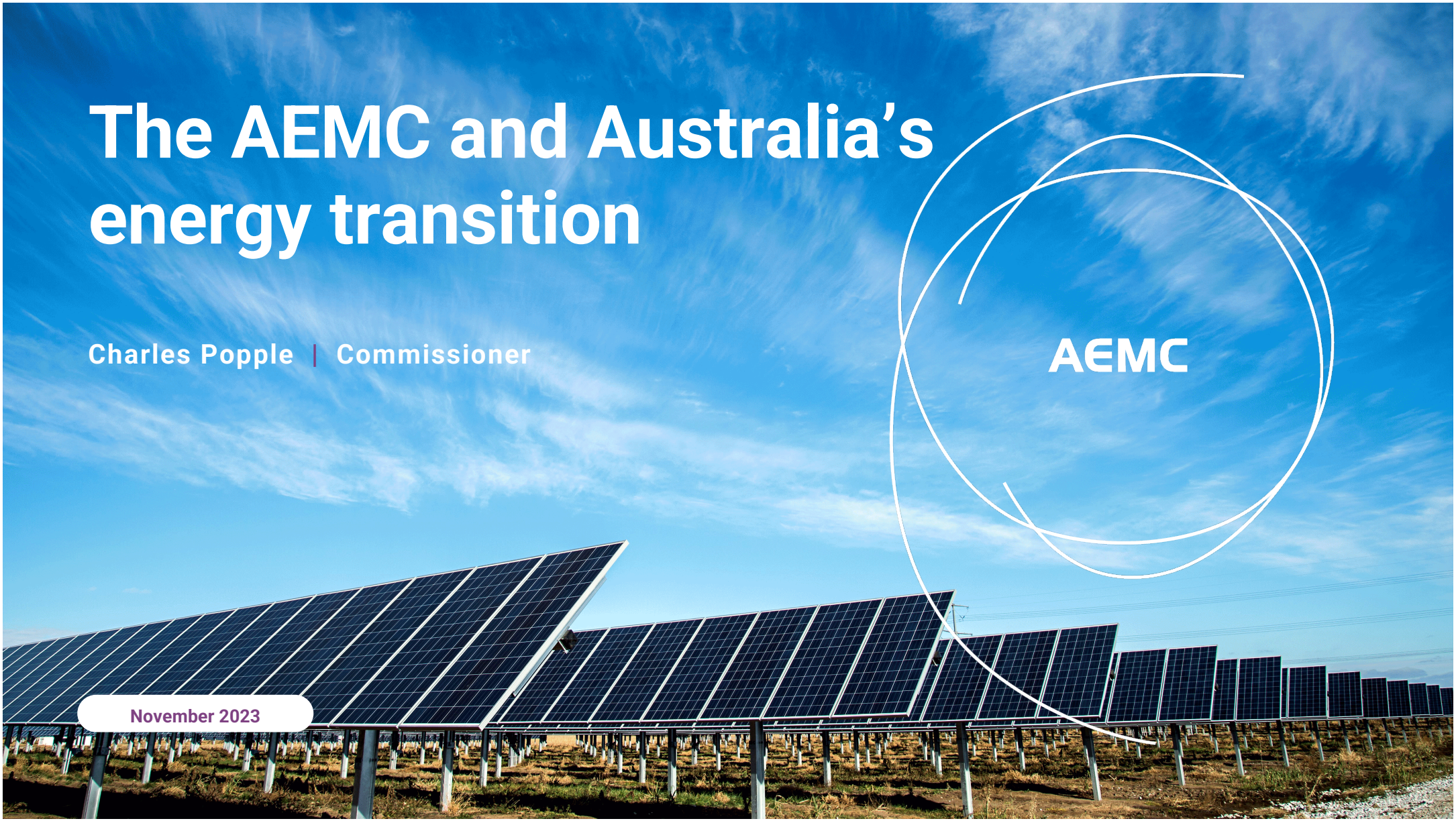
The AEMC and Australia's energy transition

Charles Popple | Commissioner

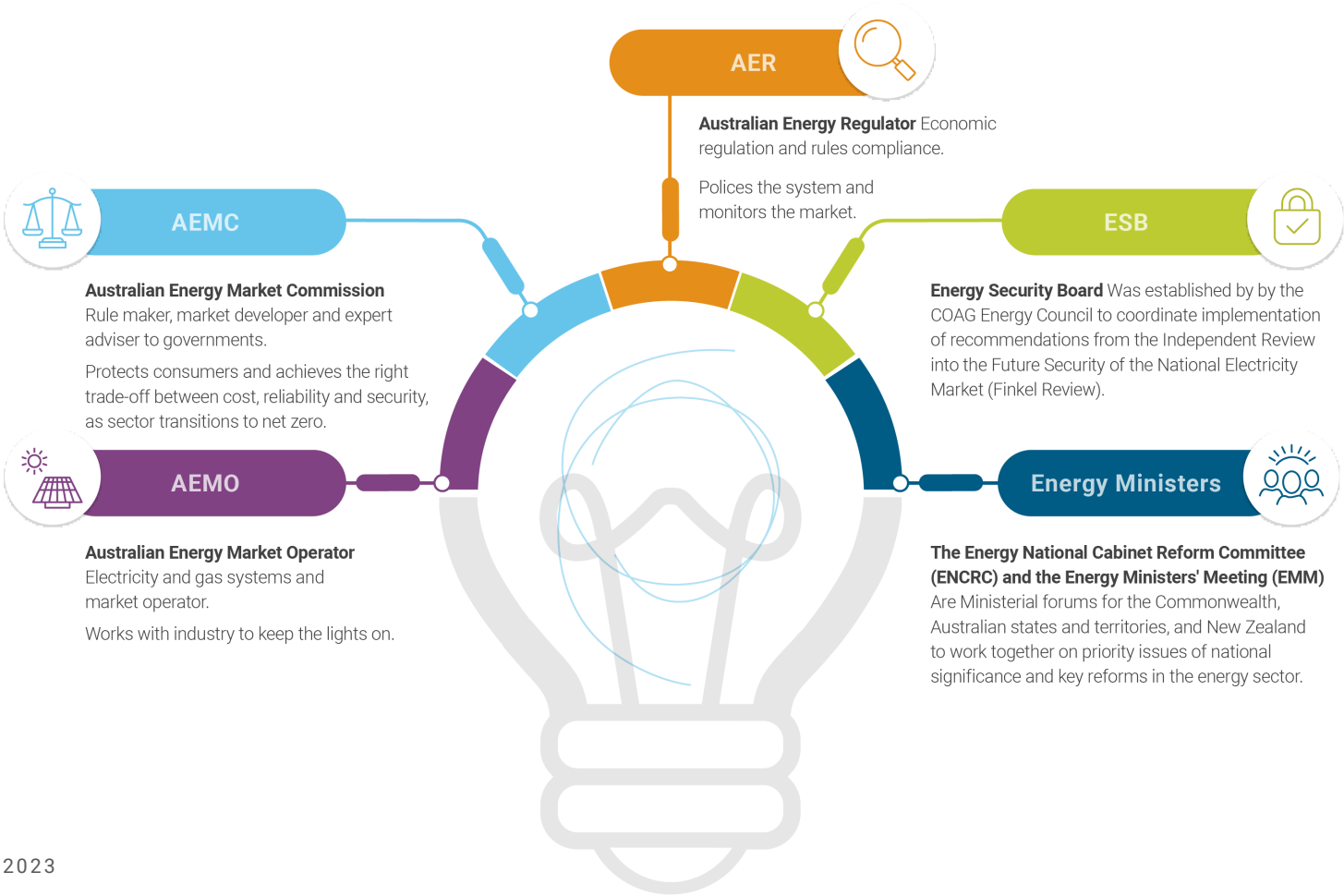
AEMC



November 2023

Agenda

How the market bodies work



What does the Energy Security Board (ESB) do?

ESB is tasked with taking a holistic look at what changes are required so the NEM can meet the needs of consumers in a future of diverse sources of non-dispatchable generation, demand response, storage, and distributed energy protection.

Work on four key workstreams, that **address aspects of how electricity is generated and dispatched**, how consumers can access the services they want and how investment can occur in the most efficient way to avoid unnecessary costs.

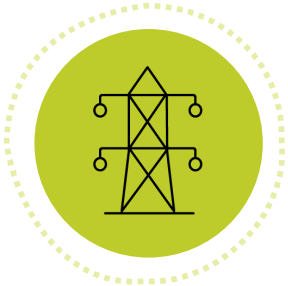
Objective of the reform work is to **ensure we have the appropriate tools in place** to support an orderly transition that minimises consumer costs and maintains reliability and security.

Key ESB workstreams

Resource adequacy and ageing generator retirement – *RAMS*

Stream of work seeks to **provide the right suite of incentives to support the orderly retirement of thermal generators** and encourage timely investment in a mix of new resources to maintain reliability.

Transmission and Access – *TAR*



Stream of work is looking **at how to better coordinate new generation** and network build to make sure the broader system is built and used efficiently – in a way that minimises costs for energy users.

Consumer Energy Resources – *CER*

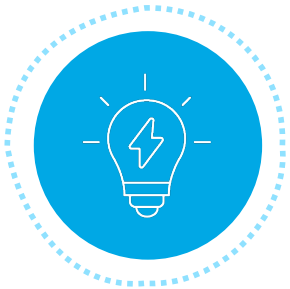
Stream of work is firmly **focused on removing barriers** and increasing uptake for customers, and resolving the complex technical issues around standards and interoperability.

Essential System Services – *ESS*

Stream of work is looking **at how we deliver the critical things like frequency, inertia and operating reserves** – that have traditionally been provided for free by thermal generation as plants retire.

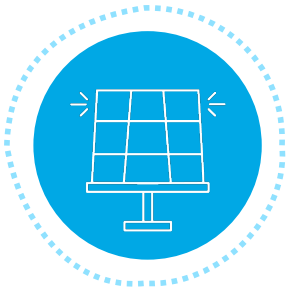
Key challenges and opportunities facing the market

1



Reliability and capacity

2

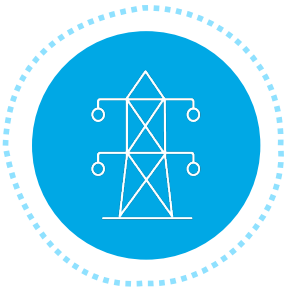


Increase renewables, ensuring system security (ESS), and low demand

3

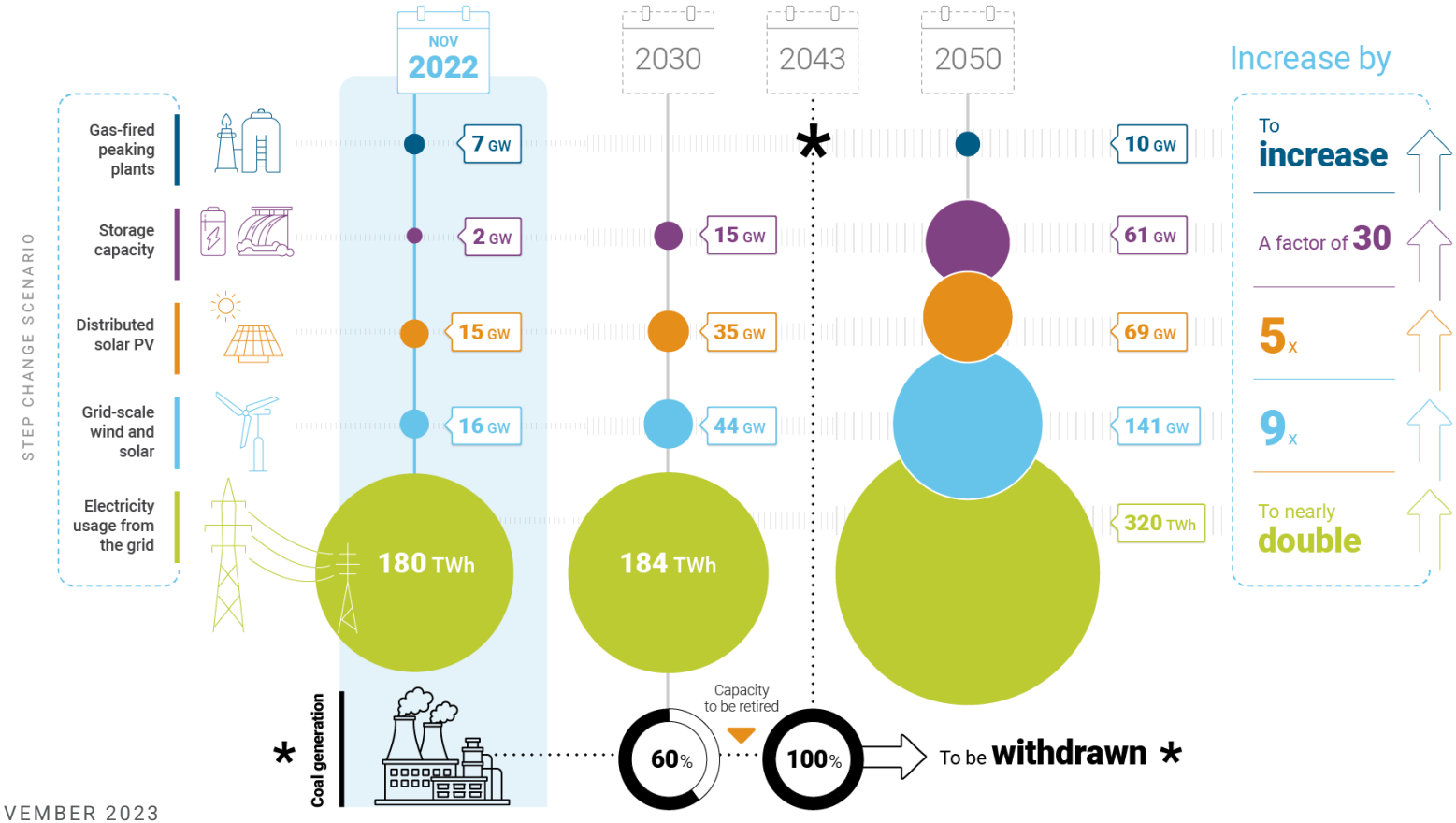
CER, integration and future work on DSP and two-sided markets

4



Transmission access

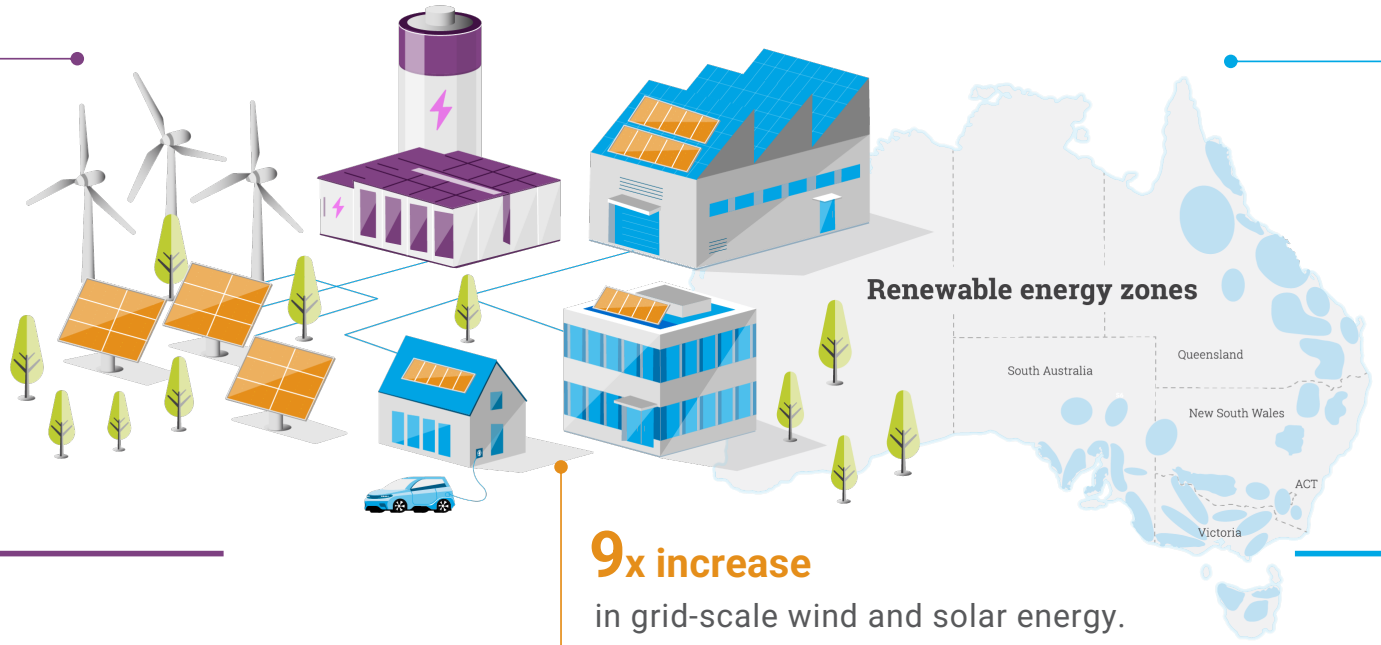
‘A once-in-a-century transformation in the way electricity is generated and consumed.’



The task ahead

AEMO's Integrated system plan ***step change scenario***

Doubling
of electricity generation **by 2050**.

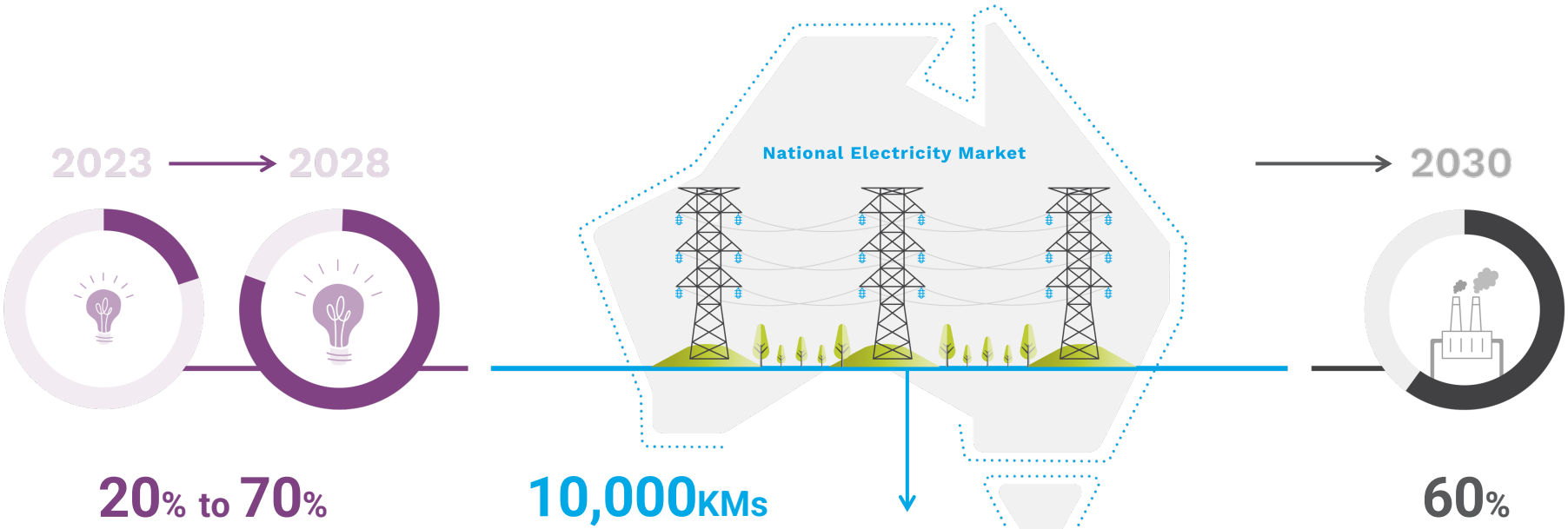


9x increase
in grid-scale wind and solar energy.

Large projects mainly in state **renewable energy zones** will have **141GW** of capacity – compared with current levels of 16GW.

Integrated system plan

AEMO's Integrated System Plan ***step change scenario***



20% to 70%

of energy projects **over the next five years** will increase in the national infrastructure pipeline.

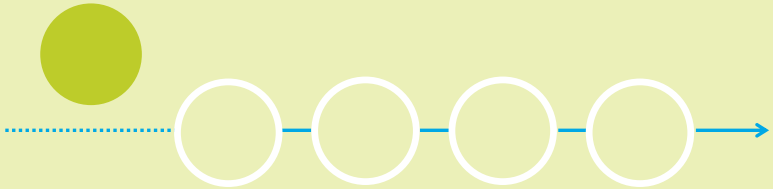
10,000KMs

of new transmission lines are needed to connect these projects to the NEM – that's about **two-thirds the perimeter of Australia.**

60%

of coal will **be withdrawn.**

EMISSIONS REDUCTION



We're working with jurisdictions and the other market bodies to implement the new objective in a way that's consistent with our overriding aim – to deliver a well-priced, safe, reliable and secure supply of energy in a decarbonising economy.

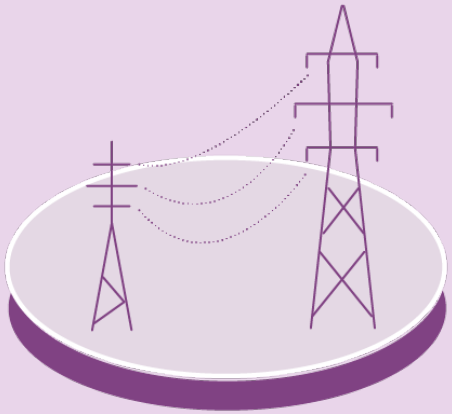
Emissions reductions

Subheading to go here

Jurisdiction	2030 emissions target	2050 emissions target	Renewables
Commonwealth	43% below 2005	Net zero	82% by 2030
ACT	65–75% below 1990	Net zero	100% (achieved)
New South Wales	50% below 2005	Net zero	25 TWh pa by 2030 (35-40%)
Northern Territory	–	Net zero	50% by 2030
Queensland	30% below 2005	Net zero	50% by 2030, 80% by 2035
South Australia	50% below 2005	Net zero	100% by 2030
Tasmania	Net zero (or lower)	Net zero – or lower	150% by 2030, 200% by 2040
Victoria	45–50% below 2005	Net zero	50% by 2030
Western Australia	80% reduction Govt below 2020	Net zero	–

TRANSMISSION REFORM

Making transmission investment and delivery more timely and efficient to enable the transition to net zero.

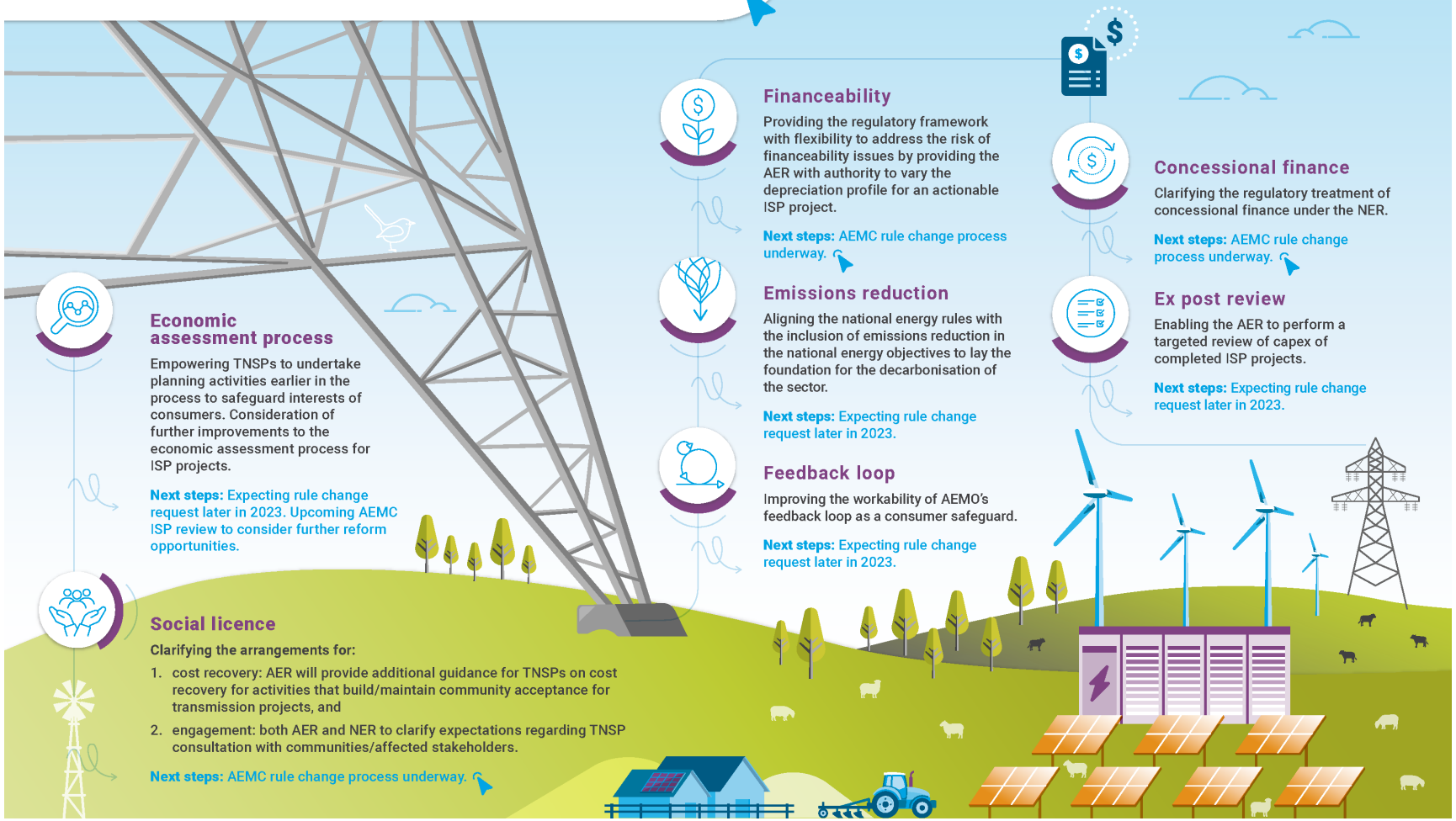


- economic assessment process
- social licence
- financeability
- emissions reduction
- feedback loop
- concessional finance
- ex post review.

Making transmission investment and delivery more timely and efficient – to enable the transition to net zero

RECOMMENDATIONS FROM THE AEMC TRANSMISSION REVIEW

The review has made recommendations for changes to the regulatory framework which promote the timely and efficient investment in and delivery of major transmission. These recommendations will help protect consumers against significant increases in future electricity prices as we transition to net zero.



Economic assessment process

Empowering TNSPs to undertake planning activities earlier in the process to safeguard interests of consumers. Consideration of further improvements to the economic assessment process for ISP projects.

Next steps: Expecting rule change request later in 2023. Upcoming AEMC ISP review to consider further reform opportunities.

Social licence

Clarifying the arrangements for:

1. cost recovery: AER will provide additional guidance for TNSPs on cost recovery for activities that build/maintain community acceptance for transmission projects, and
2. engagement: both AER and NER to clarify expectations regarding TNSP consultation with communities/affected stakeholders.

Next steps: AEMC rule change process underway.

Financeability

Providing the regulatory framework with flexibility to address the risk of financeability issues by providing the AER with authority to vary the depreciation profile for an actionable ISP project.

Next steps: AEMC rule change process underway.

Emissions reduction

Aligning the national energy rules with the inclusion of emissions reduction in the national energy objectives to lay the foundation for the decarbonisation of the sector.

Next steps: Expecting rule change request later in 2023.

Feedback loop

Improving the workability of AEMO's feedback loop as a consumer safeguard.

Next steps: Expecting rule change request later in 2023.

Concessional finance

Clarifying the regulatory treatment of concessional finance under the NER.

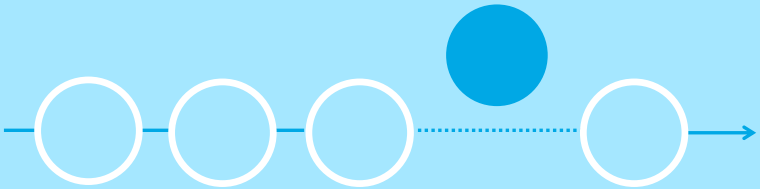
Next steps: AEMC rule change process underway.

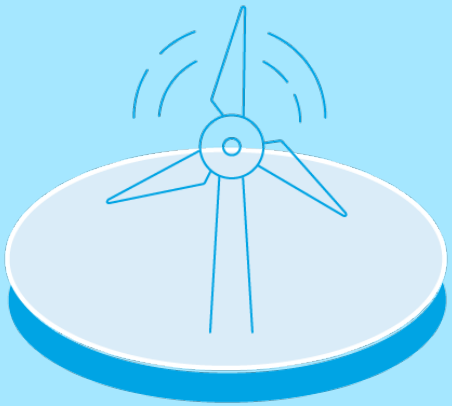
Ex post review

Enabling the AER to perform a targeted review of capex of completed ISP projects.

Next steps: Expecting rule change request later in 2023.

WHOLESALE MARKET INVESTMENT





We need market settings that encourage sufficient investment, and we are working to integrate with Commonwealth, state and territory initiatives.

As part of our body of work on reliability, we're looking to increase the market price cap to incentivise investment in the national electricity market.

CONNECTIONS

Solving the issues around connections – a significant reform that would facilitate more power generation.

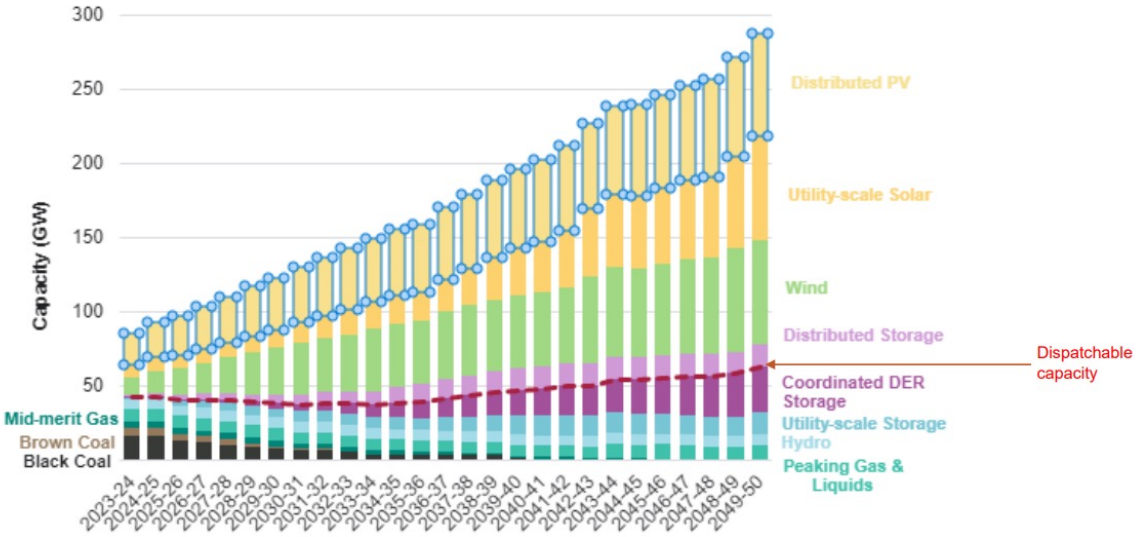
We are addressing this through:

- our reactive current rule change
- Clean Energy Council's rule change request on R1 connections
- expected request from AEMO on the implementation of the system strength framework and impact on generator connections
- enhanced information reforms.

Reliability and capacity

- Transparency of generator availability.
- Jurisdictional strategic reserves.
- T3 Ministerial lever for the Retailer Reliability Obligation (RRO).
- Capacity Mechanism .
- Orderly exit of ageing thermal generators.
- Review of future of the wholesale market.

ISP forecast NEM capacity to 2050, step change scenario



Source: AEMO 2022 Integrated System Plan, page 9

Capacity Investment Scheme

In December 2022, Ministers endorsed in principle a new Commonwealth Capacity Investment Scheme, which is a Commonwealth revenue underwriting scheme available to all jurisdictions nationally. The scheme is designed to encourage new investment in clean dispatchable capacity to support reliability and reduce market volatility in Australia's rapidly changing energy market.

Consumer energy resources (CER)

CER Technical standards review

Metering review

Integrating price-responsive resources into the NEM rule change

Unlocking CER benefits through flexible trading rule change

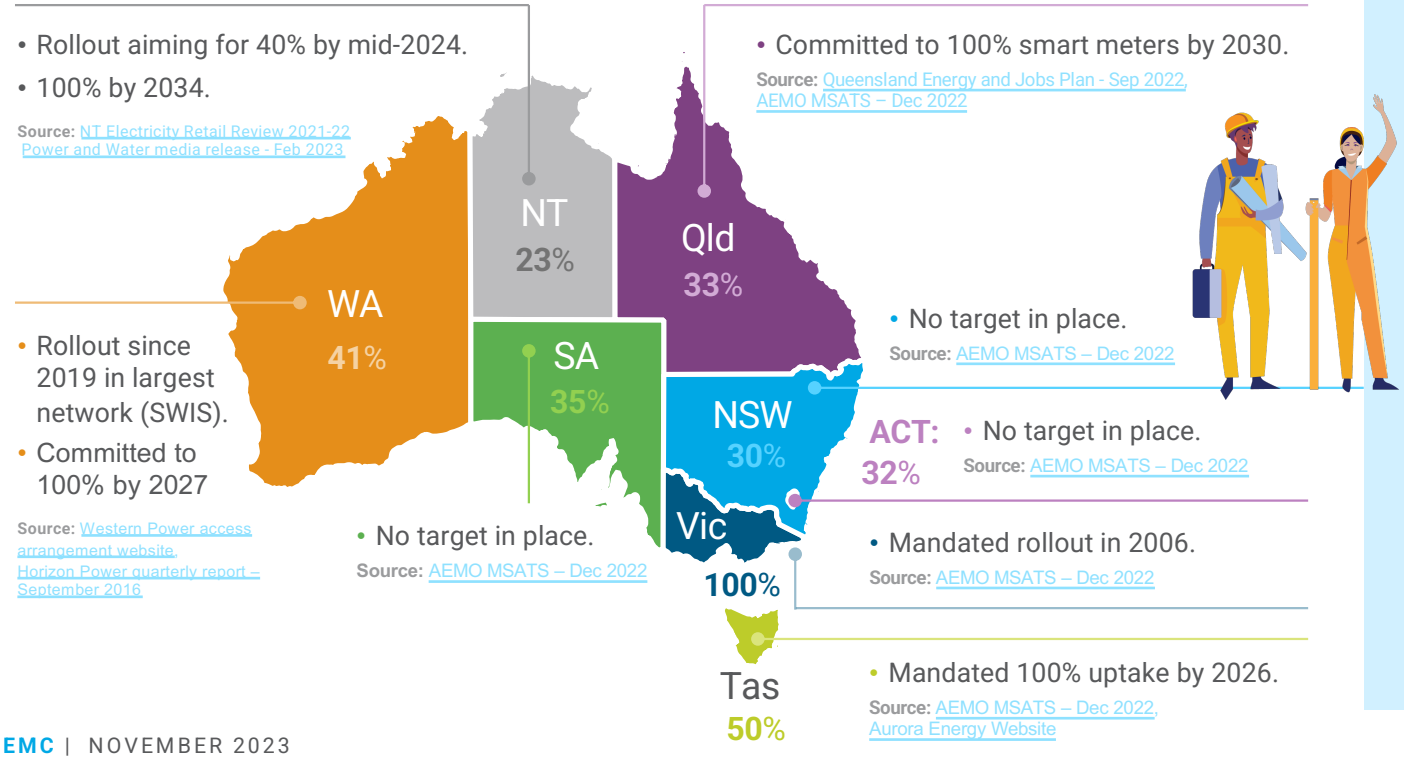
Consumer energy resources workstreams update

CER is a priority area for the AEMC for the 2023-24 financial year

	AEMO RULE CHANGES		AEMC-LED REVIEWS	
	1 	2 	3 	4 
CER program overview	Unlocking CER benefits through flexible trading	Integrating price-responsive resources into the NEM	Regulatory framework for metering services	CER technical standards
	AEMO proposes to introduce **flexible trading** by enabling consumers to have CER separately metered and treated independently in market settlements. The rule change is considering enabling large consumers to engage with multiple service providers if they choose.	The AEMC is consulting on ways to better integrate **unscheduled price-responsive resources** (such as VPPs and hydrogen electrolysers) into the NEM. AEMO proposed to **integrate price-responsive resources** through a **voluntary** and **flexible** participation framework. This would assist AEMO to operate the market with growing renewables.	The AEMC has published its draft report, which sets out 20 recommendations and options to **accelerate the deployment of smart meters** across the NEM by 2030.	The review is considering compliance with, and enforcement of, **consumer energy resources technical standards** in the national electricity market.
2023 status	Directions paper ***3 August***	Consultation paper ***3 August***	Final report ***Scheduled August***	Final report ***Scheduled September***

Smart meters are a key enabler in the transition to net zero

Smart meters are foundational to a more connected, modern and efficient energy system that supports future technologies, services and innovation.



Our target is 100% smart meter coverage in the NEM by 2030

Achieving full uptake will help to unlock greater benefits in the short and long-term, for all households and small businesses, enabling:

- **Tracking of energy use and savings** – customers can access cheaper energy at the right times of the day.
- **Flexible pricing** – customers can choose an electricity plan that best suits their lifestyle.
- **Remote meter readings** – no more estimated bills and manual meter readings.
- **Faster detection of faults and power outages** – smart meters can help distribution businesses quickly identify if a customer's power is out and those alerts can speed up power reconnection.

Engineering challenges on the road to 100% renewables

Our energy future will be built on four key pillars. This drives AEMO's priorities, and the AEMC's system security work program

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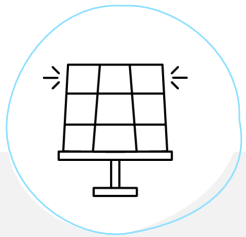
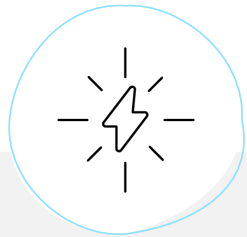
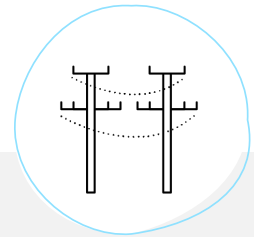
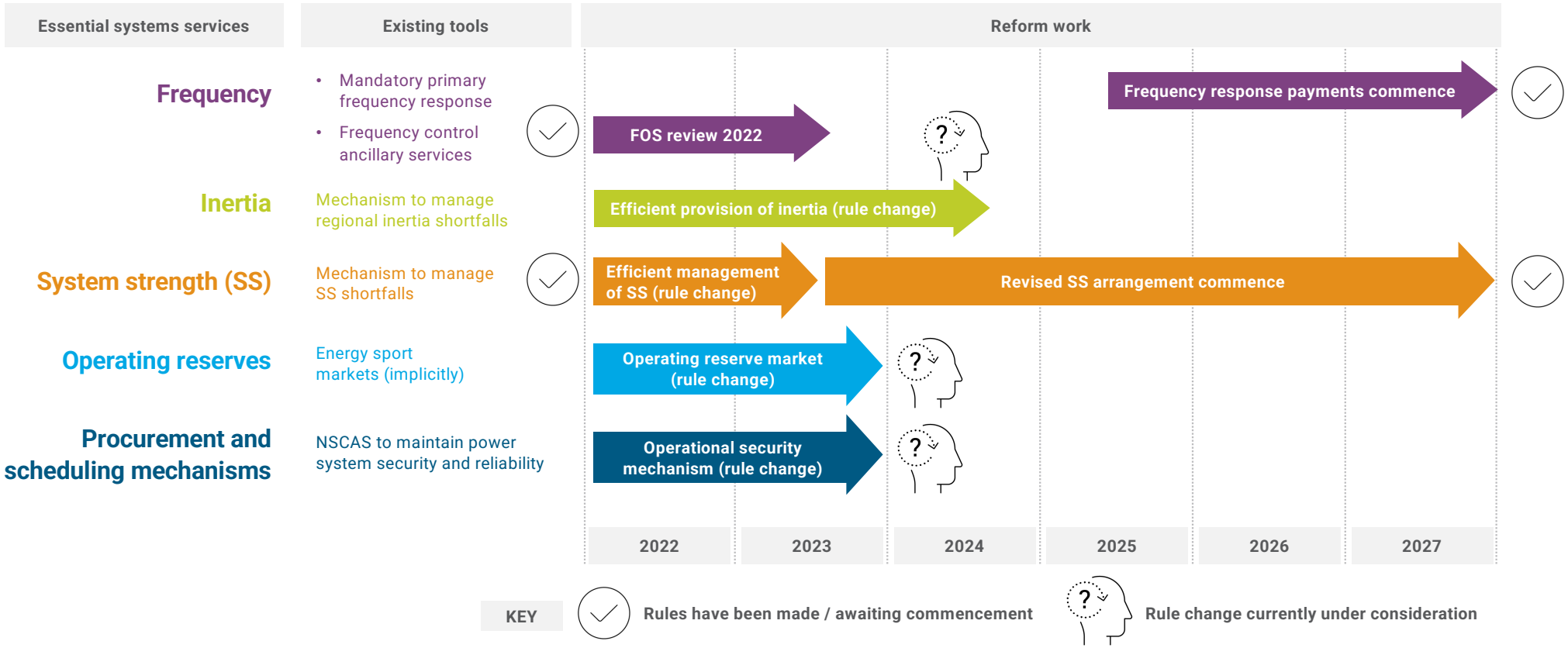
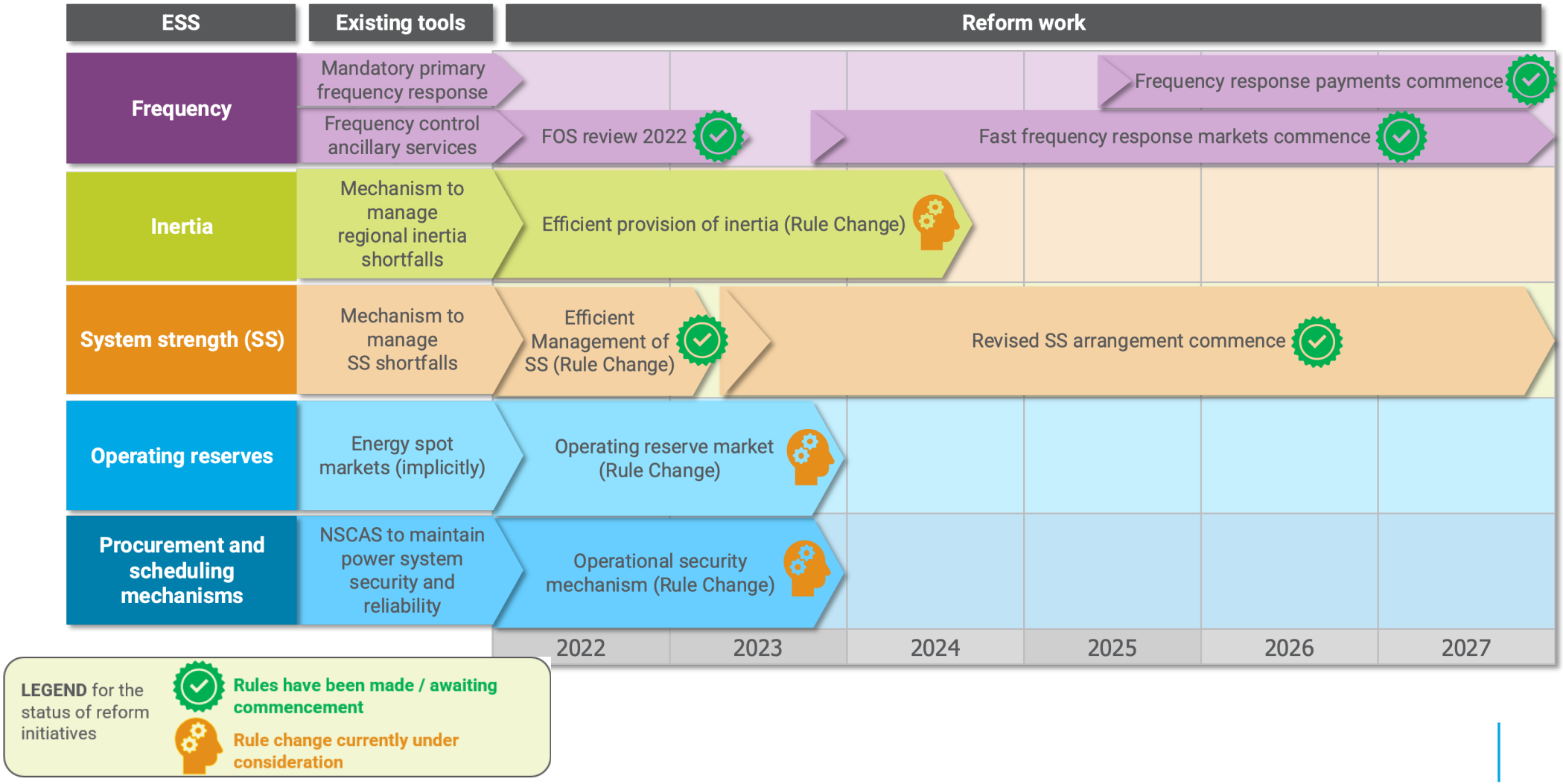
				
	Low cost renewable energy	**Firming technology**	**New transmission modernised distribution networks**	**Power systems that can run on 100% renewables**
AEMO	Enabling new technologies to address system needs		Enabling high penetrations of distributed energy resources	Conducting future power system studies Building operational readiness
AEMC	**AEMC Ensuring System Security work program**			

Essential systems services work program

Addressing the challenges




ESS
Existing tools
Reform work
Frequency
Mandatory primary frequency response
Frequency control ancillary services
FOS review 2022
Frequency response payments commence
Fast frequency response markets commence
Inertia
Mechanism to manage regional inertia shortfalls
Efficient provision of inertia (Rule Change)
System strength (SS)
Mechanism to manage SS shortfalls
Efficient Management of SS (Rule Change)
Revised SS arrangement commence
Operating reserves
Energy spot markets (implicitly)
Operating reserve market (Rule Change)
Procurement and scheduling mechanisms
NSCAS to maintain power system security and reliability
Operational security mechanism (Rule Change)
2022
2023
2024
2025
2026
2027
LEGEND for the status of reform initiatives
Rules have been made / awaiting commencement
Rule change currently under consideration

Ensuring System Security (ESS) on the road to 100% renewables

Engineering leads market design. In considering system security through the transition, the AEMC is working on key areas of reform in the NEM

1 

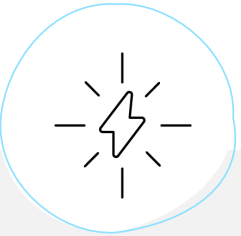
Operational Security Mechanism

2 

Frequency Operating Standards

3 

Inertia Rule Change

4 

Operating Reserves

AEMC

AEMC Ensuring System Security work program

Retail price regulation

1

The DMO and VDO were introduced in July 2019 (NSW, SA, SEQLD, VIC) to cap prices for standing offer customers. There are no default offers or retail price caps in gas.

2

Calculated annually by the AER (DMO) and ESC (VDO). DMO prices in FY 24 versus FY23 increased between 21% and 24% following large increases in wholesale costs.

3

There are issues to consider with price caps. Such as:

- Price compression (retailers increase their lowest offers)
- Increased risk to smaller non-integrated retailers. Issues and Impacts. Annual cap may need to change in volatile years
- Lower levels of innovation
- Higher barriers to entry, decreased competition through changed consumer behaviour.

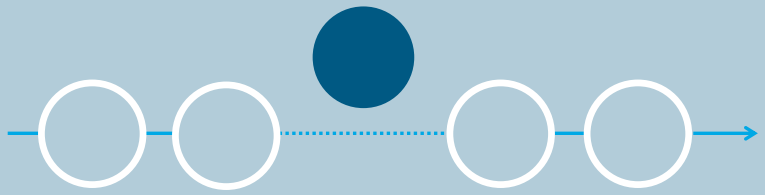
4

A comparison rate and good data / transparency may be a better long-term alternative.

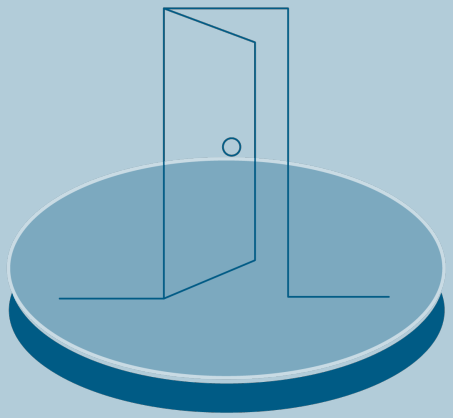
More information

https://www.aemc.gov.au/market-reviews-advice/advice-coag-energy-council-default-offer

ACCESS REFORM



Access reform will send signals to investors about the best places to locate generation, storage and dispatchable assets, so we only build the transmission we need. The proposed solution has come from industry.

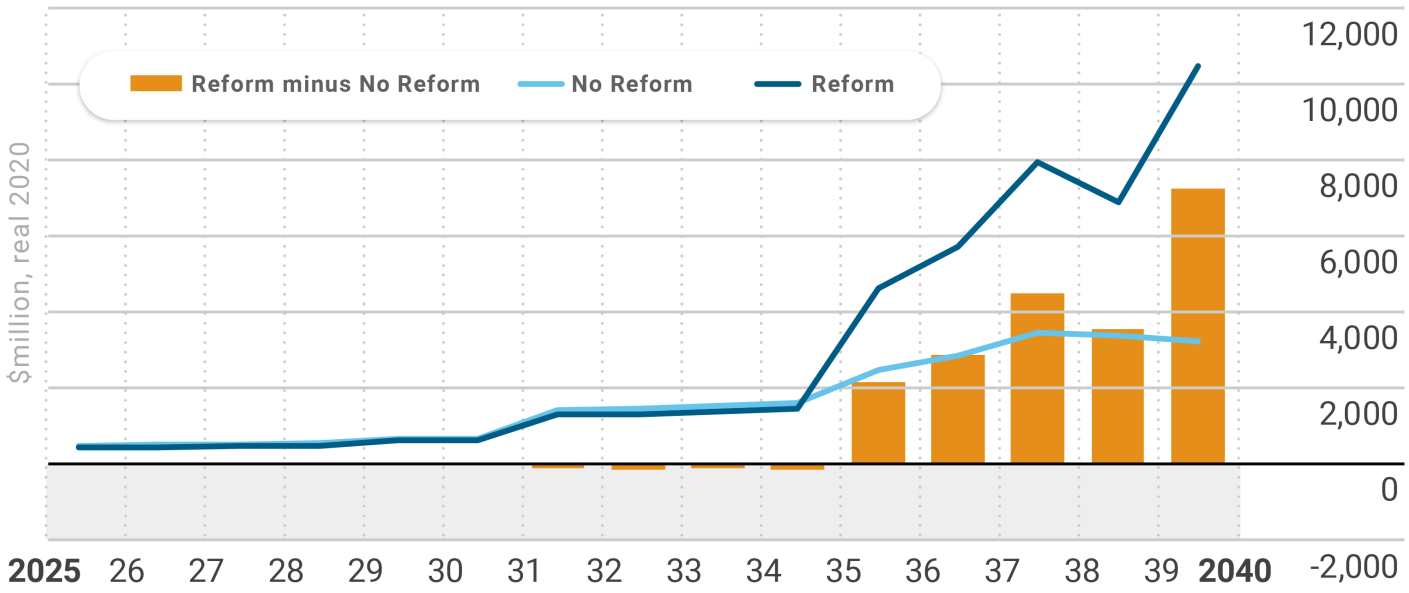


- indicates the best way to bid into the market
- incentivises providers of congestion relief
- avoids wasting solar and wind investments
- minimises unnecessary transmission
- makes greater use of existing renewables resources
- strengthens incentives for investors to participate in REZ schemes
- ensures a mix of assets within a REZ
- provides additional revenue streams for storage

Access reform is good for congestion

CRM trading reduces system costs

Congestion rent increases at the end of the horizon in the reform world ($million, real 2020)



Source: NERA calculation on PLEXOS results

Access reform is good for storage

Unlocking a key component of the energy transition

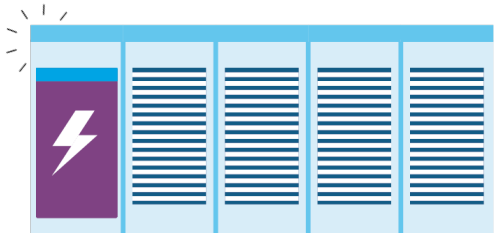
1 Storage and flexible loads will become a more critical part of our dispatchable generation mix and demand response.

2 Transmission access reform is designed to value and reward these assets for providing congestion relief services that have benefits to the whole system.

3 If we don't have a market that values these services, we will need to subsidise their investment.

4 The CRM design creates a new market to achieve a more cost-efficient dispatch. The efficiency gain is shared between CRM participants and enables the efficient operation of the network's significant transmission investments.

5 The CRM unlocks a new market for congestion relief and recognises the value that storage and scheduled load can provide to the energy system.



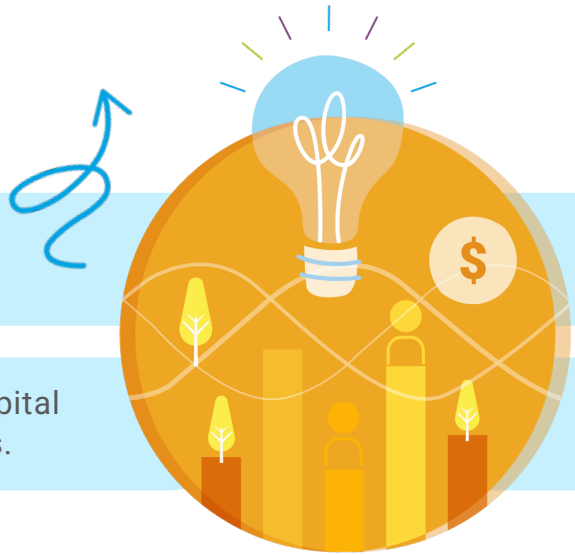
30x

Increase in storage capacity – 2022 v 2050 in the ISP.

Key findings of cost benefit analysis

Preferred model: priority access and a congestion relief market

- Quantified net benefits estimated at **$2.1 – $5.9 billion** in NPV terms.
- **Possible reduction in the cost** of capital for storage and generation investors.



- Emissions reductions of **23 million tonnes.**
- **Avoids need to redistribute value** between existing market participants.

BENEFITS COME FROM DISPATCH EFFICIENCY GAINS UNDER THE CRM AND CMM, AND INVESTMENT EFFICIENCY GAINS UNDER THE CONGESTION FEES OR PRIORITY ACCESS MODELS.

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