05am	30 minutes	Inputs, Assumptions and Scenarios Report (IASR)	ISP Consumer Panel
10:35am	30 minutes	Electricity Statement of Opportunities – consumer perspectives	Ben Jones
11:05am	15 minutes	Customer Switching	Lee Brown
11:15am	15 minutes	5 Minute Settlement (5MS) Program update	Anne-Marie McCague
11:30am	5 minutes	Break	
11:35am	25 minutes	Schedule Lite	Trent Morrow
12:00pm	10 minutes	Connections Reform Initiative	Alicia Webb
12:10am	15 minutes	Update on other AEMO activities	Marteena McKenzie
12:25am	5 minutes	Other business & close	

ISP Inputs Assumptions & Scenarios Report

ISP Consumer Panel

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ISP Consumer Panel Update – Inputs Assumptions and Scenarios

ISP Consumer Panel

30th September 2021

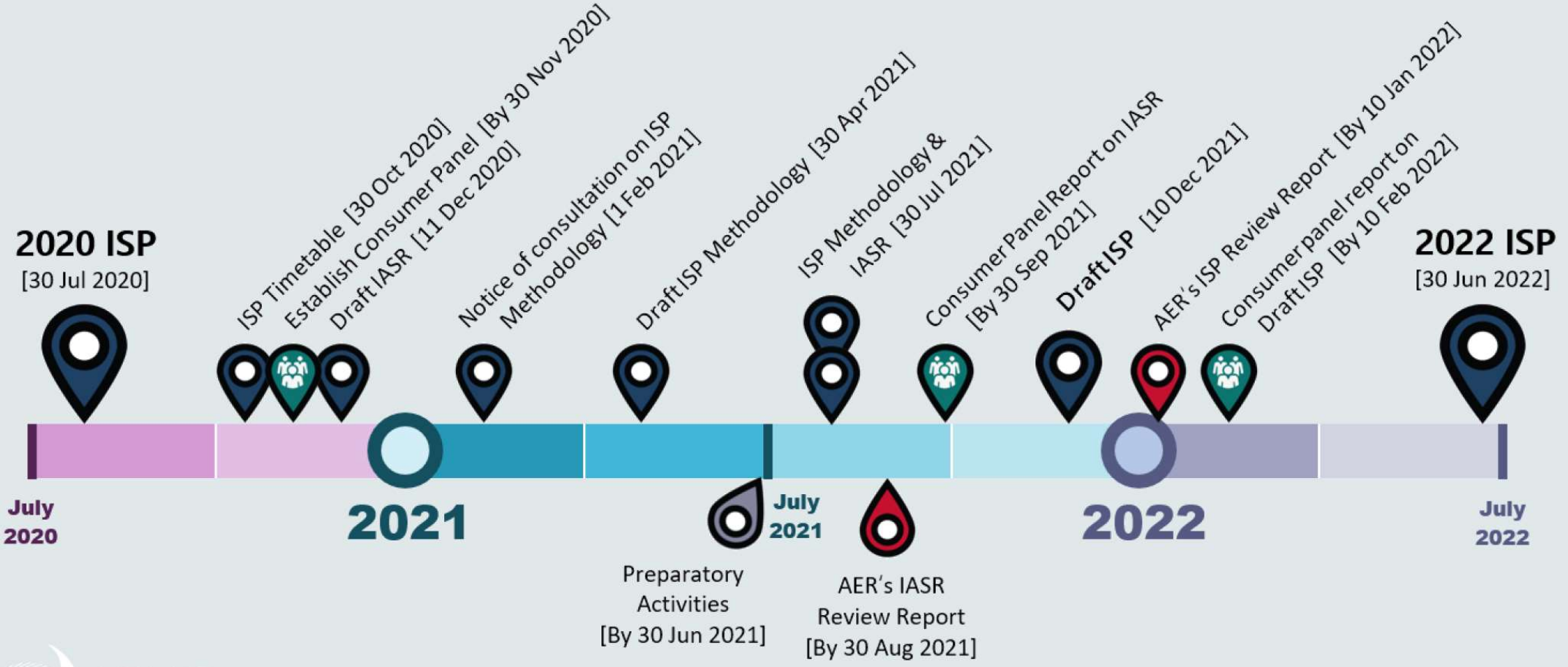
About Us

- ISP Consumer Panel established in November 2020 under the NER, part of the ISP Oversight Framework
- We promote the consumer interest are not a substitute for consumers' engagement with the ISP
- We have two main reports to write and maintain a focus on both process AND content
- In terms of content, we maintain a dual focus on managing uncertainty as well as improving the accuracy of forecasts
- AEMO published the Inputs, Assumptions and Scenarios Report (IASR) on 31 July and we published our report on 30 September 2021

2022 ISP Progress

Figure 2 Parallel ISP consultations

2022 ISP timeline



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The NEM in 2040: a snapshot

	Slow Change	Steady Progress	Net Zero 2050	Step Change	Hydrogen Superpower
DEMAND					
Electrification					
– % of road transport that is EV by 2040	22%	44%	52%	58%	76%
– % of residential EVs still relying on convenience charging by 2040	68%	61%	57%	47%	40%
– Industrial electrification by 2040	-25 TWh	8 TWh	32 TWh	45 TWh	66 TWh
– Residential electrification by 2040	0 TWh	0 TWh	6 TWh	9 TWh	10 TWh
Energy efficiency savings by 2040	16 TWh	25 TWh	30 TWh	44 TWh	44 TWh
Underlying Consumption					
– NEM underlying consumption by 2040	184 TWh	245 TWh	276 TWh	279 TWh	329 TWh
– H2 consumption (domestic), 2040	0 TWh	0 TWh	2 TWh	15 TWh	64 TWh
– H2 consumption (export), including green steel, 2040	0 TWh	0 TWh	0 TWh	0 TWh	221 TWh
– Total underlying consumption by 2040	**184 TWh**	**245 TWh**	**278 TWh**	**294 TWh**	**614 TWh**
SUPPLY					
Distributed PV Generation	47 TWh	51 TWh	61 TWh	66 TWh	83 TWh
% of household daily consumption potential stored in batteries	4%	12%	17%	32%	35%
% of underlying consumption met by DER by 2040 *	26%	21%	22%	22%	13%
Estimate of % coal in generation mix by 2040 *	50%	20-25%	15-20%	5%	0%
Estimate of NEM emissions production by 2040 (MT CO2-e)	TBD	TBD	55 (~40% of 2020 NEM emissions)	10 (~7% of 2020 NEM emissions)	1 (~1% of 2020 NEM emissions)

Level of change

* Estimates will be refined through ISP modelling

4 Strategic Recommendations

- A: Further expand AEMO's Stakeholder Engagement **Capability**
- B: Focus efforts on the inputs and assumptions that are most **material** to the consumer interest and have the most uncertainty
- C: Elevate the status of the **scenario** work, engage on it earlier and more widely and separate it from the ongoing forecasting and modelling work
- D: Following the IASR, focus engagement on how **uncertainty** is managed prior to publishing the Draft and Final 2022 ISP

A: Engagement Capability

"Electrification of everything" requires a pivot to **more outreach** to improve forecasts and manage uncertainty. Recommendations

1. Allocate adequate **resources** to build AEMO's capacity for engagement
2. Establish an **evaluation** framework for engagement
3. Establish KPIs for engagement and **accountability** within AEMO
4. Develop a more comprehensive and tailored stakeholder engagement plan for the 2024 ISP. Undertake a stakeholder mapping exercise to identify relevant stakeholders and how to best engage with them
5. Develop and maintain a **stakeholder management system** to regularly assess stakeholder needs and interests and identify gaps in stakeholder representation and participation
6. Formalise internal and external inter-relationships to **share knowledge** across consultations
7. Adopt a collaborative and **co-design** approach to engagement
8. Implement a program of **social research** to better understand consumer and community attitudes and perceptions about the future energy market

B: Materiality

- Draw attention to the inputs and assumptions that are most material to the consumer interest and have the most uncertainty
- Manage the complexity and volume of information to foster wider engagement
- Adopt alternative or additional ways of forecasting and engaging on these material, but highly uncertain, inputs and assumptions for the 2024 ISP.
  - State, Territory and National government policies.
  - gas prices
  - transmission costs
  - discount rates
  - decarbonisation and electrification of other sectors
  - hydrogen
  - Integration of distribution network forecasts

C: Elevate the Scenarios Work

Elevate the status of the scenario work, engage on it earlier and more widely and separate it from the ongoing forecasting and modelling work.

- **Recommendations**:
  - Engage early on scenarios for the 2024 ISP and use this process as an entry point for a wider group of stakeholders.
  - AEMO should also appoint the next Consumer Panel before the scenario development process commences.

D: Engagement prior to Draft ISP

Following the IASR, focus engagement on how **uncertainty** is managed prior to publishing the Draft and Final 2022 ISP

- **Recommendation**: We acknowledge that **government policies** are always subject to change, but encourage governments to work closely with AEMO and provide as much detail as possible before draft ISP. AEMO should consult on how to incorporate any material changes in government policies that occur between the IASR and final ISP.
- **Recommendation**: Keep the Panel and other stakeholders appraised of **themes emerging** from results as the modelling unfolds and sensitivities are tested in order to build confidence that material uncertainties are being captured, especially noting the consultation on the Draft ISP will be over the New Year break.
- **Recommendation**: The **weightings** applied to scenarios is shaping up as a material piece of 'judgment' to be exercised before the Draft ISP is published. We are pleased that AEMO has adopted the recommendation made in submissions from the Consumer Panel and other stakeholders that the **Delphi** panel should contain representatives of consumers. AEMO should continue to engage with stakeholders including the Consumer Panel prior to the draft ISP on how it will conduct the Delphi panel process.
- **Recommendation**: The IASR and ISP Methodology do not set out the full list of proposed **sensitivities** or 'event-driven scenarios'. The choice of these sensitivities and scenarios and how they are used may have a material impact on the draft and final ISP. AEMO should engage with stakeholders including the Consumer Panel on these issues prior to the draft ISP.

Comments, Questions … ?

Thank you!

CONFIDENTIAL – EMBARGOED UNTIL ESOO RELEASE

2021 Electricity Statement of Opportunities

Ben Jones

Focus for the 2021 ESOO

The ESOO forecasts reliability in the NEM over a 10-year period.

The 2021 ESOO compares forecast USE to the interim reliability measure (IRM) of 0.0006% until 2024-25 the reliability standard of 0.002% thereafter

A key focus of this year's ESOO is on managing an accelerated transition towards high instantaneous penetration of renewable generation, thermal generation withdrawal, and 'green' hydrogen consumption.

Key insights

- No **forecast reliability gap is identified in any region** in the reliability forecast for the next 5 years. The development of 750 MW Kurri Kurri (and Tallawarra B once committed) are projected to close the T-3 reliability gap forecast in New South Wales last year.

- Absent additional investment, expected USE increases in the long-term due to deteriorating reliability and retirement of the coal generation fleet. Reliability standards are exceeded in **Victoria (by 2028-29)** and **New South Wales (by 2029-30)**.

- **Minimum operational demand is declining more rapidly than expected.** By 2025 (or earlier), minimum operational demand in mainland NEM is projected to fall below levels at which AEMO can operate the power system securely with its current operational toolkit.

- Development of renewable generation continues at pace. Based on existing, committed and anticipated projects and distributed PV forecasts, there will be **sufficient renewable resource potential to instantaneously supply 100% of NEM underlying demand** in some periods by 2025.

- A low, or zero, emissions electricity grid may support decarbonisation of transport, residential and industrial sectors through fuel switching to hydrogen, or electrification. This has potential to lead to **five-fold increases in NEM consumption by 2050**, and maximum demand becoming winter peaking in Victoria.

Definitions

1. **Unserved energy** (USE) is the amount of energy that cannot be supplied to consumers, resulting in involuntary load shedding (loss of consumer supply)
2. The **reliability standard** specifies that *expected* USE should not exceed **0.002%** of total energy consumption in any region *in any financial year*.
3. The **interim reliability measure (IRM)** specifies that *expected* USE should not exceed **0.0006%** of total energy consumption in any region *in any financial year*.
4. A material **forecast reliability gap** exists in a region for any financial year where forecast expected USE exceeds the reliability standard/IRM.
5. The **reliability gap size** represents the quantity of firm capacity or equivalent, expressed in MW, that is needed within the reliability gap period to maintain reliability at levels below the reliability standard/IRM.

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Reliability is within standard in all regions until 2027-28

- Reductions in maximum demand and energy consumption forecast
- Large amounts of new generation and storage capacity now committed
- Transmission projects including Project EnergyConnect further improve outlook
- Other risks still remain

Key points of interest…

…this summer

Reliability risks do not exceed the IRM in any region, but are higher in South Australia compared to last summer.

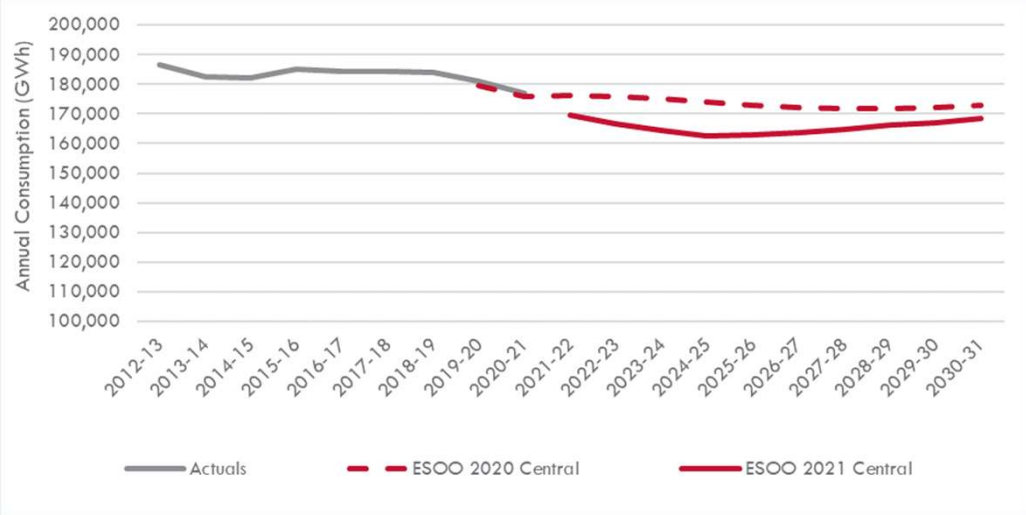
Features of note include:

- Peak demand and energy consumption is forecast to reduce for New South Wales and Queensland, driven by lower growth from business mass market, and in some regions, less industrial load growth.
- Large amounts of new generation capacity continues to connect, with an additional 2,245 MW of new capacity, including 470 MW of dispatchable battery storage capacity.
- Callide C Unit 4 in Queensland remains on extended outage after the operating incident in May 2021.
- Torrens Island B 1 in South Australia is now unavailable for the coming summer following the announced mothballing.

Demand forecasts have been revised downwards in the medium-term:

- Growth in the business mass market sector is forecast to recover in the later half of the outlook.
- Distributed PV continues to sustain rapid uptake.

NEM operational consumption, actual and forecast, 2012-13 to 2030-31, all ESOO scenarios



Regional summer (winter for Tasmania) actual and forecast 50% POE maximum operational demand (sent out)

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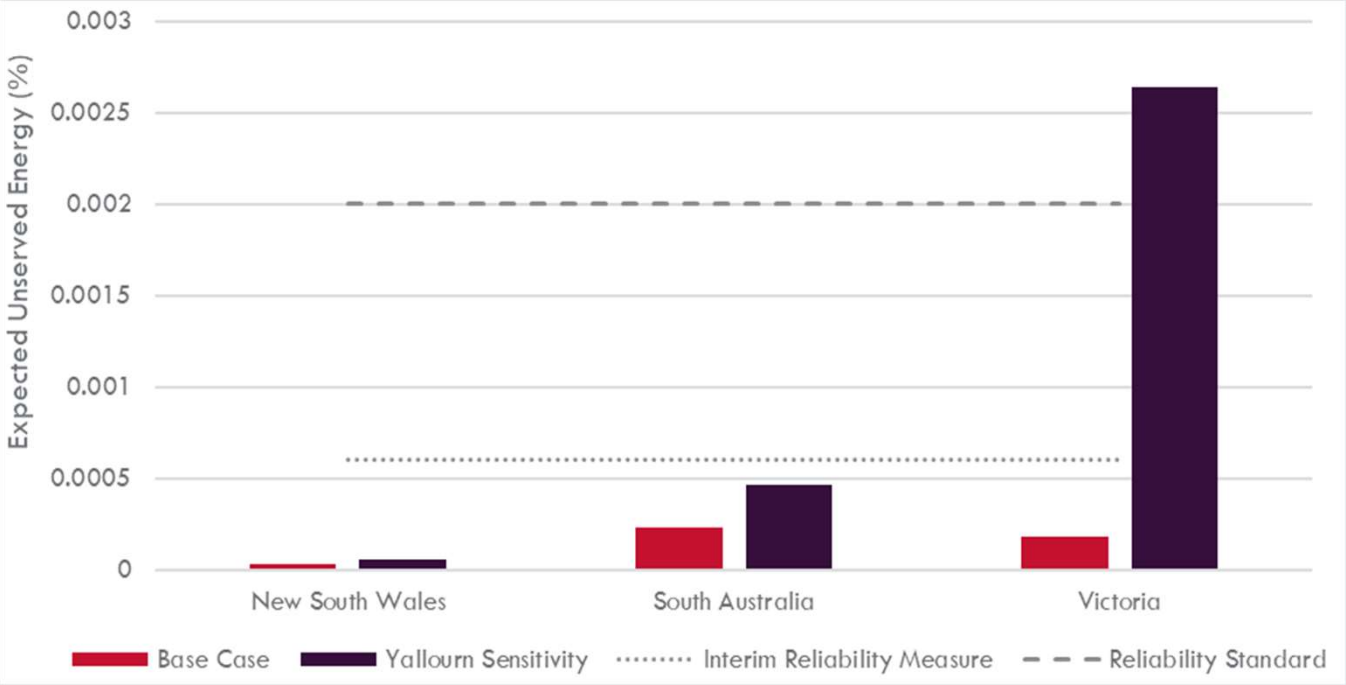
Risks of flooding at the Yallourn Power Station on USE this summer



While the likelihood of an event is relatively low, the risk of flooding in the Morwell River diversion could have significant consequences.

Other events that result in prolonged generation or transmission unavailability, could also present a risk this summer.

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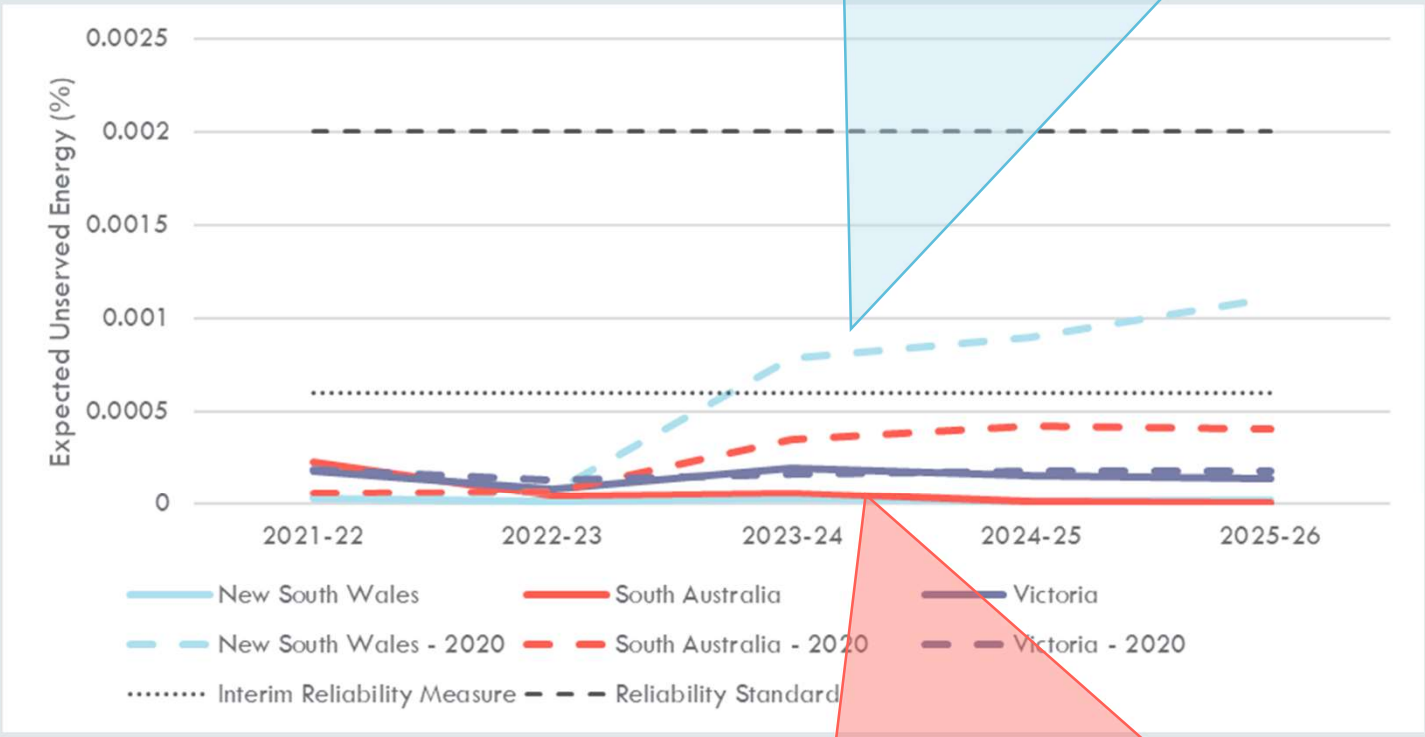
The Reliability Forecast (First 5 Years)

2024-25 is the "T-3" year.

In the 2020 ESOO, AEMO reported a reliability gap for New South Wales in 2023-24, which resulted in the Australian Energy Regulator (AER) creating a T-3 reliability instrument.

No reliability gap is forecast in the 2021 ESOO.

Forecast USE no longer increases following the retirement of Liddell Power Station partially due to the commitment of new generation capacity, including Kurri Kurri Power Station.



Forecast USE no longer increases following the retirement of Osborne Power Station partially due to the commitment of Project Energy Connect, Snapper Point and the reported return to service of Torrens Island B 1

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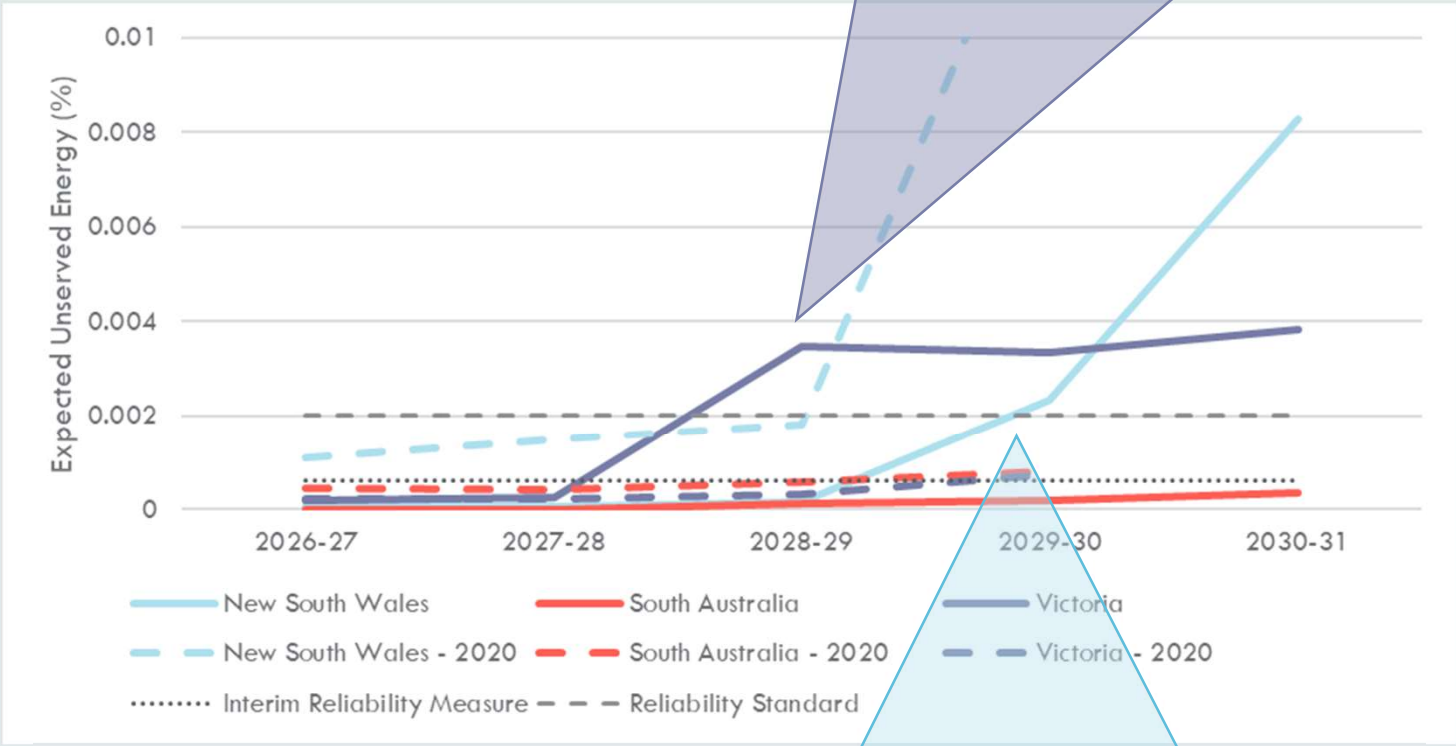
The Indicative Reliability Forecast (second 5 years)

There are generation, storage and transmission projects well progressed but not yet formally committed that will help maintain reliability below the reliability standard in all regions throughout this period.

Forecast USE now exceeds the reliability standard following the announced retirement of Yallourn Power Station



Newly committed generation and transmission projects have reduced the impact of the Vales Point Power Station retirement, however Eraring Power Station now begins to retire within the 10 year horizon.

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The energy transition is accelerating with increasing complexity.

- Proposed transmission to unlock Snowy 2.0 capacity can help mitigate risk of earlier than expected coal closures
- Minimum demand forecast to fall below identified security thresholds by 2025
- Hydrogen and electrification has the potential to reshape the power system

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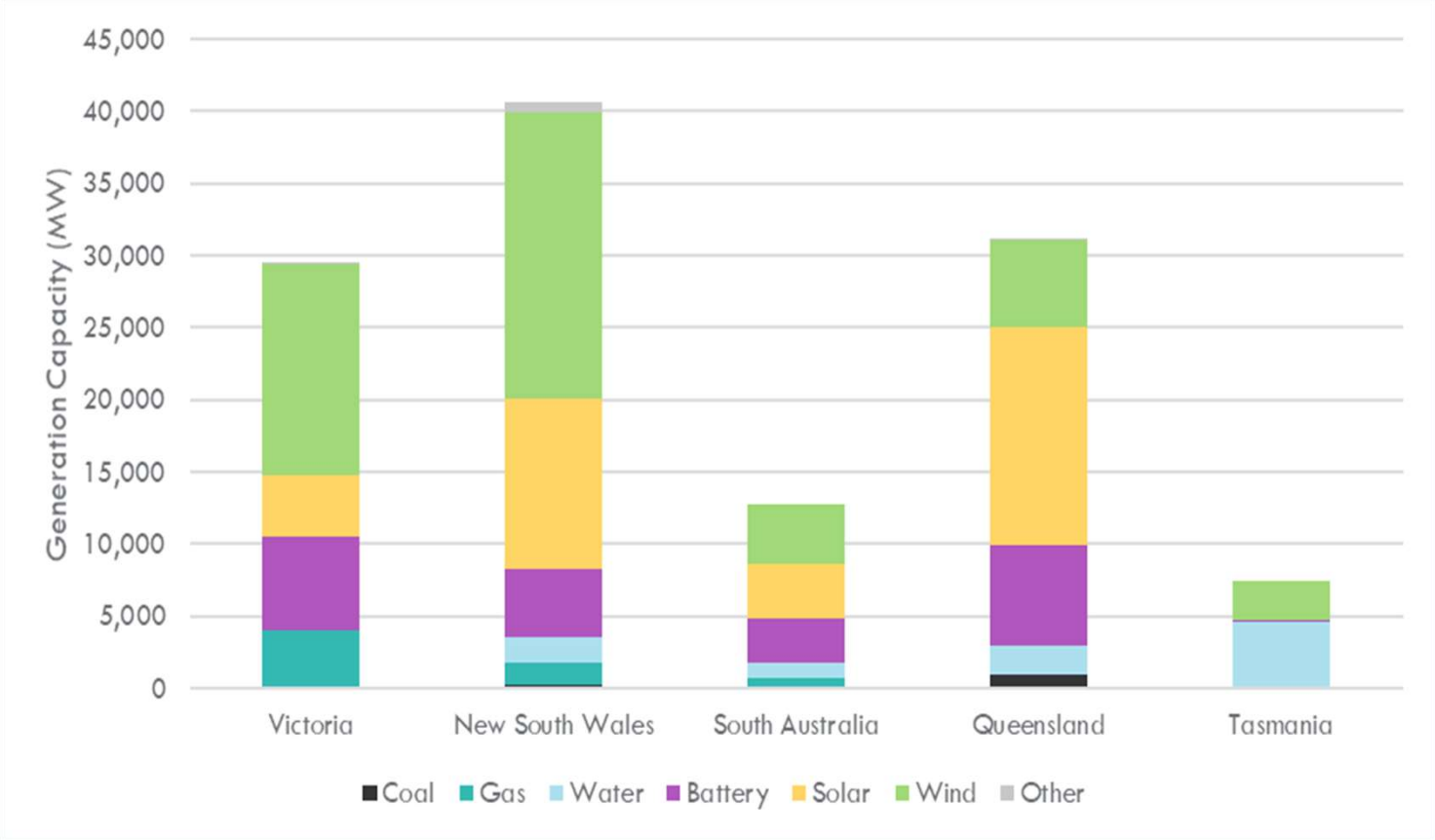
Reliability is forecast to exceed the reliability standard in some regions, primarily driven by coal retirements

Further thermal generators are expected to retire, potentially earlier than currently forecast

- The Central scenario is based on current best estimates of closure year, that are provided by industry participants
- The accelerated rate of change in the energy industry has implications for the ongoing financial viability of existing thermal generation.
- These conditions are highlighted by announcements since the 2020 ESOO that owners were bringing forward the closures of Yallourn Power Station, two units at Eraring Power Station and the near term mothballing of Torrens Island B 1.
- An ESOO sensitivity shows potential impact should retirements be brought forward just two years.
- The sensitivity shows need for 2,500 MW of new capacity in New South Wales to restore reliability below the reliability standard by 2030-31.

The pipeline of proposed projects now includes approximately 23GW of additional dispatchable capacity.

Proposed projects by type of generation and NEM region, beyond those already committed



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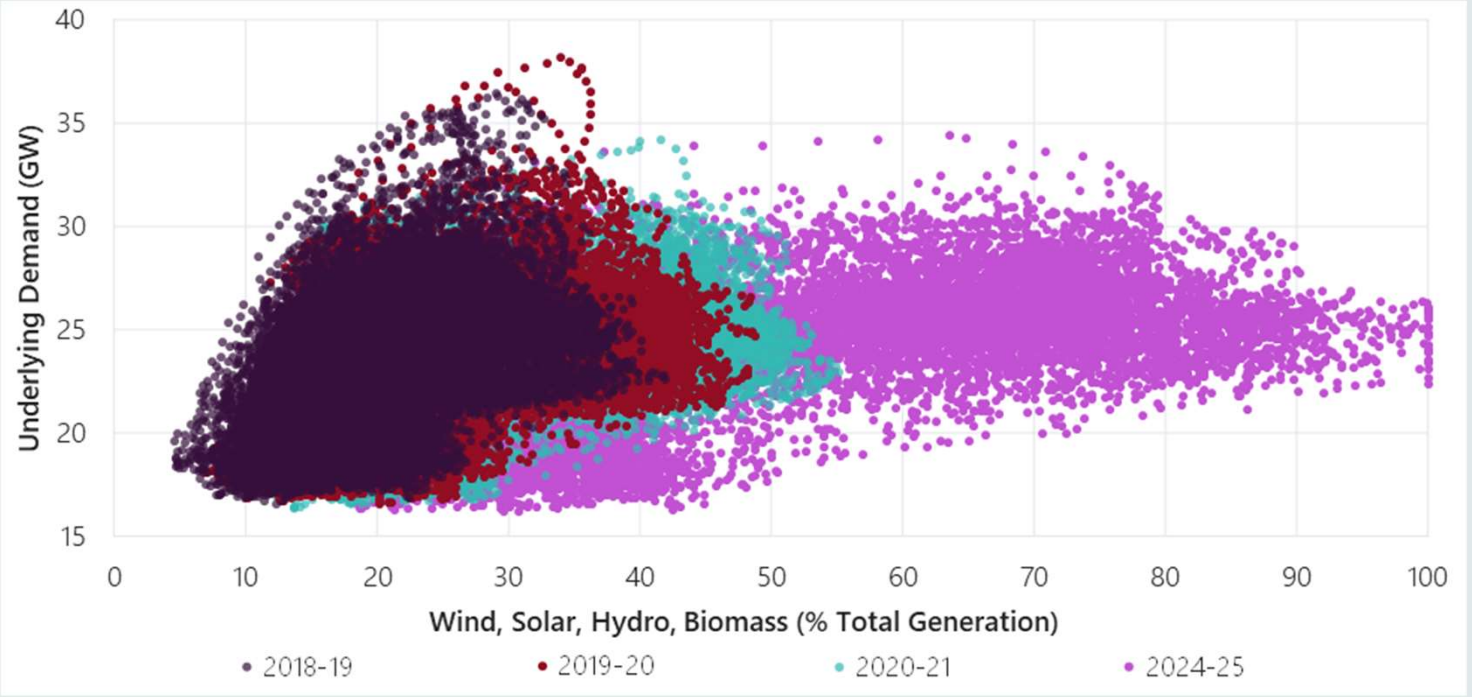
Resource potential from existing, committed and anticipated renewable energy projects

…100% instantaneous renewable penetration in some periods by 2025



AEMO has the goal to engineer the power system to be capable of operating securely through these periods of high instantaneous penetration

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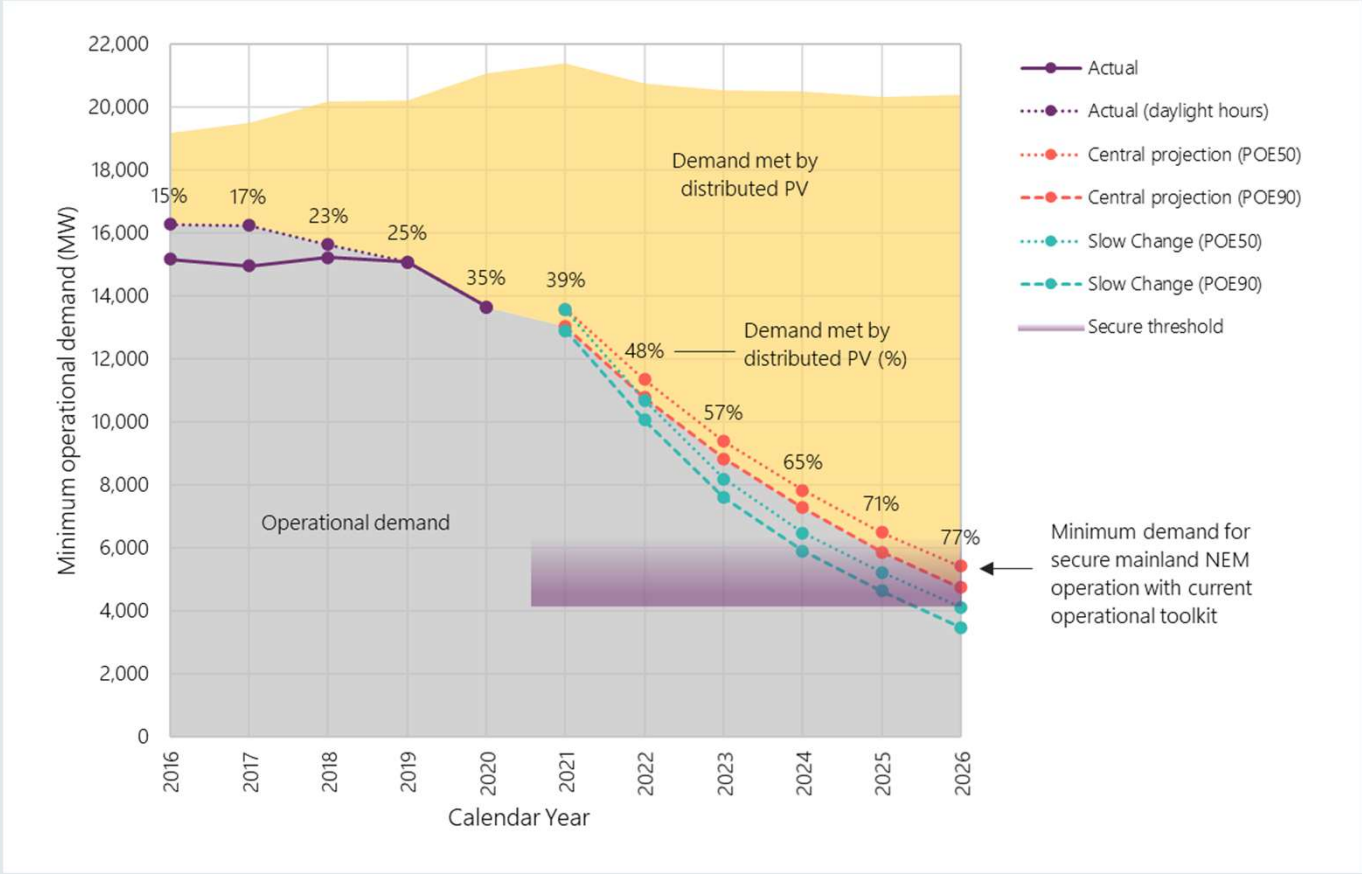
Challenges at time of minimum demand – rising distributed PV penetration

Minimum operational demand on the NEM mainland (excluding Tasmania)



- Distributed PV uptake exceeded expectations
- AEMO now forecasts an additional 6.5 GW of distributed PV capacity to be installed by 2025
- AEMO now forecasts earlier tipping points for secure operation of the NEM

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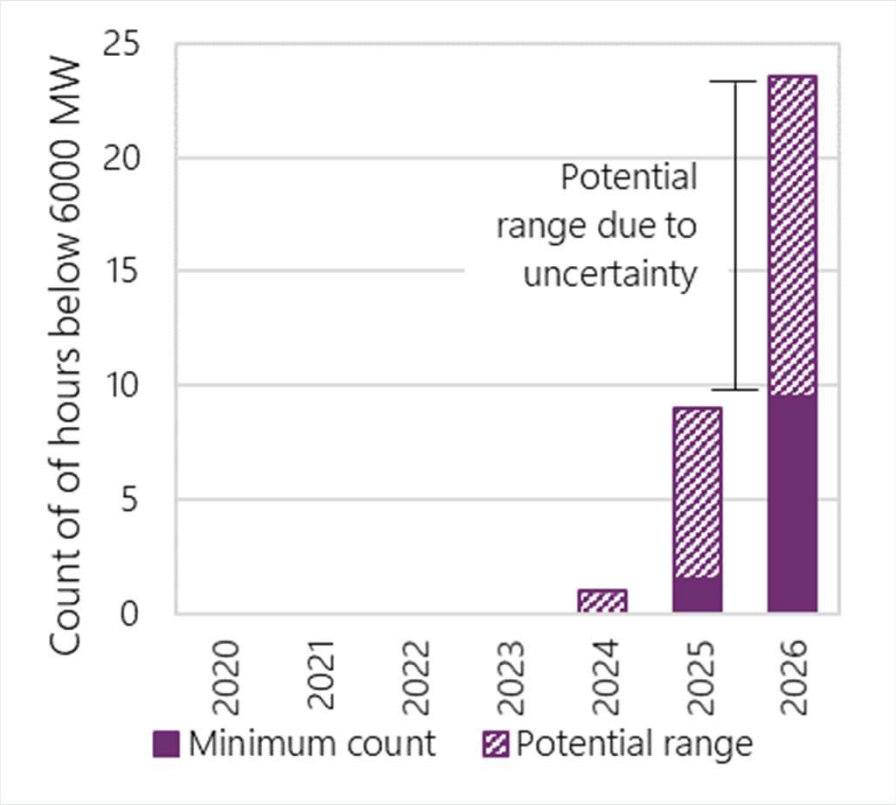
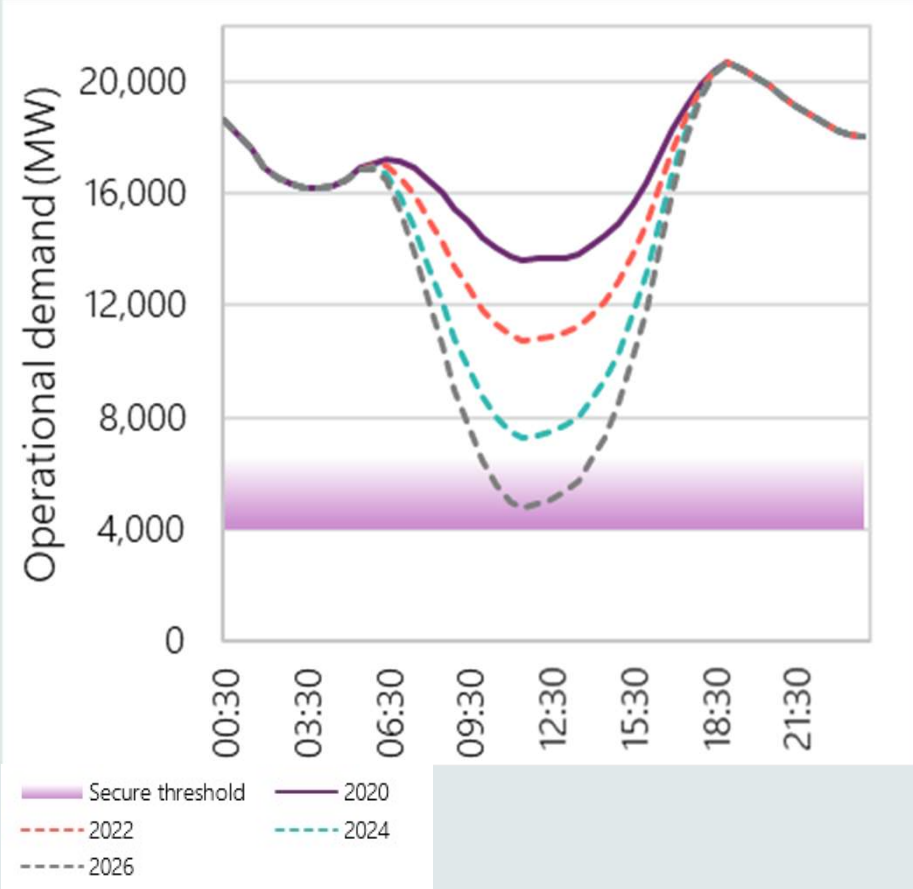
Forecast incidence and duration of operational demand below secure thresholds (NEM mainland)

Indicative range of operational demand below 6000MW across central scenario



Example minimum demand day, Central Projection POE90



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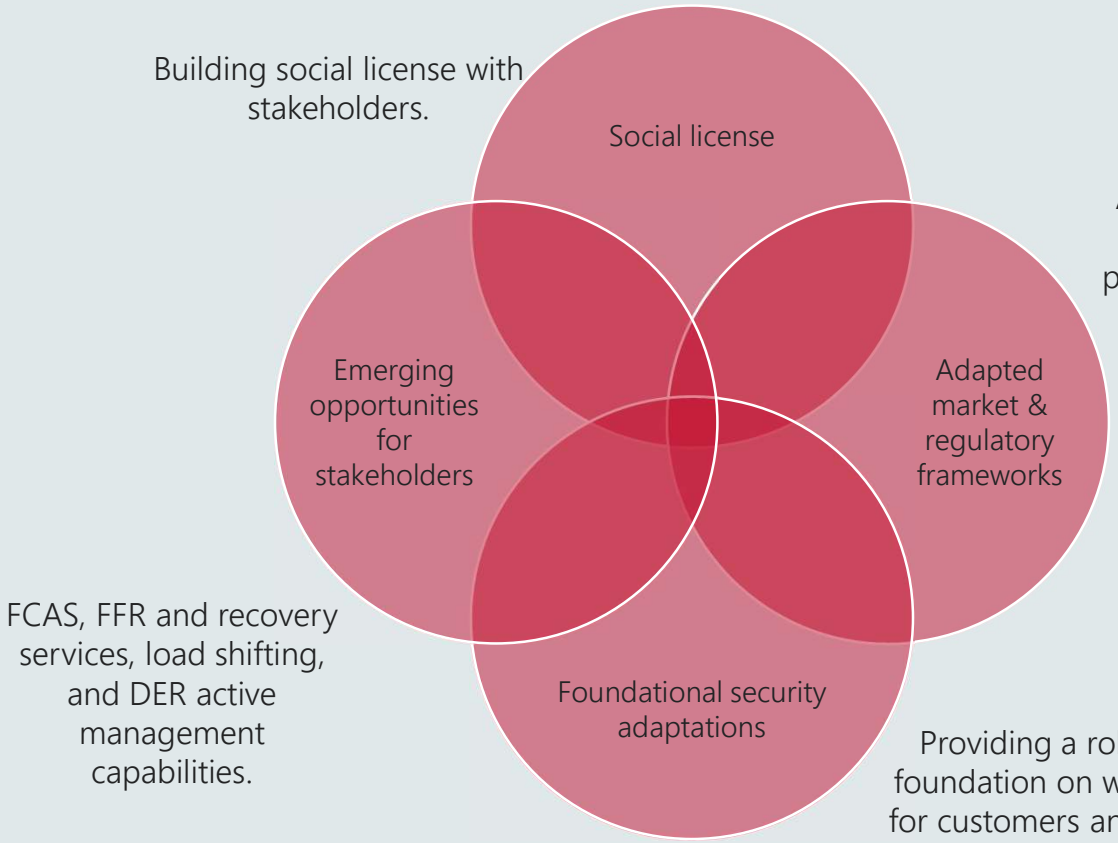
Facilitating secure operation at times of minimum system load

The transition to a power system supplied almost entirely by renewable and distributed resources in some periods represents a major change in power system and electricity market operation

Adaptations are required:



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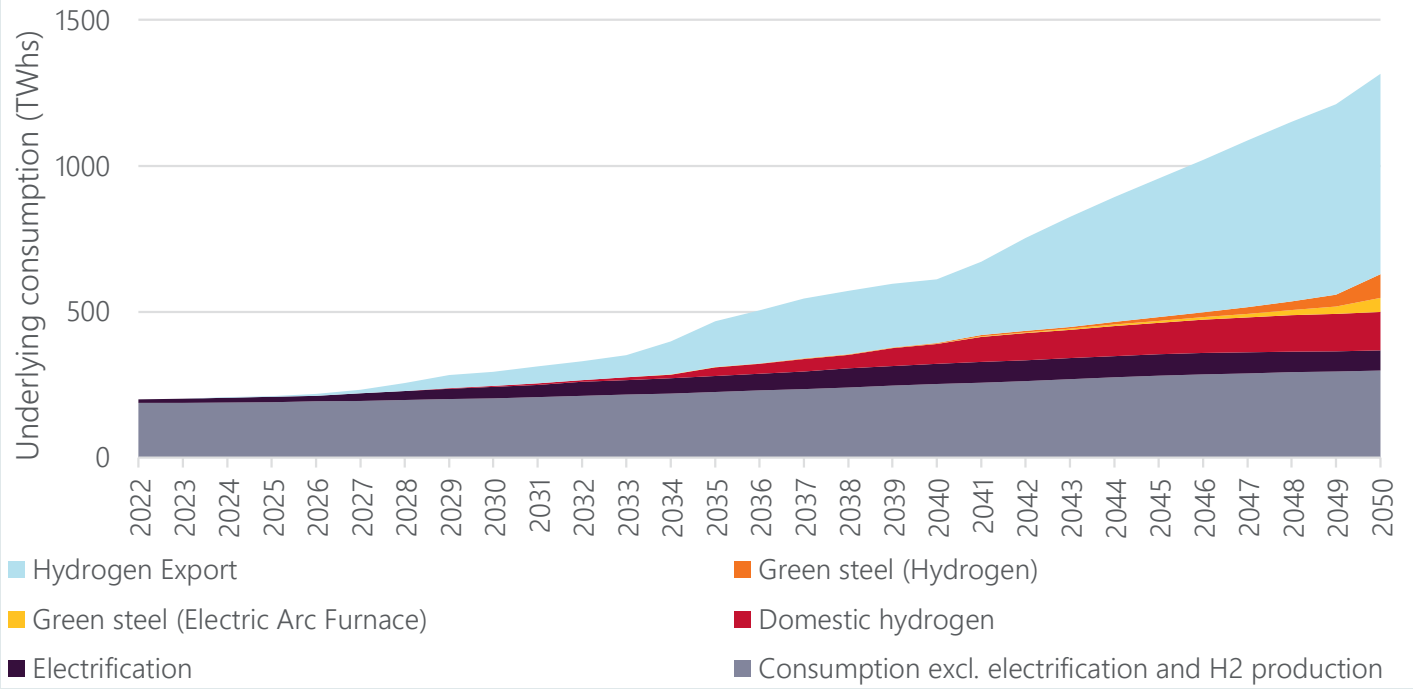
Hydrogen and electrification has the potential to grow consumption significantly, driven by the transport and industrial sectors.

- The scale of electrification could be very



Beyond the ESOO planning horizon, the potential growth due to electrification and hydrogen is forecast to be more significant, with the NEM consumption potentially doubling or even increasing five-fold by 2050 .

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Customer Switching in the NEM

Lee Brown

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Customer switching in the NEM

- Changes implemented on 1 October 2021 have modernised the customer switching processes in the NEM.
- AEMO developed and consulted on processes that will facilitate faster and more efficient switching, providing better outcomes for customers and electricity retailers.
- The new framework will reduce the time it takes customers to change electricity retailers, from months to a same-day transfer.
- Faster switching between energy retailers will make it easier for customers to transition to better electricity offers/rates and access new services and will provide retailers with a more streamlined process for switching in a new customer.

Customer switching timeline – non-smart meters

Old process

Switch will occur when the meter reader next visits and takes a meter reading

Up to Day + 65

The meter reader typically visits once every quarter to read the meter

Day 0

The retailer obtains explicit informed consent to switch the customer

New process

Switch can occur retrospectively on the date of the last meter reading

Day 0, or up to Day +65

The customer switch can occur on the same day that explicit informed consent is obtained or at an agreed date in the future (up to 65 business days)

Customer switching timeline - smart meters

Old process

Switch will occur when the cooling off period has ended

Day 12-14

Switch typically occurs after the 10 business day cooling off period has ended

Day 0

The retailer obtains explicit informed consent to switch the customer

New process

Option 1

Switch can occur retrospectively, up to 15 business days in the past, e.g. following the date of a recent bill.

Option 2

The customer switch can occur on day after explicit informed consent is obtained or at an agreed date in the future (up to 65 business days)

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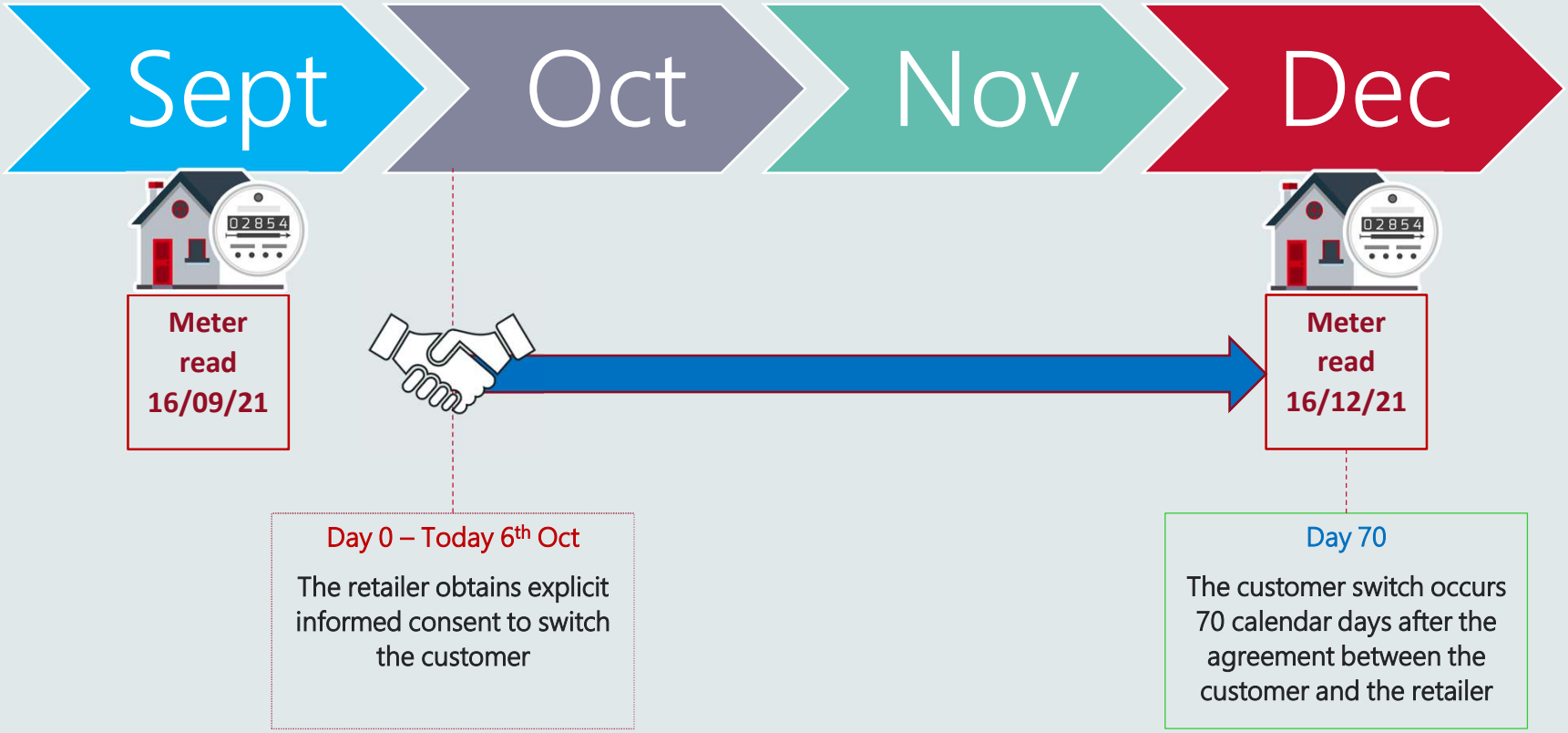
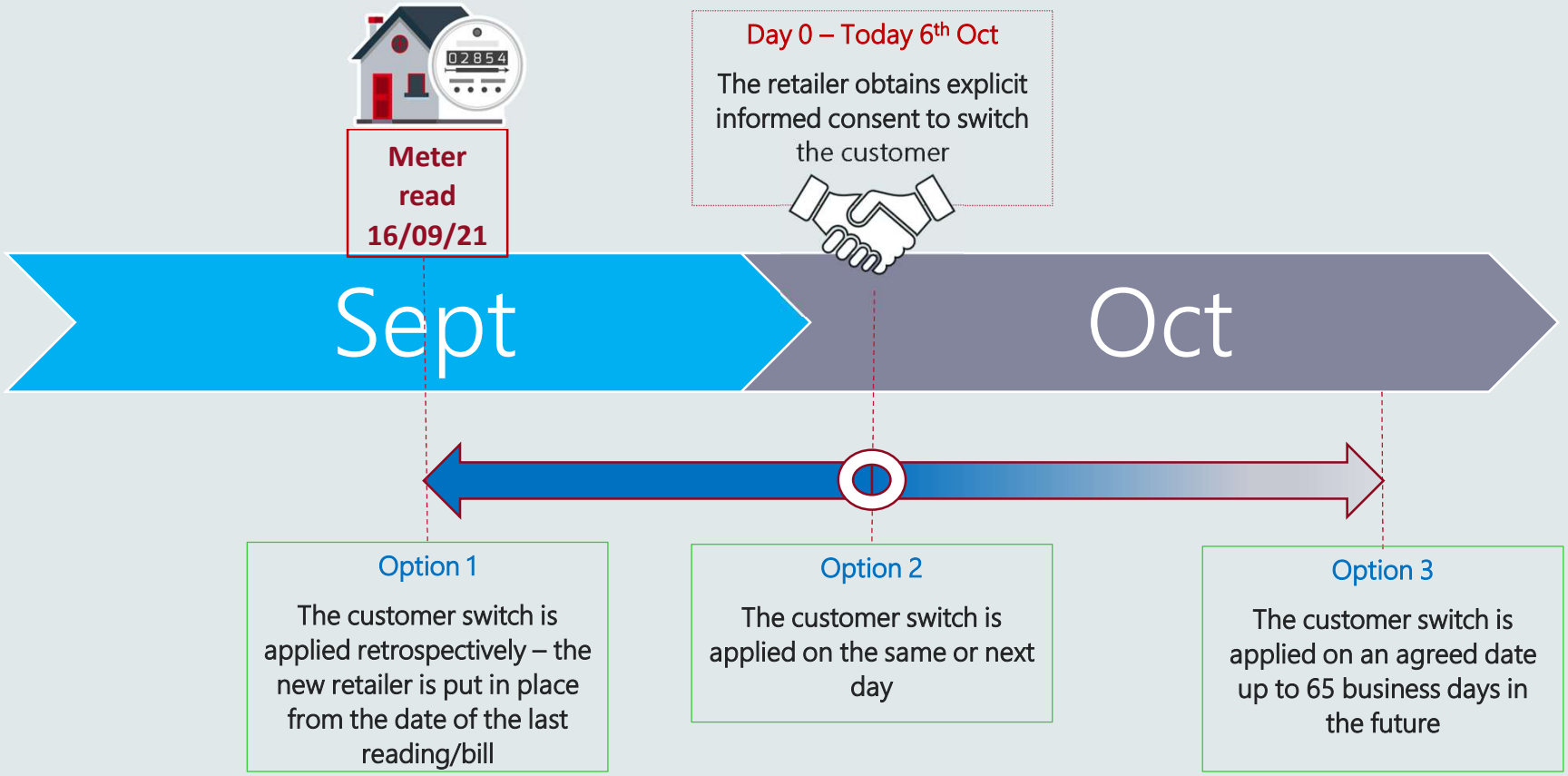
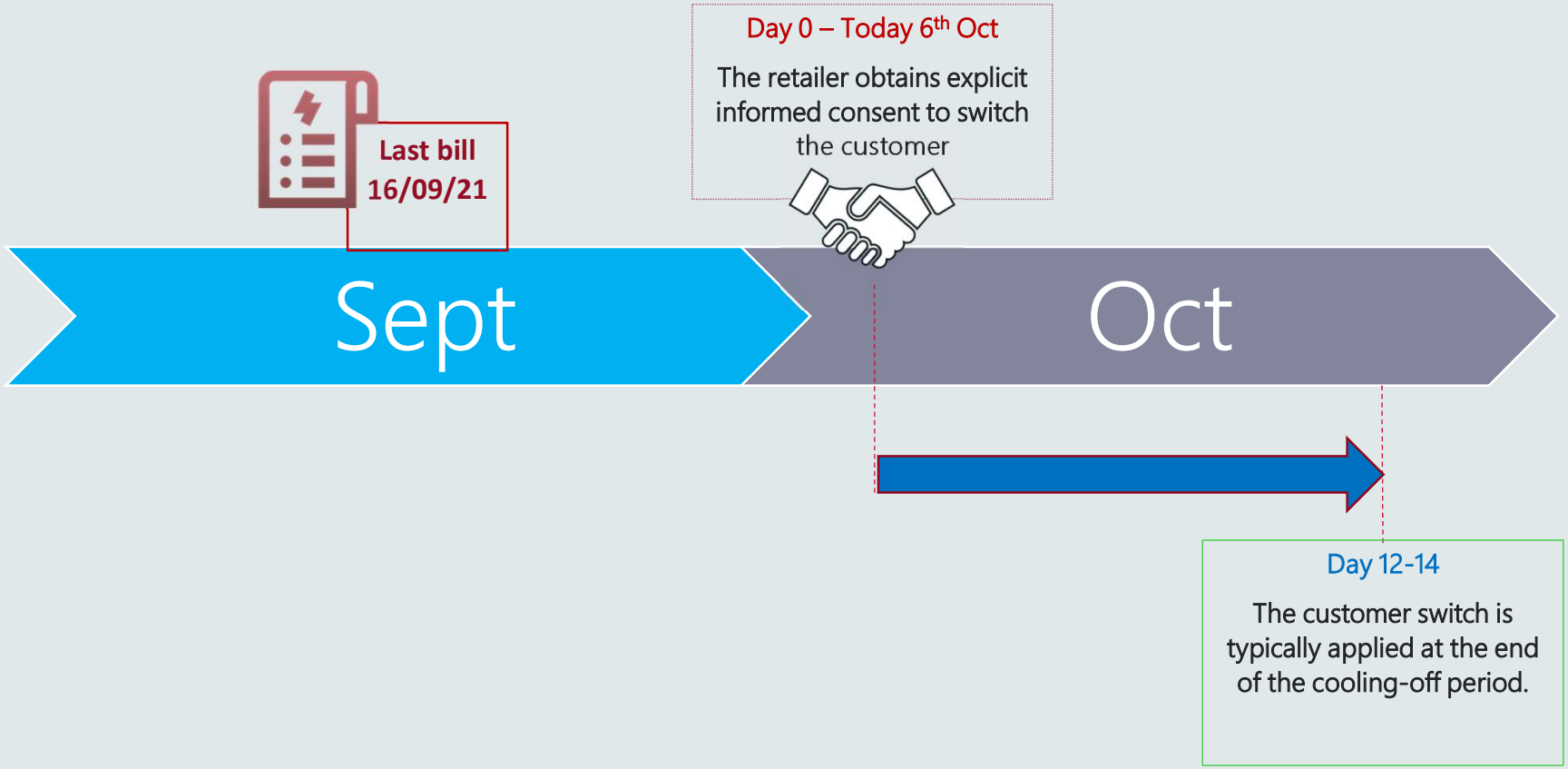
Customer switching timeline – manually read meters (old process)



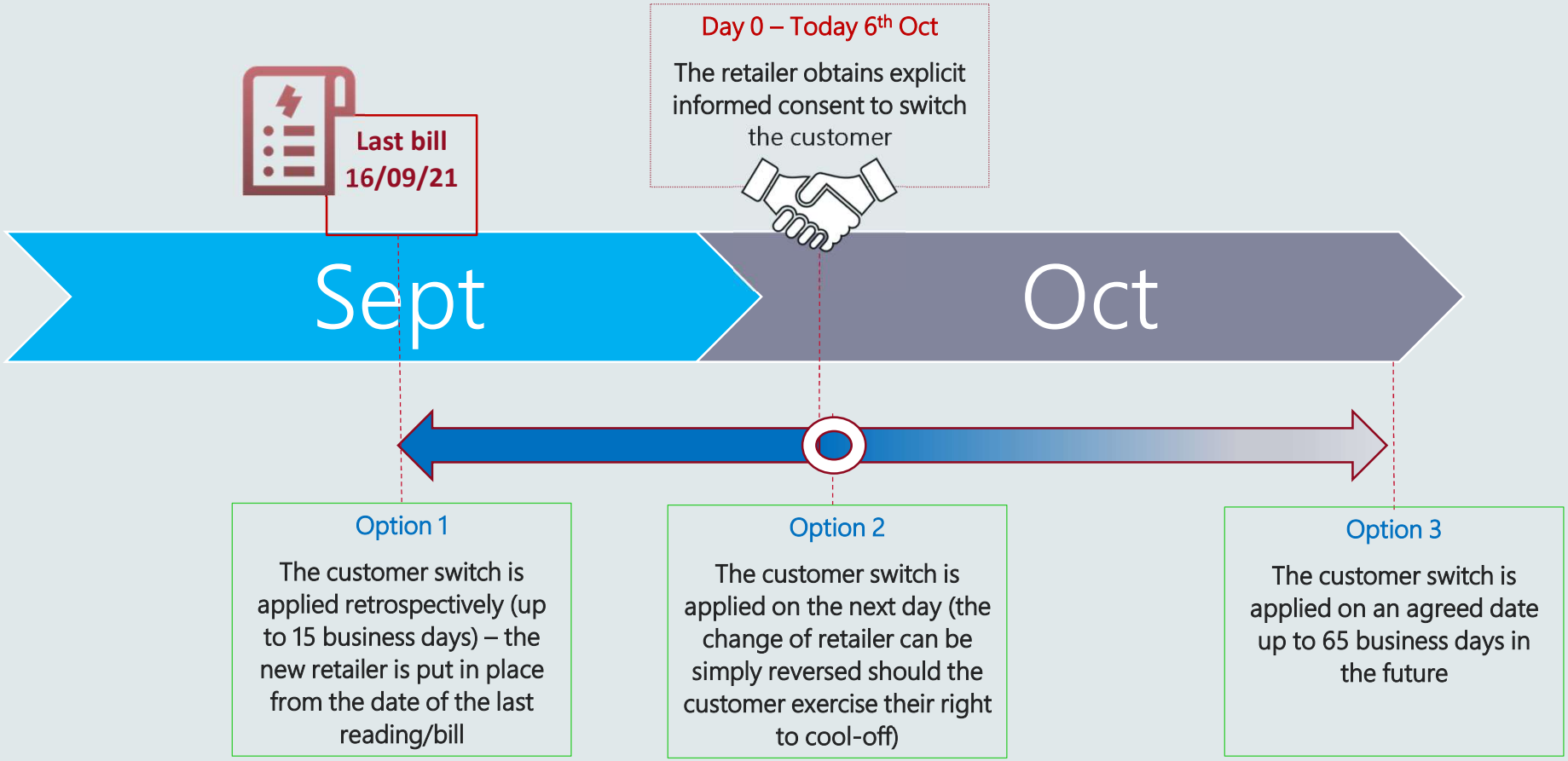
Customer switching timeline – manually read meters (new process)



Customer switching timeline – smart meter (old process)



Customer switching timeline – smart meters (new process)



5 Minute Settlement (5MS) Program update

AEMO's program to implement the changes for the five-minute settlement and global settlements rules

Anne-Marie McCague

Background

PURPOSE

5MS PROGRAM
five minute settlement
& global settlement

The 5MS Program is implementing **two AEMC rules** for the **wholesale electricity** market – requires changes to **metering**, **retail & wholesale**, **settlement**, **bidding** and **NEM operational systems**.

five minute settlement

Why, What & When

- Settlement currently 30 mins, dispatch 5 mins.
- Settlement period will change to 5 mins.
- Commences **01-Oct-2021.**

Expected benefits

- ✓ Removes anomaly by aligning settlement & dispatch period – efficiencies for NEM operations & investments, supports orderly bidding.
- ✓ Better **price signal** for demand response, and for investment in **fast response technologies** (e.g.: batteries).

global settlement

Why, What & When

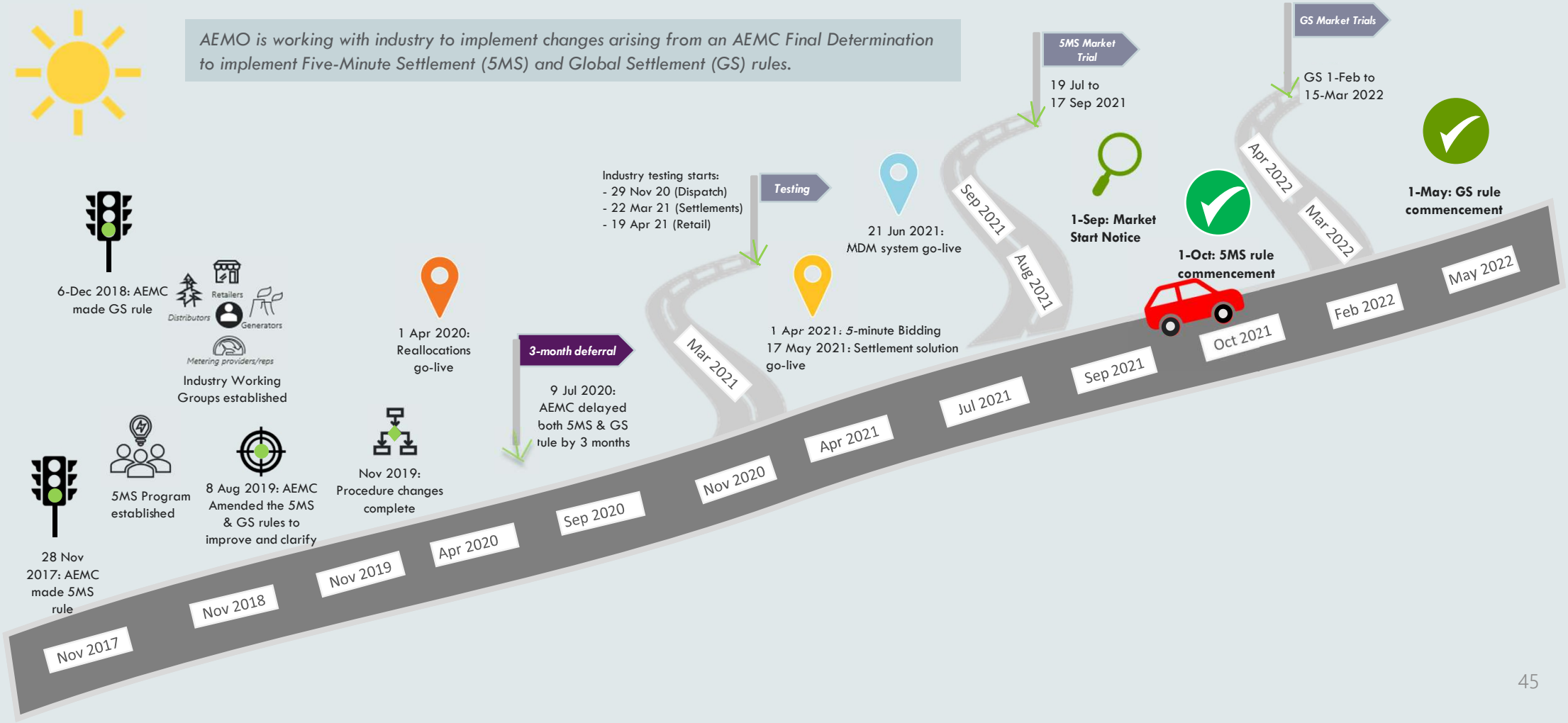
- Unaccounted for Energy (UFE) is currently charged to a limited number of 'local retailers'.
- With GS, all retailers share the cost of UFE.
- UFE published by AEMO from **01-Oct-2021.**
- GS commences **01-May-2022.**

Expected benefits

- ✓ Improved transparency, fewer settlement disputes and lower levels of UFE over time.
- ✓ Competition on equal terms.
- ✓ Improved risk allocation, enhanced incentives.
- ✓ It's efficient to implement GS within the 5MS Program, as it affects the same systems.

Journey so far

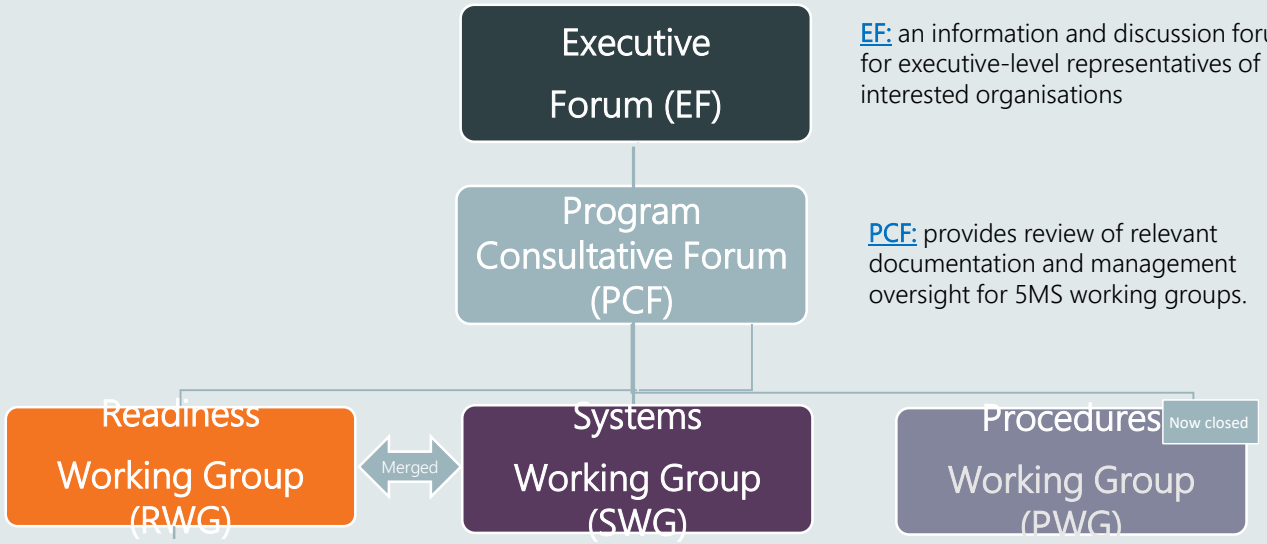
AEMO is working with industry to implement changes arising from an AEMC Final Determination to implement Five-Minute Settlement (5MS) and Global Settlement (GS) rules.



Key changes to NEM systems & procedures

Retail Production Release: 21-Jun-2021	Dispatch & Bidding Production Release: 1-Apr-2021	Settlements Production Release: 17-May-2021
Function Manages receipt and storage of market data (metering and standing data). Metering prepares data for market settlement and enables market reporting.	**Function** Manages demand forecasting and the dispatch price every 5 minutes (and aggregates spot price every 30 minutes). Ensures electricity demand is met.	**Function** Manages the calculation of financial liabilities and credits between market participants daily and settles all trade in the NEM on a weekly basis.
Scope of change • Enabled receipt of metering data every 5 minutes. • Enabled management of >2 trillion data points by 2028. Change profiling algorithms to derive 5 minute energy data. Enabled energy allocation at 5, 15 and 30 minute intervals.	**Scope of change** • Increased daily bidding intervals from 48 to 288. • New data structures receive, use and store 5-minute bids and offers. • Changes to calculate the floor price and price cap. • AEMO publishes 5-minute data.	**Scope of change** • Enabled settlement on 5 minute granularity, 5 minute price, and Marginal Loss Factors (MLF). • Settlements estimations now calculate energy transactions per 5 minute period. • Additional calculations (i.e. market ancillary services, FCAS), now calculated with 5 minute data.

Extensive Industry engagement since 2018



EF: an information and discussion forum for executive-level representatives of interested organisations

PCF: provides review of relevant documentation and management oversight for 5MS working groups.

RWG: coordinates readiness activities across the industry, particularly with respect to market testing and trials

SWG: seeks input from industry on system design and interface changes to support 5MS and GS implementation.

PWG: a forum to engage with industry stakeholders during the procedure development process.

ITWG: provides a forum for AEMO and industry stakeholders to engage in detail on testing matters related to the 5MS & GS implementation program.

Held **over 150** industry working groups & forums

Held **7 General Information Sessions** inviting everyone on the 5MS distribution list (>550 people), plus advertised on social media to extend our external reach

Distributed, and published the results of, **12 Industry Readiness Surveys** (includes 3 special or interim rounds)

Issued **15 Program Updates** (newsletters) to **over 550 people** who subscribe to receive 5MS updates.

How did AEMO assess readiness for 1 October 2021?

- In consultation with the 5MS working groups, AEMO defined the **Essential Criteria** that must be in place to support proper functioning of NEM from 1 October, 5MS rule commencement.
- The readiness assessment included using the **outcomes of the following activities** to assess AEMO and Market Participant readiness:

1. 5MS Market Trials

2. Industry Readiness Reporting

3. Metering Participant Reporting

4. AEMO Production Operation

- Following this process, AEMO concluded there were risks to commencing 5MS on 1 October and developed a **risk mitigation plan** in consultation with the industry working groups.
- On 1 September 2021, AEMO **published the 5MS start notice,** advising that AEMO and Market Participants were ready to operate under the 5MS rule from 1 October 2021.

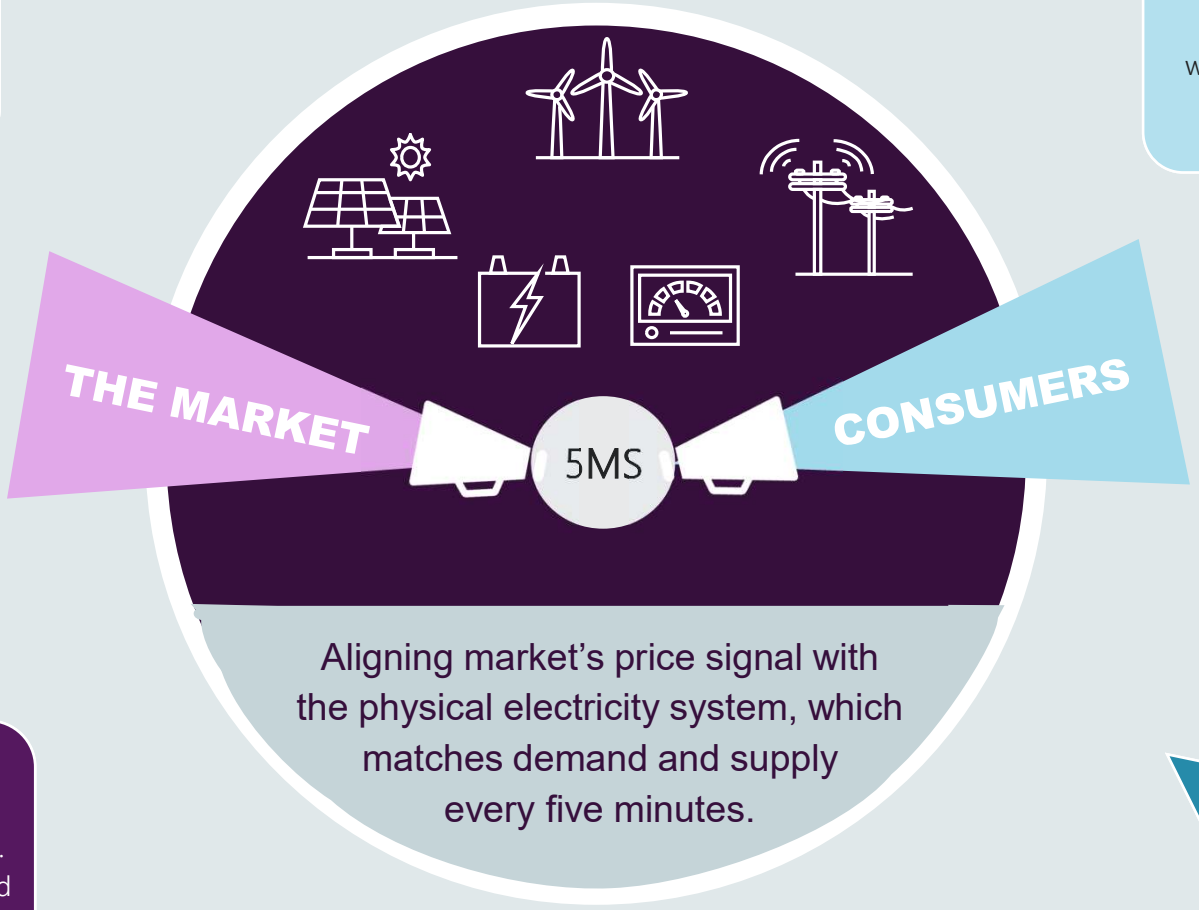
Five minute settlement changes go live on 1 October 2021

More **user-friendly interfaces** making it faster and clearer to perform tasks, and more **automated ways** of exchanging data**, through additional APIs.**

Improved bidding incentives.

Improved price signals for more efficient:

- Generation and use of electricity.
- Investment in capacity & demand response technologies to balance supply and demand.



Supporting the transition to renewables

Investment in fast response and flexible technologies which **can respond quickly** when the wind stops blowing and the sun stops shining.

Investment efficiency

Over time, improved price signals should lead to more efficient decisions by generators **lowering wholesale costs** which make up around one third of a typical bill.

Facilitating increased demand management

E.g.: factories that invest in smart IT can switch off machines quickly to **avoid high spot prices**. Homes with smart batteries can **earn a high spot price** by providing a boost of power when the system needs it.

Learn more about 5MS by visiting the AEMO and the AEMC websites

BREAK

AEMO
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Schedule Lite

Trent Morrow

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Scheduled Lite Initiative

What is Scheduled Lite?

- Voluntary mechanism that lower barriers and provides incentives for non-scheduled load and generation to participate in scheduling processes.
- The mechanism will be applicable to large flexible loads, aggregated DER and small generators (< 30MW). We expect participation in the market by a trader rather than direct participation of end users.

Development of Scheduled Lite mechanism

- ESB proposed the development of the Scheduled Lite mechanism as part of the DER Implementation Plan.
- The Scheduled Lite mechanism complements the implementation of Flexible Trading Arrangements, aiming to better integrate flexible demand and DER into the NEM.
- AEMO tasked with preparation of a high-level design and submission of rule change request by mid 2022.

Scheduled Lite Objectives

Create a framework to encourage more responsive resources	Reduce barriers to participation	More resources visible to the market, available in dispatch and providing system services should lead to increased competition.
Improve the efficiency of dispatch	Increase participation in scheduling, improve information	Additional information on likely behaviour or intentions, should improve dispatch outcomes.
Improve efficiency of forecasting and scheduling	Utilise information about price responsive resources in demand forecast	More accurate forecast information and decisions making for AEMO, network operators and market participants.

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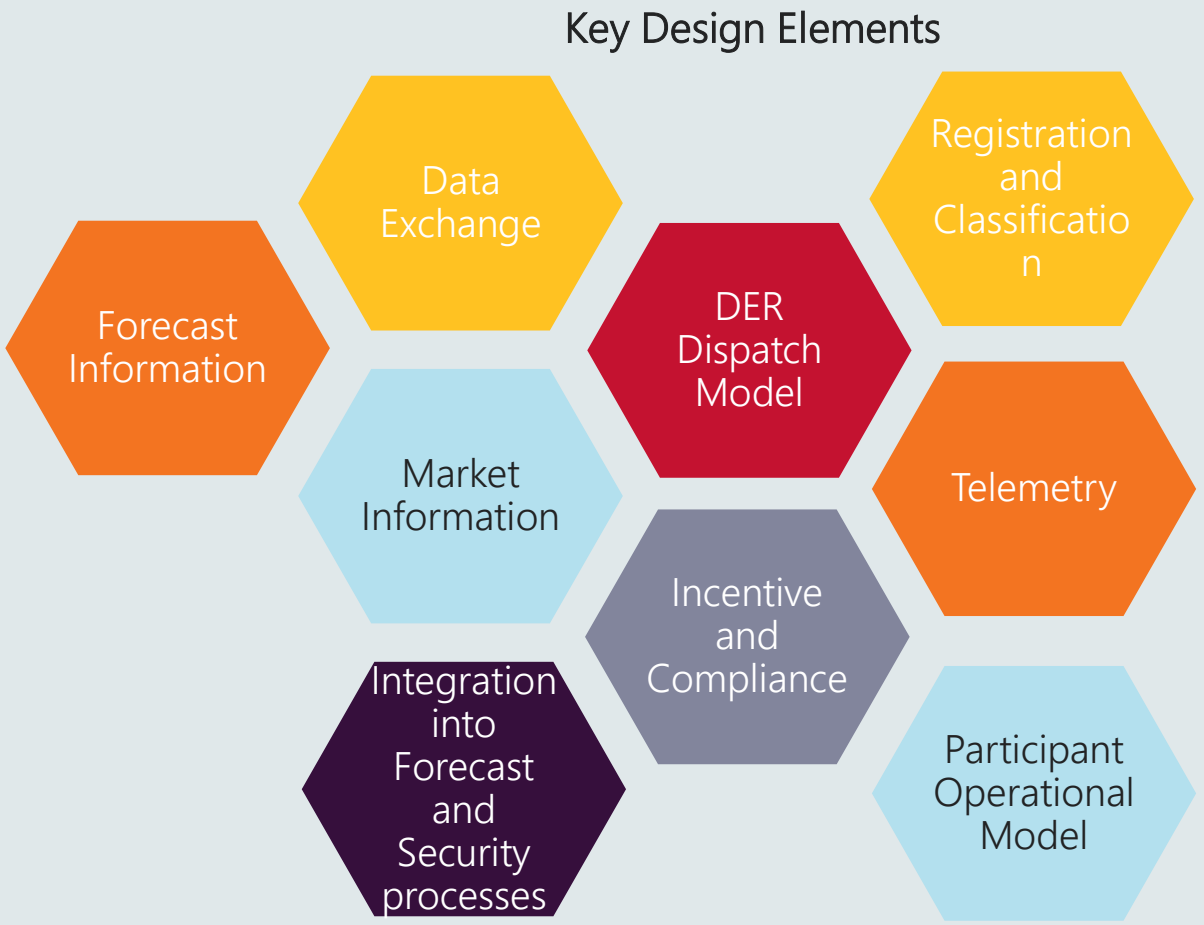
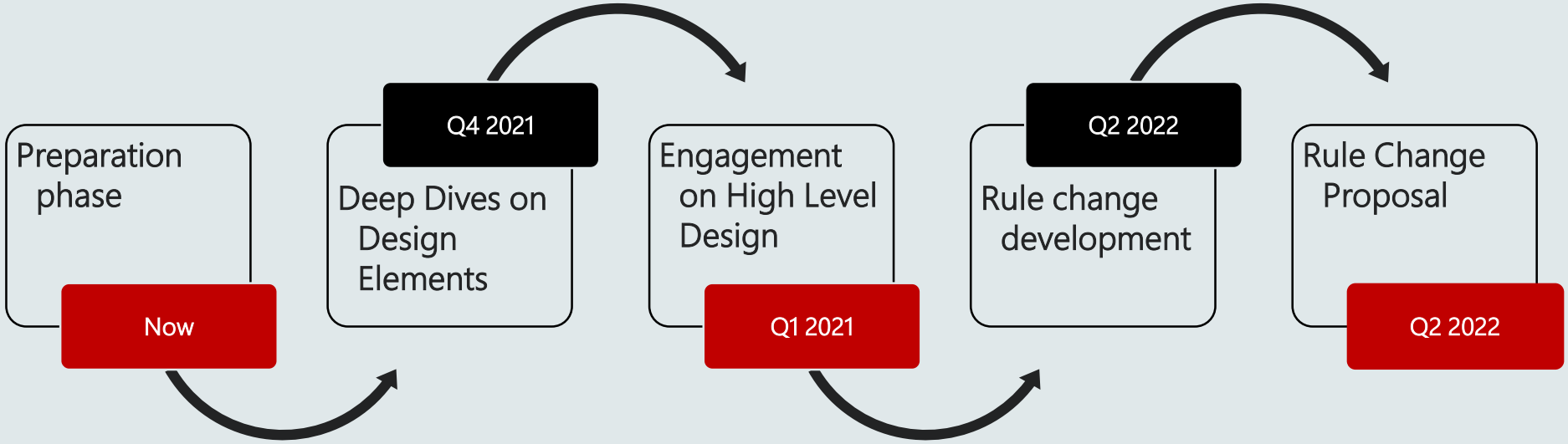
Scheduled Lite Models

Develop models for resources to opt into:

1. *Visibility Model:* provision of real-time and forecast information into the market scheduling processes.
2. *Dispatchability Model:* encourage participation in dispatch processes.



Scheduled Lite Initiative – Stakeholder Engagement



- Deep dives will consider key design elements and participation models for flexible demand, aggregated DER and non-scheduled generators (< 30MW).

Connections Reform Initiative

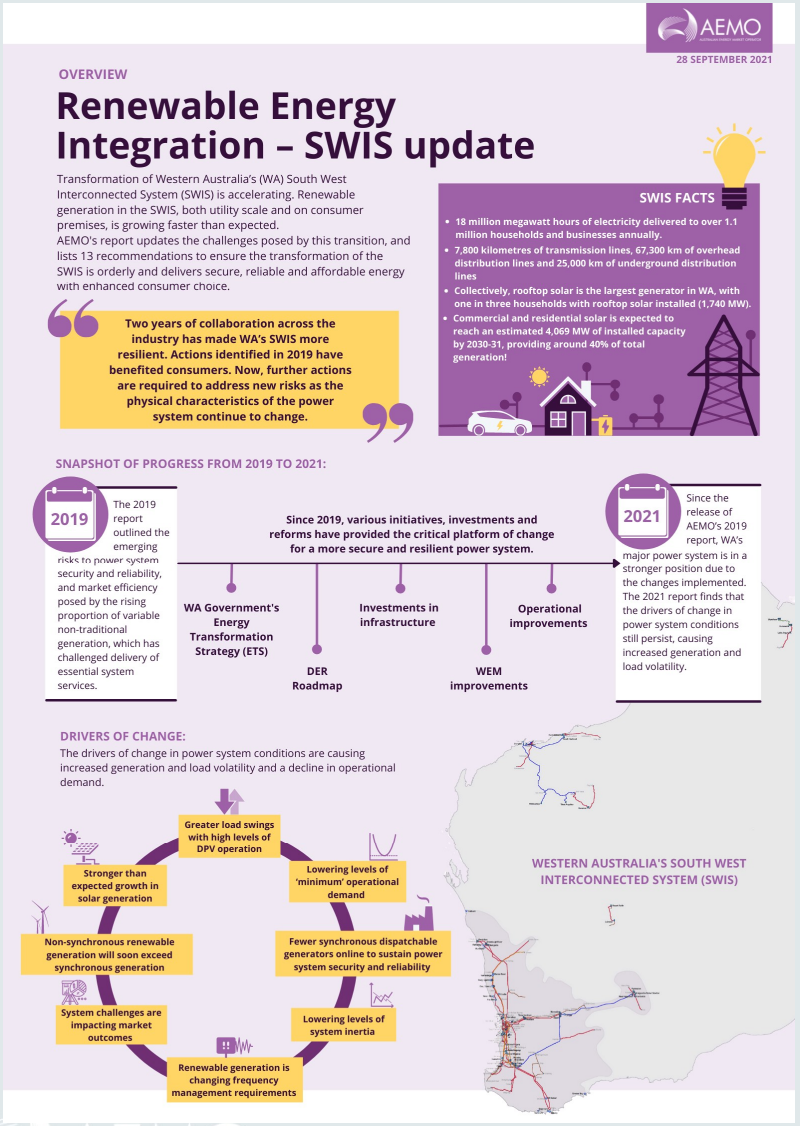
Alicia Webb

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

General update & overview

Marteena McKenzie

Recent publications & happenings



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28 SEPTEMBER 2021

OVERVIEW

Renewable Energy Integration – SWIS update

Transformation of Western Australia's (WA) South West Interconnected System (SWIS) is accelerating. Renewable generation in the SWIS, both utility scale and on consumer premises, is growing faster than expected.
AEMO's report updates the challenges posed by this transition, and lists 13 recommendations to ensure the transformation of the SWIS is orderly and delivers secure, reliable and affordable energy with enhanced consumer choice.

Two years of collaboration across the industry has made WA's SWIS more resilient. Actions identified in 2019 have benefited consumers. Now, further actions are required to address new risks as the physical characteristics of the power system continue to change.

SWIS FACTS

- 18 million megawatt hours of electricity delivered to over 1.1 million households and businesses annually.
- 7,800 kilometres of transmission lines, 67,300 km of overhead distribution lines and 25,000 km of underground distribution lines
- Collectively, rooftop solar is the largest generator in WA, with one in three households with rooftop solar installed (1,740 MW).
- Commercial and residential solar is expected to reach an estimated 4,069 MW of installed capacity by 2030-31, providing around 40% of total generation!

SNAPSHOT OF PROGRESS FROM 2019 TO 2021:

2019 The 2019 report outlined the emerging risks to power system security and reliability, and market efficiency posed by the rising proportion of variable non-traditional generation, which has challenged delivery of essential system services.

Since 2019, various initiatives, investments and reforms have provided the critical platform of change for a more secure and resilient power system.

- WA Government's Energy Transformation Strategy (ETS)
- DER Roadmap
- Investments in infrastructure
- WEM improvements
- Operational improvements

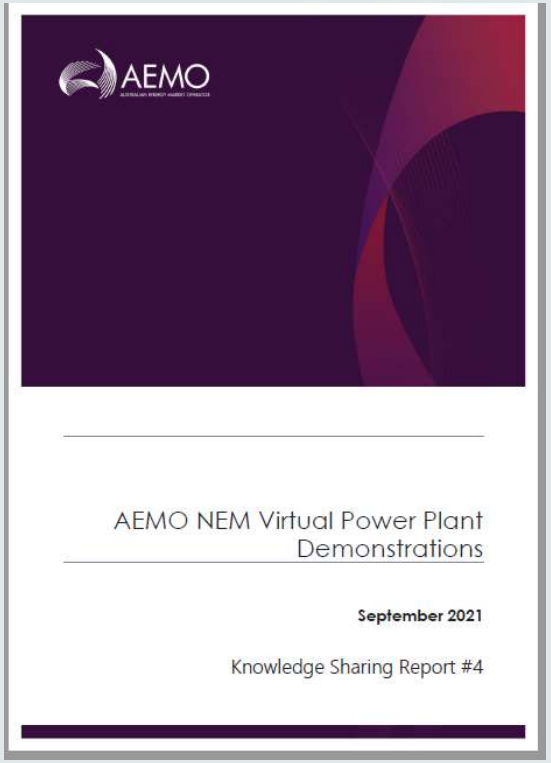
2021 Since the release of AEMO's 2019 report, WA's major power system is in a stronger position due to the changes implemented. The 2021 report finds that the drivers of change in power system conditions still persist, causing increased generation and load volatility.

DRIVERS OF CHANGE:

The drivers of change in power system conditions are causing increased generation and load volatility and a decline in operational demand.

- Greater load swings with high levels of DPV operation
- Lowering levels of 'minimum' operational demand
- Fewer synchronous dispatchable generators online to sustain power system security and reliability
- Lowering levels of system inertia
- Renewable generation is changing frequency management requirements
- System challenges are impacting market outcomes
- Non-synchronous renewable generation will soon exceed synchronous generation
- Stronger than expected growth in solar generation

WESTERN AUSTRALIA'S SOUTH WEST INTERCONNECTED SYSTEM (SWIS)



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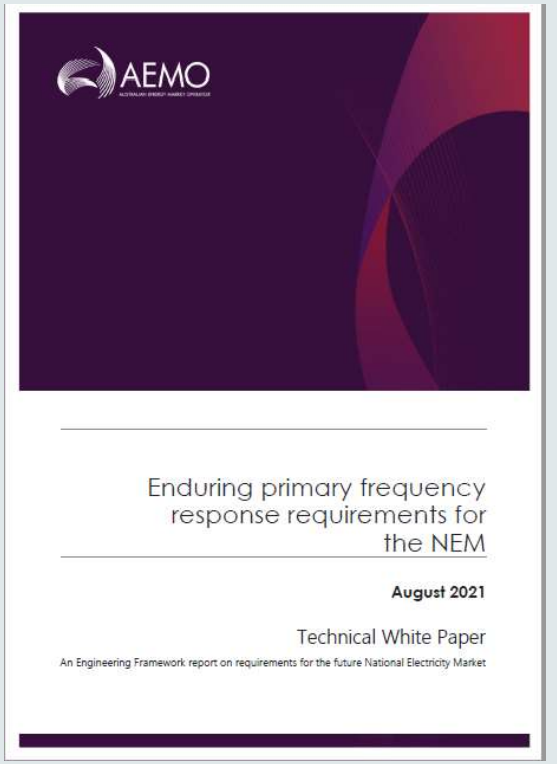
AEMO NEM Virtual Power Plant Demonstrations

September 2021

Knowledge Sharing Report #4



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Enduring primary frequency response requirements for the NEM

August 2021

Technical White Paper

An Engineering Framework report on requirements for the future National Electricity Market

Looking ahead & other business

Upcoming publications

- Quarterly Energy Dynamics Q3 report, late October
- Summer Readiness report and engagement, end of November
- AEMO annual report end of October

Upcoming forums & engagement activities

- AER seeking nominations for their Customer Consultative Panel by 12 October, particularly seeking input from diverse consumer groups.
- Late November Summer Readiness Plan
- Call for agenda items for final Consumer Forum of the year 15 December
- Consumer Forum Pulse survey
- Upcoming energy education courses: National Electricity Market (NEM) overview, Connecting and registering generators, ancillary services & others

Other business and close