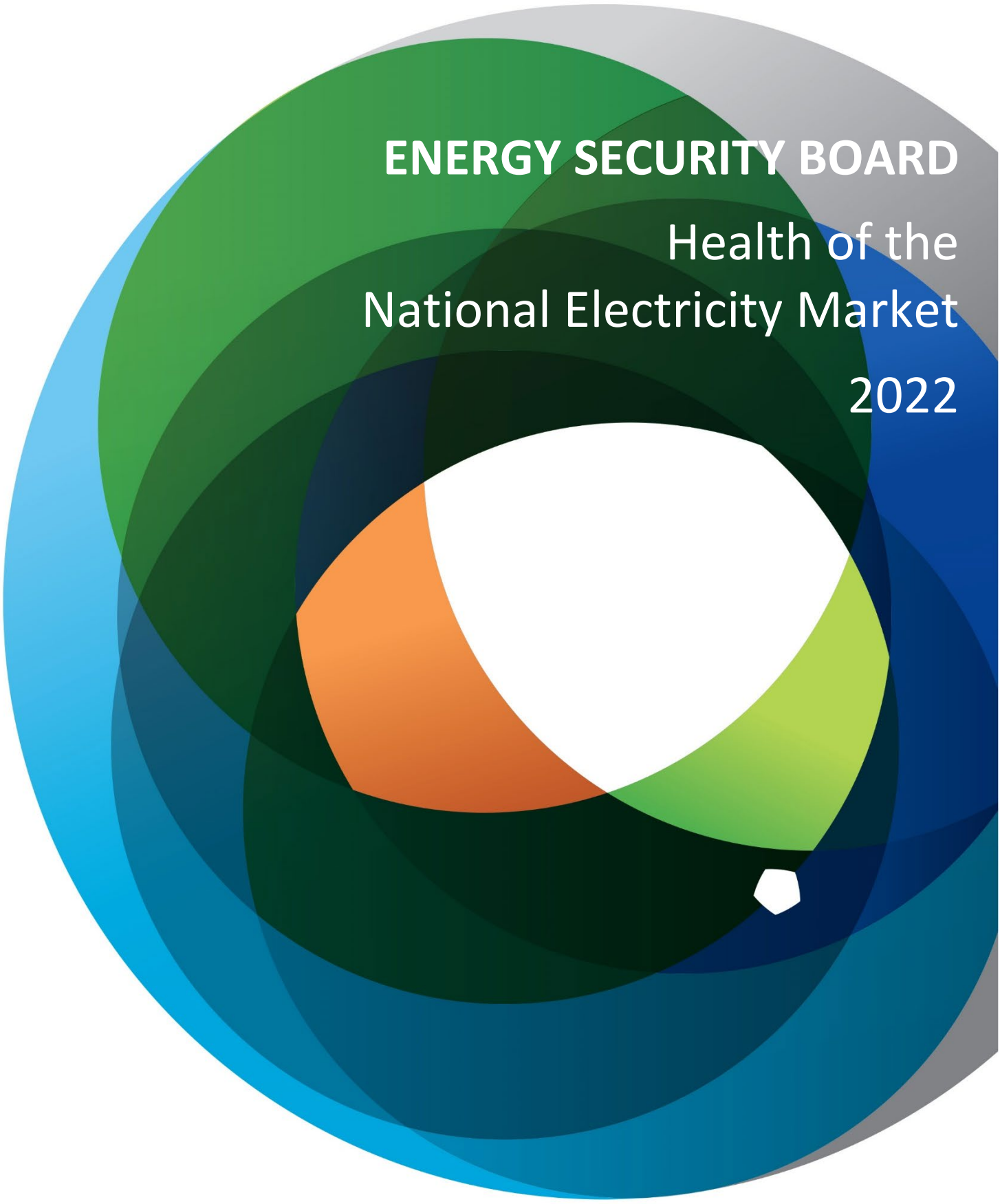

# ENERGY SECURITY BOARD

# Health of the National Electricity Market

# 2022

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**List of Abbreviations**

| | |
|---|---|
| ACCC | Australian Competition and Consumer Commission |
| ACT | Australian Capital Territory |
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| ASX | Australian Securities Exchange Ltd |
| CER | Consumer energy resources |
| DMO | Default market offer |
| ECA | Energy Consumers Australia |
| ESB | Energy Security Board |
| ESS | Essential system services |
| ESOO | Electricity Statement of Opportunities |
| EV | Electric vehicle |
| FCAS | Frequency control ancillary services |
| FFR | Fast frequency response |
| IBR | Inverter based resources |
| ISP | Integrated System Plan |
| MT PASA | Medium-term projected assessment of system adequacy |
| MW | Megawatt |
| MWh | Megawatt hour |
| NEL | National Electricity Law |
| NEM | National Electricity Market |
| NEO | National Electricity Objective |
| NERL | National Energy Retail Law |
| NGL | National Gas Law |
| NSW | New South Wales |
| PFR | Primary frequency response |
| PJ | Petajoule |
| PV | Photovoltaic |
| QLD | Queensland |
| REZ | Renewable Energy Zone |
| RIT-T | Regulatory Investment Test for Transmission |
| ROLR | Retailer of Last Resort |
| RRO | Retailer Reliability Obligation |
| RSS | Reliability Standard and Settings |
| SA | South Australia |
| TNSP | Transmission Network Service Provider |
| TTSS | Threat to system security |
| USE | Unserved energy |
| VIC | Victoria |
| VPP | Virtual power plant |

# Executive Summary

The Energy Security Board (ESB) is tasked to report annually on the health of the National Electricity Market (NEM) and progress against the Strategic Energy Plan.[1] The Strategic Energy Plan sets out a vision for the future of the NEM, framed through six desired outcomes:

- affordable energy and satisfied customers
- secure gas and electricity system
- reliable and low emissions energy
- effective development of open and competitive markets
- efficient and timely investment in networks
- strong but agile governance.

We have outlined our overall views on the market performance against these outcomes, the greatest risks, and the actions required and underway to address them.

This year's report is written in the context of recent major developments in the energy landscape:

- The east coast gas and electricity markets experienced an unprecedented crisis in June 2022 involving extremely high wholesale prices, the temporary suspension of the electricity market and the failure of several small retailers. These events highlight many of the challenges we face to successfully implement a secure, reliable and low emissions energy system that is affordable for consumers.
- In August 2022, Energy Ministers announced the vision, principles and key initial priority areas for a new National Energy Transformation Partnership (the Partnership).[2] The Partnership's first action will be to fast-track an emissions objective into the national energy objectives.

We are publishing this report for the first time alongside the AER's annual *State of the Energy Market*. We encourage readers to access the *State of the Energy Market* for more detail on outcomes and key developments across the electricity and gas supply chains.

## Health of the NEM

The health of the NEM is currently facing significant risks arising from the rapid technological and economic transition in the NEM, which have been highlighted by the recent crisis events. Addressing these risks requires massive physical investment and wide-ranging policy reforms. These investments and reforms must be pursued purposefully, urgently, and with an unrelenting focus on cost discipline to meet the affordability, reliability and emissions reduction challenges that are facing the sector.

The energy transition will be bumpy and new challenges will emerge. There are different ways to navigate it. At all times, we should be guided by the best and least-cost pathway that supports the long-term interest of consumers.

In this report, we observe some progress towards the desired outcomes of the Strategic Energy Plan but also major and urgent pressures to keep pace with the energy transition and accelerating retirement of coal-generation.

The energy crisis in 2022 reiterates the importance of the reform program. We urgently need market reform and regulatory settings that encourage efficient investment for our energy future. And the ability to manage the pace of change including the exit of thermal generation.

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[1] The Strategic Energy Plan, developed in 2020, is an overarching framework setting out key priorities—expressed as desired outcomes—measurable objectives for each outcome, an agreed action plan and a governance framework to support it.

[2] National Energy Transformation Partnership, accessed September 2022.

Recent experiences highlight new priorities:

- promoting further resilience in our market design to cope with changing circumstances
- ensuring we have better visibility of, and confidence in, our available energy supplies particularly in times of market stress.

We are optimistic that the Partnership, supported by the ESB and the work of the market bodies, sets an appropriate direction for the changes required. Keeping pace with the transition will require urgent and prolonged commitment by all stakeholders.

We have identified three overarching themes for the most pressing risks.

## Energy affordability is a major concern for consumers

There are currently more upward than downward pressures on energy prices in an environment where consumers already face higher costs of living. Consumers identify this as their greatest concern relating to energy. In addition, if the pressures in the market translate to reduced retail competition, this could also affect consumers' ability to manage costs.

An orderly energy transition remains the best way to improve energy affordability in the long-term. However, this will take time and the required investments will add to cost-pressures, although they will be lower than the costs of a disorderly transition.

Some consumers have access to consumer energy resources (CER), such as solar PV or energy efficiency devices, which assist in managing these short-term pressures. There is much work underway to integrate CER into the NEM, and this is crucial to maximise the value of these resources.

Importantly, some consumers are likely to remain more exposed to the risks and costs inherent to the energy transition. Working to recognise, engage with and provide support to consumers in periods of vulnerability will be essential to deliver a sustainable transition that benefits all consumers.

## Energy markets are tightly interconnected

The energy transition emphasises how tightly our gas and electricity markets are intertwined, for two reasons.

- Gas is important in its own right as a fuel in the NEM. Looking ahead, gas is likely to play a smaller but nonetheless important role in 'gap filling': complementing variable renewable energy, including longer duration periods when other storage options might be exhausted. So, healthy gas markets are necessary for a healthy electricity market.
- Australia's decarbonisation journey will mean we use less gas in other settings. Less gas use means more electricity use. For example, widespread electrification will displace significant gas use, particularly in residential and commercial settings. Where gas use is replaced by hydrogen, the production of hydrogen also requires electricity. Both electricity and gas supply chains, including networks, will be affected by this transition.

Similar considerations apply to liquid fuels: although we are at a very early point in this transition, the displacement of internal combustion engines with either electric or hydrogen vehicles will have large consequences for the electricity system.

Because of these close interactions, planning the future gas and electricity markets cannot occur in isolation. The health of the NEM depends not just on an independently healthy electricity market, but also on having frameworks that support healthy gas markets and efficient interactions between the two. Expanding the scope of the energy system planning will assist to cohesively develop the gas and electricity markets and infrastructure, enhancing the health of both.

## We need urgent and cost-effective investments in transmission, renewable energy and flexible capacity

The NEM requires significant investment in renewable energy, flexible capacity and the transmission network to support them. All Australian jurisdictions have committed to a net zero target and we support the inclusion of an emissions objective within the national energy objectives. A well-designed environmental objective, together with any additional guidance from Government, should enable market bodies to account for the need to achieve emissions reduction goals when making decisions affecting the scale and pace of the transition.

Our best strategy to manage the risk of the transition is to build replacement assets quickly, while still maintaining discipline over costs, in advance of thermal generation retirements. This will reduce our exposure to the shocks of international gas and coal price movements, reduce our reliance on ageing assets and allow consumers to benefit from strongly connected, geographically diverse renewable energy resources.

The 2022 ISP sets out the scale and urgency of transmission investments necessary to support new generation. Our frameworks must evolve to make these investments at least-cost, and we need to find better ways – both within our market frameworks and beyond – to recognise the specific impacts for communities hosting the assets and build social licence. Due to the scale and pace of investment required, we face major coordination challenges relating to land use planning, the availability of skilled workers and supply chain requirements.

The initial priorities set out under the Partnership include accelerating nationally significant transmission, planning for generation and storage adequacy and addressing enabler requirements such as workforce, supply chain and community needs.

The ESB will deliver relevant post 2025 NEM reforms to support these priorities, including transmission access reform and exit management arrangements to mitigate the risks of disorderly exits for coal generation.

# 1. Affordable energy and satisfied customers

Energy affordability is a high priority for consumers and market bodies. The Strategic Energy Plan outlines four objectives to evaluate progress:

- Is energy increasingly affordable for all consumers, supported by adequate consumer protections and access to dispute resolution?
- Are consumers empowered to manage their demand and able to access distributed energy and energy efficiency solutions?
- Can consumers easily identify and secure the best deal for their circumstances?
- Are vulnerable consumers on suitable pricing plans, receiving concessions when needed, and can benefit from distributed energy and energy efficiency schemes?

## Progress

In the short term, consumers will be exposed to energy bill increases and wider cost of living pressures.

Energy affordability had been improving in recent years, but this has been impacted in the short term by energy market shocks intersecting with wider increases in costs-of-living.

Recent surges in wholesale electricity and gas prices are putting immediate upward pressure on retail prices available to consumers. These surges reflect the combined impacts of:

- reduction in thermal generation resulting from unplanned outages and higher costs
- impacts from the ongoing war in Ukraine, which has led to significant pressure on coal and gas prices globally
- extreme weather in NSW and Queensland, which has affected coal supplies and electricity demand
- increasingly 'peaky' demand driving up the cost of hedging for retailers.

In coming years, there are multiple factors that will continue to push up costs: inflation outcomes (e.g. affecting annual network tariffs), global supply chain disruptions, labour shortages, and potential uplifts for the cost of capital (related to higher interest rates) and for other adjustments (related to maintaining social licence). These issues are discussed more extensively in *State of the Energy Market*. In combination, they will pose pressures for affordability.

Costs may decline and stabilise in the medium-term but there are currently more upward than downward pressures in the system.

In the longer term, the reform pathway for the energy transition is designed to deliver net benefits and improve affordability outcomes. To benefit all customers, the retail market must deliver new, innovative products to ensure consumers can respond dynamically to energy prices, helping to optimise both local networks and wider energy markets. There are challenges to engage consumers effectively and many lack the energy or digital literacy or incentive to respond to further complexity in their contracts. We are particularly concerned about vulnerable consumers, renters and others who cannot access many options to control costs such as energy efficiency, demand response or other CER.

Going forward, the implementation of market reforms must be consumer-centric to ensure that the new energy market works for all consumers.

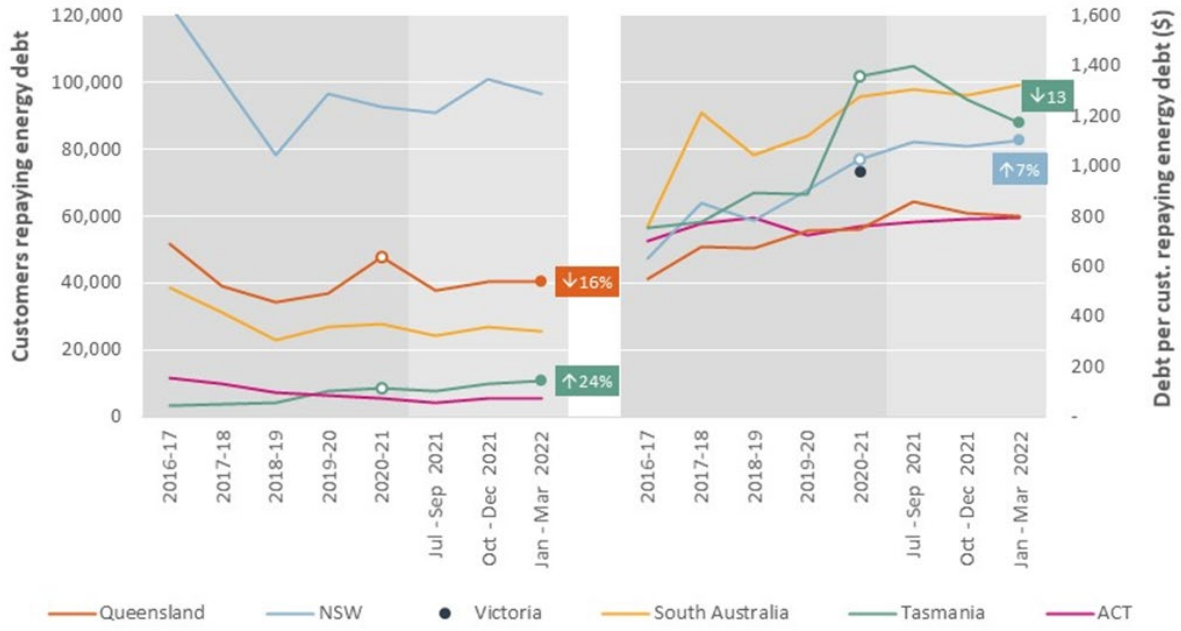
## Key risks and actions to address them

### *Managing energy costs remains the main concern for consumers*

Upward pressure on energy costs will be challenging for many consumers.

Australian wage growth over the year to June 2022 was the highest rate since 2013 but still less than half the headline inflation rate. Energy debt levels have also increased. We expect that recent increases in wholesale costs will translate into higher retail prices over June to October, and that this will create additional debt pressure on customers, particularly those facing hardship.

**Figure 1** **Residential customer debt levels**




*Note: Based on customers with an amount owing to a retailer that has been outstanding for 90 days or more.*

*Source: AER, Retail markets quarterly, Q3 2021–22, June 2022; ESC, Victorian energy market report 2020–21, November 2021.*

In the recent sentiment survey by Energy Consumers Australia (ECA), 80% of households were satisfied with the provision of their electricity services but 45% of households ranked affordable energy as the top consideration with the energy transition.[3]

### *Energy costs and savings are not shared evenly across consumers*

The ability for a consumer to manage energy use is crucial to maintaining affordability, but energy management options such as CER or energy efficient appliances are not accessible to all consumers.

Low-income consumers bear a higher cost burden for energy than other consumers. Firstly, they have a smaller income available to pay for energy costs. Electricity bills as a proportion of income are for low-income earners at least double that compared to average income earners.

Secondly, their energy costs and/or use can be higher than average due to challenges investing in CER or energy efficient home improvements, due to cost or renting. In most states, energy bills are higher for customers in regional and remote areas, where network costs tend to be higher and can be

[3] Energy Consumers Australia, *Sentiment Survey*, June 2022

recovered from fewer customers than in urban networks. These differences are discussed in more detail in the AER's *State of the Energy Market 2022* report.

**Figure 2 Electricity usage amongst different groups of residential customers**


*Source: ACCC, Inquiry into the National Electricity Market, May 2021 report, May 2021*

In addition to concession schemes, some jurisdictions have introduced targeted measures for low-income households to reduce their energy bills, such as the Victorian Household Energy Savings Package, and the ACT's ActSmart Household Energy Efficiency Program.[4]

The shift towards CER and two-sided energy markets also alters the distribution of energy costs across households. Solar PV, batteries and smart appliances offer energy cost savings. However, not all consumers have the means or opportunity to take advantage of the benefits that CER bring e.g. consumers who rent and those who are financially constrained.

Irrespective of financial constraints, consumers may still struggle to engage in the energy market given its complexity. In the ECA's most recent Consumer Behaviour Survey, 42% of Victorian respondents—where smart meters have been installed in up to 99% of residences—acknowledged having a smart meter but did not use it to help control energy costs. A further 33% were either unsure or stated they did not own a smart meter.[5] The ESB's consumer insights work has identified complexity as being a key barrier to consumer uptake of flexibility products and services, contributing to low levels of trust and engagement by consumers.

The ESB remains concerned that the increasing complexities of the changing market will further marginalise some consumers, widening the equity gap in electricity affordability and access. Over the

[4] SA's Retailer Energy Productivity Scheme offers free or discounted energy efficiency and energy productivity activities, but it is not specifically targeted at low-income households.

[5] ECA consumer behaviour survey 2021, results for Victoria https://ecss.energyconsumersaustralia.com.au/behaviour-survey-oct-2021/state-summary-behave-2021/victoria-behave-oct-2021/

long-term, the best means to mitigate this risk is through the provision of affordable electricity to all consumers. Key steps will be the successful integration of CER, reducing demand at key periods at least cost, and targeted measures to identify the causes of inequity and mitigate them. The AER will release its strategy for consumers experiencing vulnerabilities later in 2022, which will include actions for the AER to support consumers and energy businesses.

While the process of CER integration continues, immediate steps are being taken to support consumers:

- The Retailer Authorisation and Exemption Review, led by the AER, is a key initiative as part of the ESB's CER implementation Plan. It considers how risks and harms to customers may be changing from emerging products and services, and whether existing customer protection frameworks are fit for purpose to meet these changing needs
- The AER's first Vulnerability Strategy will inform the AER's work across its roles.

### *To maximise and widen the benefits of CER, immediate work is required on data capabilities and integration of technologies*

The ESB is also progressing a reform pathway focused on the effective integration of CER into the NEM. CER has the potential to benefit all consumers, including those without immediate access to the technologies. Our reform program is aimed and ensuring the integration of CER is optimised at a system-wide level so that:

- demand reductions, especially at peak periods, are maximised—taking pressure off generation requirements and local network constraints; and
- any network investments required to integrate CER are efficient and cost-effective.

The Post 2025 CER Implementation Plan outlines a program of detailed technical and regulatory activities that will be developed and delivered over the next three years. The key objectives include rewarding consumers for their flexible demand and generation, supporting energy market innovation, allowing networks to accommodate CER and manage security as well as providing visibility and tools to the system operator to operate a safe, secure, reliable system. A snapshot of reform initiatives includes:

- The ESB is developing an interoperability policy to support effective implementation of standards for inverters and other technology and devices. These are the foundations to enable customers to take up offers from different service providers and unlock value from CER assets.
- The ESB's Data Strategy recognises data and digital capabilities as critical enablers to the energy transition, to manage new technologies and optimise long term interests of consumers. In the near term, the ESB will unlock barriers to immediate value from data and develop a fit-for-purpose energy data framework that is flexible, principles-based and adaptable to changing needs over time. Priority projects in the short term will focus on enabling better visibility of data to manage electric vehicles (EVs), optimise the low voltage network and ensure effective consumer protections.

The ESB recognises the ongoing challenge of coordinating these complex reforms between the jurisdictions, new and existing market participants, market bodies and customers. The ESB is focussed on developing future arrangements to support demand side and new technologies. They will have increasing value in helping to deliver the necessary capacity and capabilities for our future energy market.

### *Immediate ESB priorities to support this outcome*

Many of the reforms underway are important steps towards improving the market performance against our consumer objectives. Work on consumer protections and CER will help to mitigate challenging economic and market circumstances.

Over the next 12 months, we will deliver:

- the Retailer Authorisation and Exemption review which looks at customer protections in a changing market (led by the AER as part of the ESB's CER Implementation Plan)
- Horizon One reforms outlined in the ESB's CER Implementation Plan and Data Strategy initiatives addressing technical requirements, market changes, system needs, customer protections and initial data reforms and services.

This focus on the consumer, and the ability to adapt the reform program as demonstrated following the recent market crisis, will remain important throughout the energy transition.

# 2. Secure gas and electricity system

The operation of the NEM requires the system to be maintained within defined physical limits, both under normal operating conditions and when there are various electrical faults. The Strategic Energy Plan outlines two objectives to evaluate progress:

- Do markets operate safely, securely and efficiently, under a full range of operating conditions, with minimal intervention?
- Is system planning and development informed by clear and transparent rules?

## Progress

Maintaining system security continues to be challenging and costly as the pace of the energy transition accelerates. However, there is some evidence of positive progress.

In the NEM, the essential system services suite of the post-2025 market design program marks a step towards improved system security. The AEMC is leading consideration of an operational security mechanism as one of a series of rule changes at a system level to improve management of electrical characteristics such as frequency, voltage, system strength and inertia.

In gas markets, system security has been challenged by recent market pressures to the extent that AEMO has recently issued seven 'threat to system security' (TTSS) notifications for the Victorian gas market including directing that gas generators in the NEM sourcing gas from the Victorian market not come on in order to preserve sufficient capacity in the Iona gas storage facility. Besides the specific risks to security in east coast gas markets, this highlights the interacting challenges of closely interconnected electricity and gas markets.

The integration of CER presents additional system security risks and opportunities. Increasing uptake of CER reduces reliance on the grid when it is available. If well-coordinated, this has the potential to support system security. If not, it has the potential to increases the challenges involved in keeping the grid stable. These challenges will be considered as part of the ESB's overall CER implementation plan.

## Key risks and actions to address them

### *System security is challenged by the shift from synchronous generation to inverter-based resources*

Maintaining system security during the energy transition has been a key focus of the market bodies over the 18 months since the last Health of the NEM report.

In a coal, gas or hydro generator, energy is transmitted to the power system by the rotation of a huge shaft, which spins and is synchronised to the power system's frequency. These generators are referred to as synchronous and this property means they contribute to the ability of the power system to remain in a secure operating state. Much new renewable generation, however, connects to the system in a different way, via power electronics. Many system services are provided as a by-product of synchronous plants that are centrally located in the grid. As the synchronous plants age and reach retirement, these services will need to be provided through new mechanisms and technologies.

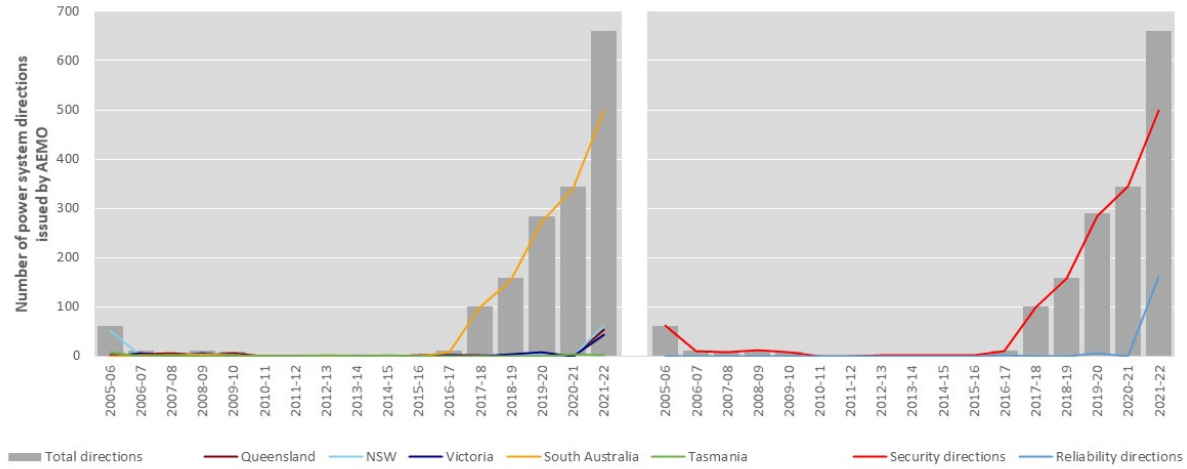
There is substantial ongoing work by market bodies to ensure the energy transition includes managing our changing security needs and that essential system services are provided to keep the power system

secure. A more detailed discussion of these essential system services can be found in AEMO and AEMC's Joint Paper on Essential System Services, Inertia[6] and AEMO's Engineering Framework.[7]

Where system security is at risk, it can result in significant costs arising from system directions.

AEMO uses directions when commercial generation capacity is not available or able to address problems. Figure 3 highlights the growth in directions from 2016 through 2022. These directions were almost exclusively used to manage system strength in SA.[8]

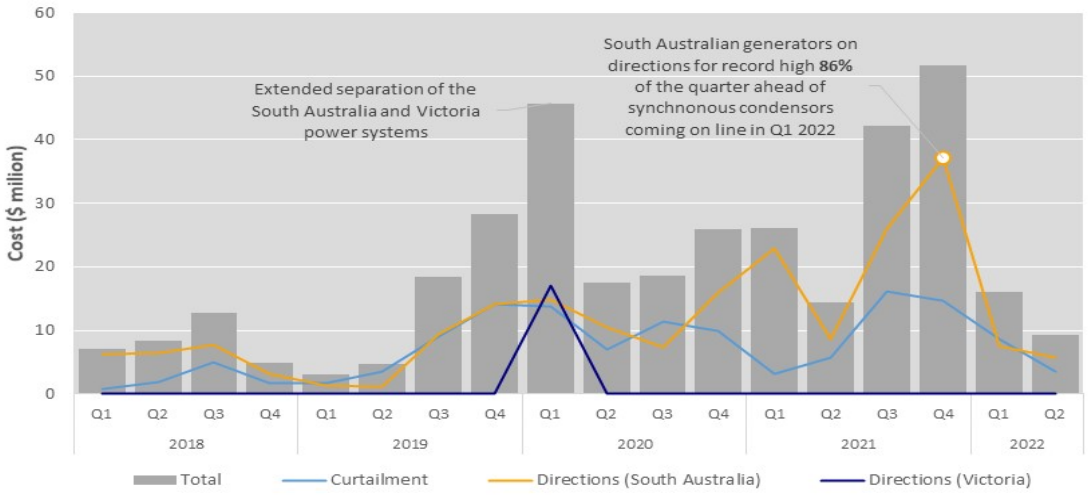
**Figure 3 Security and reliability directions**




*Source: AEMO data*

Until the end of 2021, the SA directions affected four synchronous generator units that were directed on to provide system strength services. Synchronous condensers have been installed and AEMO has only directed two synchronous generator units. Figure 4 highlights the reduced cost of directions over 2022.

**Figure 4 Costs of directions since 2018 excluding RERT**




*Source: AEMO data*

6 AEMC and AEMO, Essential system services and inertia in the NEM, June 2022.

7 AEMO, Engineering Framework.

8 RERT directions relating to reliability increased significantly in June 2022 before the suspension of the NEM.

Going forward, some continuing directions are expected to address system security issues in SA while AEMO develops its approach to managing system security without the use of synchronous generators.

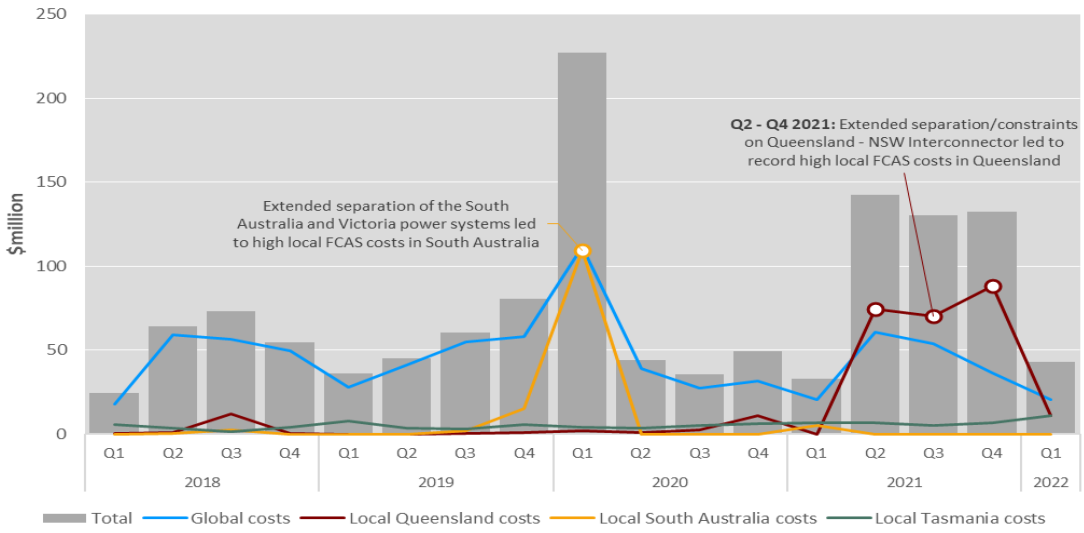
### *There are longer-term risks of localised high FCAS costs*

AEMO can procure frequency control ancillary services (FCAS) through the NEM to maintain key technical characteristics of the system. FCAS costs are ultimately borne by consumers through their retailers. However, there are few tools available to retailers to manage the risk of volatility in these costs in the same way that they do for wholesale energy costs. This means a sharp increase in FCAS costs can lead to significant and unexpected increases in electricity bills.

Batteries such as Hornsdale Power Reserve and virtual power plants (VPPs) have been successful in providing FCAS to replace thermal plant exits. Mandatory primary frequency response requirements have increased the security of the power system by increasing its resilience to frequency excursions, and have reduced the need for AEMO to procure additional frequency control services. The introduction of a very fast FCAS market will further support least-cost procurement of FCAS services.[9]

Despite these positive developments, there is an ongoing risk of further local FCAS costs in the event of planned and unplanned network outages shutting off access to FCAS services from different regions. Since 2018, there have been three significant spikes in local FCAS costs.[10] Figure 5 highlights the impact of high local FCAS costs in Queensland over 2021. These local FCAS costs were a factor contributing to increases in South-East Queensland default market offer (DMO) prices for 2022-23.[11]

**Figure 5 FCAS costs since 2018**




*Source: AER analysis*

Further augmentation of the network, including upgrades to interconnectors etc, may help improve system security in the longer term but in the meantime will likely continue to create long outages and extended periods of reliance on local FCAS services. Costs imposed on consumers should be factored early into planning network outages, so that local FCAS can be sourced relatively cheaply and efficiently.

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9 AEMC, Final determination: Fast frequency response market ancillary service rule, July 2021.

10 The first two spikes in 2020 were triggered by network outages reducing access to FCAS services from other regions. The third spike in 2021 occurred in QLD, driven by the upgrade to QNI leading to local FCAS requirements and record FCAS costs of $89m for Q4 2021. For a detailed description, see AER's Wholesale Quarterly Report Q4 2021.

11 AER, Default market offer prices 2022–23: Final determination, May 2022.

### *Recent reforms will contribute to providing essential system services at least-cost to consumers*

The ESB's work on essential system services has focused on establishing new markets or other methods to procure system services at least cost to consumers.

Rule change proposals have included:

- creating fast frequency response markets and incentivising primary frequency response. The implementation of the mandatory primary frequency response has resulted in vastly improved and stable frequency. Since the commencement of this reform, the number of excursions outside of the normal operating frequency band has significantly dropped and the frequency has remained closer to the 50 cycles per second requirement.
- requiring TNSPs to proactively forecast and procure system strength services and supply them as part of their prescribed transmissions services, while incentivising new connecting inverter-based resources to reduce their "consumption" of system strength.
- designing an operational security mechanism to procure, schedule, and dispatch resources in operational timeframes to provide essential system services and maintain system security.

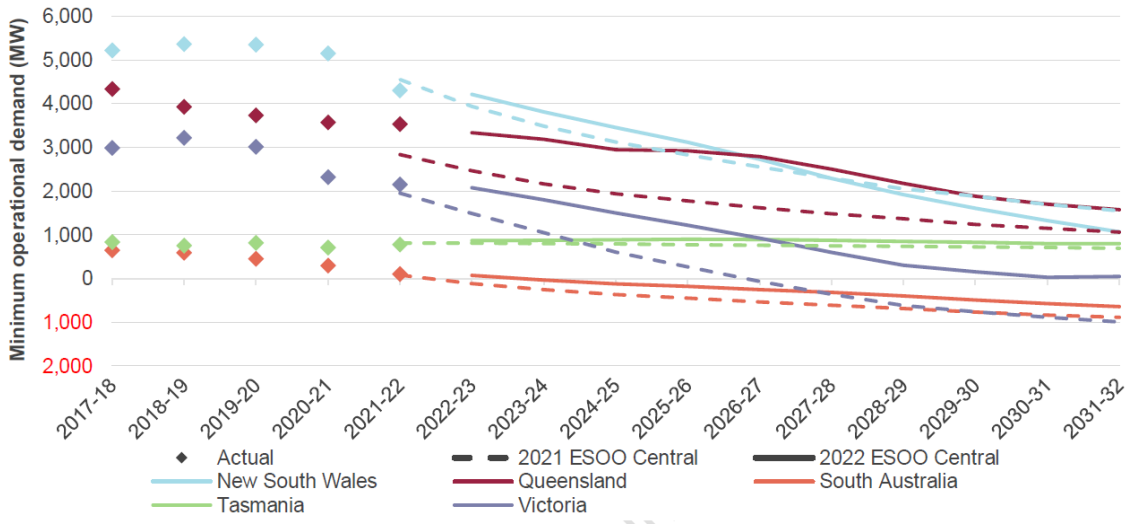
Work continues to embed the rule changes into NEM systems, as well as exploring further reform mechanisms for other system services. This includes a potential operating reserve market, and considerations on inertia.

### *Low visibility of CER creates some risks*

The growth of CER provides significant opportunities for potential new sources of system services (for example, through flexible use of residential batteries). However, it may also pose some longer-term challenges to system security.

This is because of 'minimum demand' periods during the day and the lack of visibility and control over CER by AEMO compared to centralised generation, all of which makes the system more difficult to operate. Figure 6 sets out AEMO's projections of minimum operational demand.

**Figure 6 Regional annual actual and forecast 50% POE minimum operational demand (sent-out), 2022 ESOO Central and 2021 ESOO Central scenarios, 2017-18 to 2031-32**




*Note: The actuals displayed are not weather-corrected or adjusted for system events and exclude DSP. Also, the 2022 ESOO uses the Step Change scenario as its Central outlook, compared to the Progressive Change scenario used in the 2021 ESOO*

*Source: AEMO, Electricity Statement of Opportunities 2022.*

By 2025, AEMO forecasts that there will be periods where distributed solar-PV supplies up to 70-80% of underlying customer demand in mainland-NEM regions. At present, there is no ability to actively manage these resources except in South Australia.[12] If no action is taken, with the present operational tools it has available, AEMO will struggle to deliver minimum requirements for essential system requirements including system strength, inertia, voltage management and frequency control.

Some forms of CER have also been found to disconnect *en masse* from the power system during power system disturbances, exacerbating system instability. Technical standards for CER have been updated to address this, but AEMO has identified that only approximately 35% of new installations are being installed correctly in compliance with the new standard.[13] The AEMC will be reviewing compliance with inverter standards as part of assessing the NEM's progress adopting standards already introduced in the NER as part of its work on governance of CER technical standards.[14]

### *Immediate ESB priorities to support this outcome*

Maintaining system security continues to be challenging and costly but work is underway at a system level to address the issues.

Over the next 12 months, we will deliver (via the AEMC and AEMO):

- a final determination on the operational security mechanism that considers a mechanism to value, procure and schedule system security services
- the implementation of the primary frequency response (PFR) incentives rule change which includes a revised frequency performance payments process
- a revised frequency operating standard by April 2023 in order to start new fast frequency response (FFR) market ancillary service arrangements in October 2023
- next steps in response to the joint AEMO/AEMC paper on inertia considerations.

The ESB recommended to Energy Ministers in 2021 that these actions should continue to progress as rule changes led by the AEMC. The ESB monitors their ongoing progress.

12 AEMO, 2021 Electricity Statement of Opportunities, August 2021, Section 6.1.

13 AEMO, Power System Frequency Risk Review, July 2022, Section 3.3.1.

14 AEMC, Rule Determination National Electricity Amendment (Governance of Distributed Energy Resources Technical Standards) Rule 2022; National Energy Retail Amendment (Governance of Distributed Energy Resources Technical Standards) Rule 2022., March 2022.

# 3. Reliable and low emissions energy

The NEM should enable delivery of reliable and low emissions energy. The Strategic Energy Plan outlines two objectives to evaluate progress:

- Do electricity and gas sectors efficiently deliver at least their share of emissions reduction target/s while ensuring reliable supply?
- Do investors efficiently manage risk to support investment, operation, retirement and innovation decisions?

## Progress

The recent energy crisis in June 2022 presented significant challenges to reliability and system security. A number of factors influenced NEM regional prices and the trigger for the market suspension.[15] The market came very close to customer load shedding but it was avoided through AEMO's directions and other measures.[16] While unserved energy (USE) was avoided, the requirement for those directions will be costly and ultimately passed to consumers.

There are some positive signs for long-term reliable and low emissions energy.

Through the Partnership, Ministers have committed to fast-tracking an emissions objective into the national energy objectives. This will explicitly and enduringly tie the need for low-emissions energy with the overarching framework governing the functioning and regulation of energy markets.

As of 2021, Australia was on track to exceed its 2030 emissions reduction target (26% to 28% emissions reduction below 2005 levels).[17] According to preliminary analysis, Australia's recent update to its 2030 nationally-determined contribution (43% emissions reduction below 2005 levels) appears closely aligned with the Step Change scenario.[18] This forecast includes an almost doubling of today's consumption by 2050 as consumers switch to electricity from other energy sources as a more effective pathway to decarbonise. The 2022 emissions projections are under preparation including the role of the NEM to deliver its portion of the revised carbon budget.

The potential scope of investment, if encouraged, is positive. In July 2022, AEMO forecast that the new generation pipeline is over 2.5 times the existing capacity of the NEM. This represents a 40 per cent increase in the overall generation pipeline compared to projections in August 2021.[19] The majority of this pipeline comprises low emissions solar, wind and hydro generation.

If coordinated efficiently, there is also great potential for CER and demand-side response to meaningfully support reliable and low emissions energy. In 2021, residential solar PV accounted for 8 per cent of total energy consumption in the NEM. Recent changes, such as the introduction of wholesale demand-response, equip consumers to offer and be rewarded for reducing their load during peak periods.

Nonetheless, most of the change to the extended generation pipeline is not yet committed. The NEM faces accelerated coal retirements, and gas-shortfalls affecting the most important current sources of flexible generation. With the NEM expected to experience a cluster of five announced coal-fired

15 Analysis provided by AEMO, NEM market suspension and operational challenges in June 2022, August 2022, p.11

16 Ibid, p.4

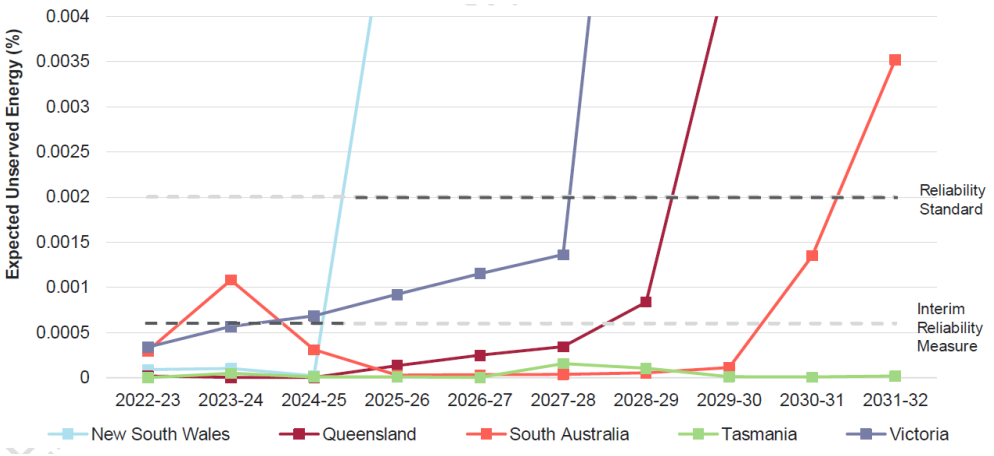
17 https://www.dcceew.gov.au/climate-change/publications/australias-emissions-projections-2021

18 AEMO, ISP 2022, June 2022, p.23

19 AEMO, *Electricity Statement of Opportunities*, August 2021

generator retirements in the next decade, and needing resilience for potential future closures as well, the investment need is pressing and widespread across the NEM. Figure 7 shows forecast reliability shortfalls in all NEM mainland regions as we approach 2030 (on the basis of committed generation and transmission investment).

**Figure 7 Expected unserved energy, ESOO Central scenario, 2022-23 to 2031-32 (%)**




*Note: Since the modelling of the ESOO was conducted, the Mortlake South Wind Farm (approximately 160 MW) has become committed in Victoria. Inclusion of this project in the ESOO modelling would reduce forecast reliability risks in Victoria from 2022-23.*

*Source: AEMO, Electricity Statement of Opportunities, August 2022*

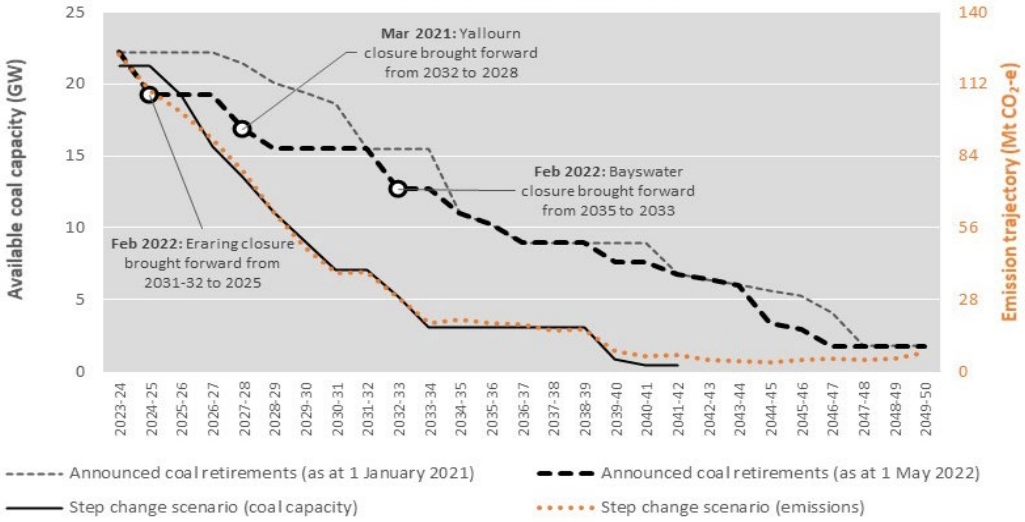
## Key risks and actions to address them

### *Disorderly coal exit would compromise reliability*

Since January 2021, Eraring, Yallourn and Bayswater coal-generation facilities have announced earlier than expected retirement dates. The NEM now expects five coal-fired generator retirements in the next decade, including the remaining units of Liddell Power Station (NSW—April 2023), Eraring Power Station (NSW—August 2025), Callide B Power Station (QLD—2028), Yallourn W Power Station (Vic—2028) and Vales Point B (NSW—2029).

Figure 8 shows the announcements have partly reduced the window between AEMO's forecast of coal retirements in the ISP (step change scenario) and the intended retirements as publicly announced.

**Figure 8 Forecast coal retirements and links with emissions**



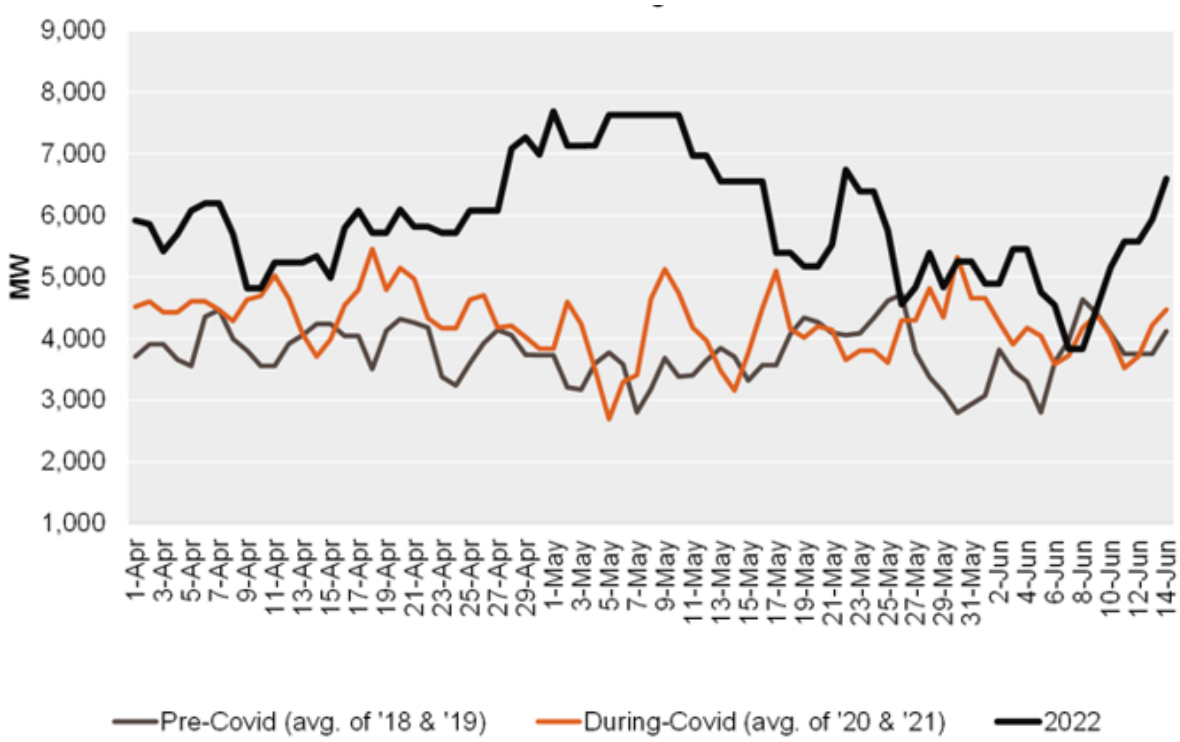

*Source: AER analysis*

Figure 8 suggests that coal requirements are coming into alignment with the central scenario being used for planning. If enabling reform and investment proceeds on schedule and new generation investment proceeds at the required rate, there is time for the orderly replacement of coal generation. However, if retirements accelerate or if there are delays in enabling reform and investment, there is a growing risk of reliability gaps and a disorderly transition.

In particular, as coal generation approaches its anticipated exit, units will become less reliable without considerable maintenance expenditure. It is vital that ageing thermal generators face the appropriate incentives to maintain generation units until they can exit on an orderly timeline.

Figure 9 highlights a recent increase in scheduled and unscheduled coal generation outages. As set out in greater detail in *State of the Energy Market*, these outages were a major driver of recent increases in wholesale prices.

**Figure 9 Coal and baseload gas outages up to suspension of the NEM**




*Note: Includes Swanbank E in Queensland*

*Source: AER analysis, NEM data*

On 1 September 2022, the Reliability Panel provided its final report to the AEMC on the reliability standard and settings (RSS). For the review period, 1 July 2025 to 30 June 2028, it recommends retaining the existing form of the reliability standard expressed as a percentage of expected USE and the current level of the reliability standard at 0.002% expected USE. The report recommends adjustments to the market price cap, cumulative price threshold and administered price cap. These standards and settings play an important role in stabilising markets during shocks and, if calibrated properly, should encourage investment in generation or demand response capacity while protecting the market from risk. The recommendations and modelled results will provide a useful input to inform the ESB's work.

The AEMC has separately started consultation on a rule-change proposal in support of a temporary increase of the administered pricing cap from $300/MWh to $600/MWh. The rule change proposes a

temporary increase in the immediate future with a sunset period of 12 months (or a suitable period as determined by the rule change process).

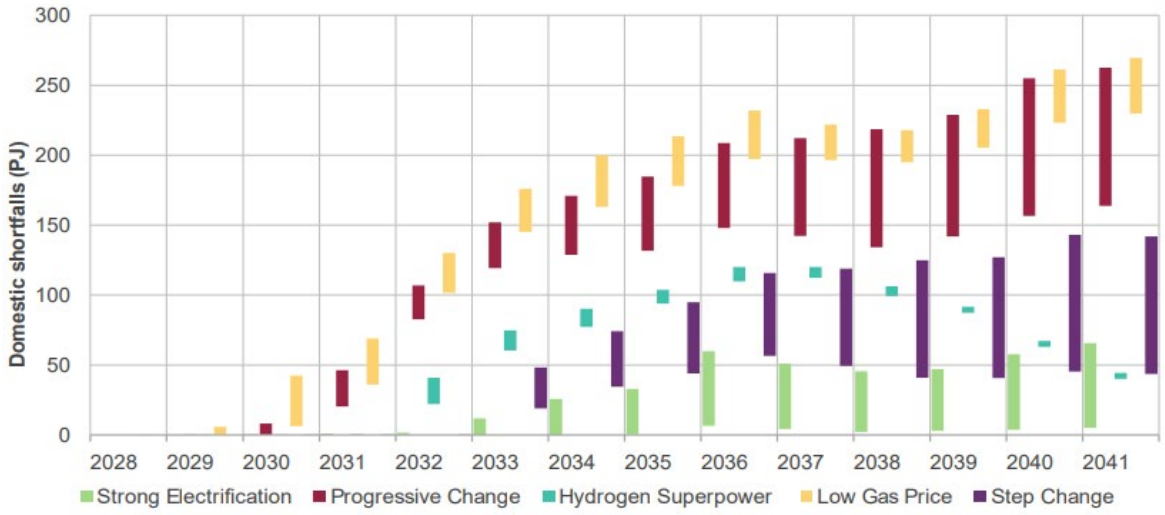
### *Gas shortfalls could exacerbate reliability challenges*

New sources of flexible generation must replace coal to meet demand in daily peak periods and when renewable output is low. Without significant increases in non-thermal storage and demand response, gas will likely power flexible generation in the medium term. The Step Change scenario forecasts a continued role for gas in the longer term with up to 10GW gas powered generation capacity by 2050.

AEMO in its Gas Statement of Opportunities (March 2022) and the ACCC in its gas inquiry interim report (July 2022) have both forecast risks of supply shortfalls in 2023.[20]

We anticipate medium term gas shortfalls as southern gas reserves deplete. Assuming production from existing, committed and expected projects, AEMO forecasts domestic shortfalls from 2029 of varying materiality depending on the range of weather and demand. The ACCC also forecast a possible shortfall from as early as 2023 in its July 2022 report.[21]

**Figure 10** **Range of domestic annual supply gaps forecast under different scenarios, with existing, committed, and anticipated developments, all scenarios, 2028-41 (PJ)**




*Source: AEMO, Gas statement of opportunities 2022*

Shortfalls could constrain the availability of gas generators and/or lead to higher prices. Illustrating this risk, AEMO issued seven TTSS notifications for the Victorian gas market in 2022, including directing that gas generators sourcing gas from the Victorian market not come on in order to preserve sufficient capacity in the Iona gas storage facility. These shortfalls pose direct risks to gas system security where inventory at storage facilities falls below the minimum levels necessary to support gas flow from those facilities. Curtailments of this sort ultimately then restrict flexible generation available in the NEM, highlighting the challenges associated with closely interconnected markets.

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[20] The ACCC forecasts a probable shortfall of 56 PJ where AEMO's forecast indicated a risk of shortfalls on peak days but sufficient gas available to meet annual demand. The sources of these differences are discussed in: ACCC, Gas inquiry 2017–2020, interim report, January 2022, February 2022, p. 19.

[21] ACCC *Gas inquiry July 2022 interim report* (1 August 2022)

Energy Ministers have committed to a further series of measures to support gas availability. These include:

- Extensions to AEMO's powers, allowing it to provide it with tools to manage supply shortfalls in the east coast market in winter 2023—this includes submitting an urgent rule change to allow AEMO to contract for gas storage at the Iona facility.
- Instructions for AEMO to develop an annual Winter Readiness Management plan for east coast energy markets and incorporation of gas supply and system adequacy risks into its annual Summer Readiness Plan.

### *We need a firming capacity framework to support reliability through and beyond transition*

Energy Ministers have committed to take more active control of the work to ensure firming capacity is in place as the system evolves and to manage the risks of disorderly exit of coal generation. Ministers have instructed Senior Officials to propose a capacity framework that delivers adequate capacity, ensures orderly transition, and incentivises new investment in firm renewable energy to ensure the system can meet peak demand at all times.

The ESB will support this work, and has Identified and implemented complementary measures to support reliability, including:

- improvements to the quality and transparency of information that is collected and published about the future availability of generators as part of the medium-term projected assessment of system adequacy (MT PASA) process (published August 2022)
- an amendment to the retailer reliability obligation (RRO) to allow Ministers to trigger a T-3 reliability instrument if there is a real risk that the supply of electricity will be disrupted (submitted to Energy Ministers for approval).
- a rule change that will allow AEMO to enter multi-year contracts under the interim reliability reserve until it expires on 31 March 2025.
- scope for a jurisdictional strategic reserve, as a practical and immediate action that jurisdictions can take in advance of an enduring firming mechanism, making use of the existing short term RERT panel.

### *Immediate ESB priorities to support this outcome*

Over the next 12 months, we will deliver:

- support to Senior Officials to develop a capacity framework
- detailed design options for orderly exit arrangements to manage retiring thermal generation.

# 4. Effective development of open and competitive markets

The Strategic Energy Plan includes four objectives to evaluate this outcome:

- Are wholesale and retail markets competitive and are they delivering efficient outcomes for consumers?
- Are the financial markets for electricity and gas related services deep, liquid and transparent?
- Is there access to efficiently priced fuel and transport?
- Are there incentives for innovation to enable value from new technologies?

## Progress

In previous Health of the NEM reports, we have been positive about the development of open and competitive markets. This includes ongoing increased liquidity in gas day ahead markets and the resilience of retail competition through the ongoing impacts of COVID.

The imminent commencement of a regulatory sandboxing framework will also help innovators testing and providing new services or technologies.

On balance, however, recent market shocks have set back progress:

- Tight international coal and gas markets have imposed significant pressure on domestic energy prices. This is likely to persist over a number of years.
- Volatile spot prices have significantly exceeded levels forecast in hedging contracts. This has resulted in material short term cash-flow impacts on generators. Ongoing high wholesale prices could lead to fewer parties being willing to contract. In the longer-term, having more exposure to volatile spot-market outcomes would likely place pressure on retailers without generation assets to compete.
- Periods of low renewable energy availability have highlighted the importance of flexible dispatchable generation capacity in a market that increasingly relies on intermittent generation. Ownership of these flexible generation assets remains concentrated.

Electricity and gas markets have both recently required a series of extraordinary interventions. Amongst other steps, AEMO has:

- suspended the NEM over 10 days in June 2022
- twice conducted industry conferences under the east-coast wide Gas Supply Guarantee mechanism, to ensure adequacy of gas supply in following days
- conducted a contingency gas conference for the Sydney Short Term Trading Market on 25 May 2022
- issued seven TTSS notifications for the Victorian gas market including directing that gas generators sourcing gas from the Victorian market not come on in order to preserve sufficient capacity in the Iona gas storage facility.

Specific interventions have helped to stabilise the markets at critical junctures and avoid load-shedding. Nonetheless, they highlight challenges of the accelerating transition. We will likely face other market shocks as we transform our generation fleet and interact with global fuel pressures. A properly calibrated and predictable framework of interventions will play an important role in market resilience going forward.

## Key risks and actions to address them

### *Record-high international fuel prices puts pressure on domestic fuel availability and prices*

Over 2022, international coal and gas prices have reached record high levels reflecting an overlapping set of domestic and international drivers.

Futures markets suggest these high commodity prices are likely to persist until at least 2024. This exerts pressure on domestic fuel availability and price. Where domestic suppliers of coal or LNG have flexibility to do so, they face strong incentives to sell into the export market. This increases price pressure on any fuel required through spot-markets.

Electricity prices are expected to follow a similar profile in the NEM. Based on futures markets, prices are expected to gradually subside through to 2024 and stabilise above the low levels of 2021 and recent years.

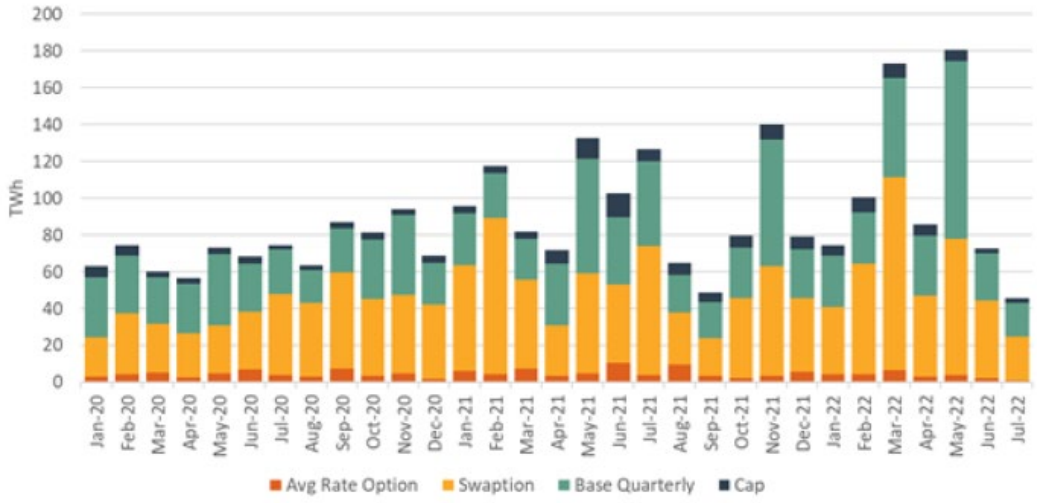
### *High and volatile prices may reduce incentives for generators to offer hedging contracts*

Spot markets and contract markets are important complements to support competition. Liquid contract markets allow generators and retailers to manage cost exposure and insulate consumers from transient high prices.

In previous Health of the NEM reports, we had observed improved contract market liquidity, growing numbers of retailers in the market and declining market share among the big-3 retailers. Recent volatile spot prices have contributed to major cash-flow impacts on market participants through contract markets. Short-term cash-flow requirements to meet daily margins are amplified by the impacts of high fuel prices. To date, this has primarily affected generators with contracts at prices well below the unprecedented spot prices.

Once these contracts lapse, there is significant risk of lower contract market liquidity at reasonable prices. Generators that have been impacted by high and volatile market prices exceeding previous contracting may be less willing to offer contracts at competitive prices. Retailers, in turn, may be reluctant or unable to contract at current high prices and may wait in the hope that contract prices will decline. As set out in Figure 11, we have observed lower ASX trade in contracts over June and July with large proportional reductions in cap contracts that protect market participants from high prices.

**Figure 11 Volumes of ASX contract trades indicate declining contract market liquidity**




*Source: ASX data, AER analysis*

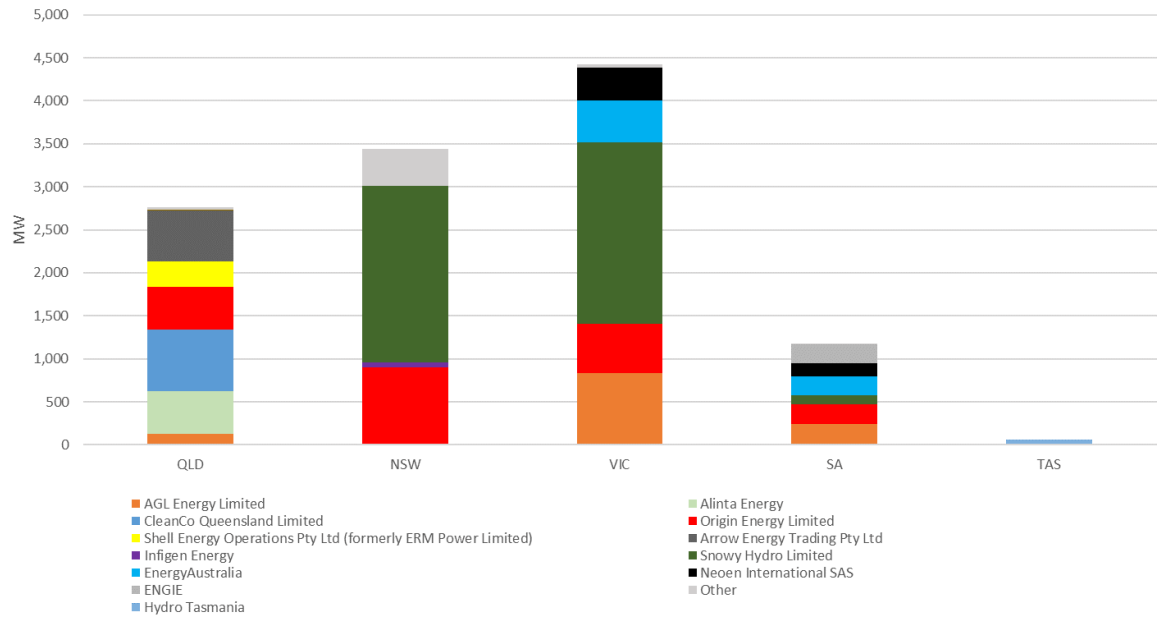
If hedging contracts are not available at profitable levels, retailers without generation assets may be unable to sustainably compete. If this contributes to retailer failure, it is vital that failure be as orderly as possible to minimise disruption for consumers, and to support the resilience of the retailers of last resort (ROLRs) that those consumers are transferred to. In support of this, the AEMC recently revisited the ROLR scheme in the context of supporting market resilience. It made a series of recommendations which Ministers have adopted and agreed to progress the legislative requirements. The AEMC is also reviewing whether the contracts of a failing retailer can be transferred to the ROLR.

As spot prices decline and short-term pressures ease, it is possible that contract market liquidity returns to its medium-term path of improvement. This will be critical for the prospects of efficient and competitive retail markets.

### *Flexible generation capacity is concentrated amongst a small number of owners*

Transient high prices reflective of scarcity are features of an efficient and competitive market. Nonetheless, our recent experience highlights the risk of inefficiencies arising from market concentration in flexible capacity. There has been material investment in new renewable generation, but flexible capacity remains highly concentrated when those renewables are not available. As shown in Figure 12, this concentration is most acute in New South Wales and Victoria.

**Figure 12 Market share by registered flexible capacity**




*Source: AER analysis*

*Note: Flexible capacity in this chart captures all generation defined as 'fast' by start type.*

Greater concentration increases the potential for inefficient market outcomes, either through potential exercise of sustained market power or exposure to the supply, planning or strategies of individual participants. These inefficiencies can cause major market impacts if intermittent generation output is low over an extended period.

### *Enhanced visibility of contract markets will improve our risk analysis and response*

Energy Ministers are progressing consultation on potential reforms to expand the AER's information gathering powers including broader access to contract information. This will enable better monitoring

of participant behaviour to support the AER's compliance and enforcement activities. It will also improve insights into contract market dynamics so that emerging risks will be evident earlier.

The biennial *Wholesale Electricity Market Performance Report*, due out in December 2022, will investigate the competitive structure of the NEM in more detail. This will equip us to form a more developed view about whether the capacity for market power exists and whether participant conduct suggests that participants are exercising market power. It will also enable us to identify impediments to competition and efficiency, and make recommendations about any further structural change that may be required.

### *We need to build market resilience for electricity and gas*

The creation of the Partnership recognises the importance of a considered reform agenda for the medium to longer term, to position the sector to be more resilient and able to navigate future global or domestic challenges.

Major events in the gas and electricity markets are interconnected. As coal capacity exits the market and gas supplies in Victorian production facilities decline, this connectedness is likely to persist if not strengthen. Ministers have prioritised a series of reforms to improve the flexibility and liquidity of domestic gas markets when responding to demand and supply shocks.

More broadly, recent challenges have also highlighted the value of better long-term insights into fuel availability supporting gas, coal and hydroelectric generation. Transparency regarding energy availability will be important in supporting market resilience. Recently, fuel shortages affecting coal generation in the NEM, cascaded into greater pressure on gas-fired generation to run at a time when international fuel prices were already exerting upward pressure on domestic gas prices.

The recently enacted Gas Market Transparency Measures bill is also a positive development towards greater transparency of fuel supply that will be available from September 2022:

- AEMO will have enhanced information gathering powers to make sure the gas statement of opportunities is based on high-quality input information, complemented by the AER commencing a new role to report on gas reserves assumptions
- AEMO and the AER will collect and report a wider set of information on the export, reserve, storage, and domestic sale and swaps of gas.

The ESB is also undertaking analysis and considering recommendations for jurisdictions to consider harmonising the three compensation arrangements in the NEM; administered pricing period compensation administered by the AEMC, directions compensation administered by AEMO, and market suspension compensation administered by AEMO. Appropriate thresholds are an important measure in promoting market resilience. Set properly, these thresholds balance the role of transparent and predictable interventions at times of market disruption with sending the right incentives for generators to offer into the market. The harmonisation is intended to minimise scope for confusion and inconsistencies and achieve efficiency savings to the market bodies in aggregate.

### *Immediate ESB priorities to support this outcome*

Over the next 12 months, we will deliver:

- policy advice on the harmonisation of compensation arrangements.

As needed, the ESB's priorities will be informed by insights and analysis from AEMO's recently enhanced information gathering powers, and supported by the AER's monitoring.

# 5. Efficient and timely investment in networks

Efficient and timely investment in networks is vital to the energy transition. The Strategic Energy Plan outlines three objectives to evaluate progress:

- Are investment solutions optimal across all resources?
- Is regulation of monopoly infrastructure efficient?
- Do the networks have incentives to be efficient platforms for energy services?

## Progress

There are some positive indicators. Network investment has continued at a relatively steady pace. Electricity networks and fully-regulated gas networks are subject to a well-established incentive framework to minimise costs.

Networks have continued to generate profits under the regulatory framework while costs to consumers have declined. We anticipate upward cost pressures over coming years as higher inflation and, if recent capital market trends continue, higher costs of capital feed into network revenue requirements.

The greatest challenge in relation to networks is the timely and least-cost delivery of major transmission projects that will support the changing generation mix. The projects are large and complex. They are and have been prone to delays and cost-increases through planning and approval stages. They are taking place in an environment of emerging upward pressures on network costs—including domestic and global inflationary pressures and signs that the costs of raising capital are rising. Nonetheless, as the exit of coal generation accelerates, it is increasingly urgent that these projects progress.

This expenditure must also be supported by access reform to ensure generators get clear signals to connect into the right parts of the network. Reforming access has proven complex and contentious over several years, but it is vital to make the most efficient use of these transformative investments.

The initiatives proposed through the Partnership have the potential to relieve key impediments. The AEMC's transmission investment and planning review is also underway. It is examining potential improvements to the frameworks for planning, funding and delivering major transmission projects.

## Key risks and actions to address them

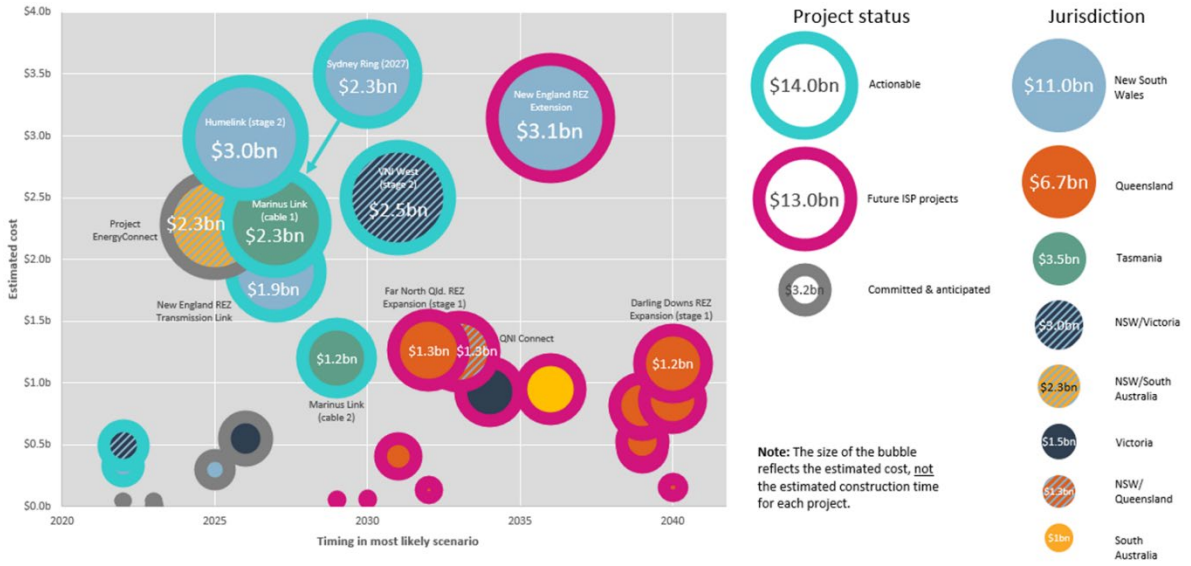
### *Essential transmission investment has been slower and more costly than planned*

Under the optimal development path in the 2022 Integrated System Plan (ISP), AEMO forecasts we require approximately $30 billion of expenditure out to 2050, of which:

- $14 billion is already actionable—meaning the project should be delivered to its earliest schedule and triggering a Regulatory Investment test for Transmission (RIT-T)
- $3.2 billion is committed and anticipated; and
- $13 billion has been identified for future ISP projects.

The scope of required network investment would increase materially if Australia pursues significant development of hydrogen as a domestic fuel source or export commodity.

**Figure 13 Required network investment under the optimal development path**




*Source: AER analysis, AEMO, 2022 Integrated System Plan.*

A range of material risks impact the timeliness and cost-effectiveness of investments, including:

- Cost pressures—These are major projects sensitive to a range of cost inputs and are taking place in an environment of rapidly escalating costs. These costs are all borne by consumers over the lives of the assets. We have already observed material increases in forecast costs through planning stages, and inflationary pressures will likely exacerbate this.
- Delays and timely decision-making processes—The approvals process for the development of the ISP and subsequent regulatory investment tests is rigorous so that only efficient investments will progress to delivery. However, they are also lengthy. Combined with other delays that projects of this scale are subject to, this increases the risk that projects do not proceed on schedule.
- Supply chain risks—Projects of this scale are sensitive to domestic and global supply chain risks. Due to the overlapping timelines for these projects, they will compete for plant, skills and resources. Challenges in accessing or coordinating these necessary inputs could increase both the costs and time required to complete projects.
- Building and maintaining social licence—Hosting major transmission assets has social and environmental impacts on landholders and communities. It is vital that those key stakeholders are able to trust development processes and be involved in decisions affecting them. Failure to do so will impede the timeliness and cost-effectiveness of investments.

## *Key policy and reform work has been initiated*

Ministers recognise the national significance of these projects and have engaged with the risks. The Partnership proposes that it will:

- Identify and declare transmission of national significance (including the actionable projects in the Integrated System Plan - Marinus, VNI West (via Kerang), and Humelink) to accelerate the timely delivery of these critical projects and ensure better community consultation.
- Start work on a co-designed First Nations Clean Energy Strategy with First Nations people to help drive the energy transformation.
- Develop detailed integrated energy infrastructure and regional planning scenarios; and
- assess the workforce, supply chain and community needs associated with the pipeline of transmission, renewable energy, storage and industry development opportunities. This will

inform work on risks and opportunities and identify community engagement needs to support a national action plan on these issues.
- Recognise the role electricity networks and demand side participation will play in delivering the energy transformation.

To support this work, the AEMC is leading a *Transmission Planning and Investment Review* with the market bodies. It has identified a range of issues affecting the timely and efficient delivery of transmission investments. This includes consideration of whether current mechanisms to build and support social licence remain fit for purpose. Regulatory changes are in the process of design and development to ensure the framework is fit for purpose to support the efficient and timely delivery of major projects.

The materiality of the anticipated transmission work presents challenges for the existing incentive framework due to the greater challenges in forecasting capital costs for specific, large and complex projects. The AER has recently commenced a review on expenditure incentive schemes to ensure they are fit for purpose in this context.

### *Access reform is vital for efficient transmission investment*

Efficient transmission investment relies on efficient decisions for the location of generation, storage and demand side resources connecting to the networks. Some congestion is a normal feature of an efficient network. The ISP is not designed to remove all congestion where the benefits exceed the costs. Nonetheless, excessive congestion creates needless costs and risks, specifically:

- Generation investment is riskier than is necessary.
- Storage and demand side resources are not paid to alleviate congestion.
- Consumers face high costs for inefficient or avoidable investment in transmission infrastructure.

It is vital that generators, storage and demand side resources face appropriate signals regarding the costs and impacts of congestion.

Energy Ministers have asked the ESB to expedite its work to introduce new congestion management models. This complements the work underway by jurisdictions to establish Renewable Energy Zones (REZs) and coordinate transmission and generation investments.

### *There remains uncertainty about the long-term use of gas pipelines*

Decarbonisation and electrification will impact gas distribution and transmission pipelines in different ways. In many cases, those same pipelines are undergoing material programs of replacing ageing assets. There is a potential risk of incurring significant investment costs with a falling customer and demand base.

A long-term strategy is needed to guide policy, planning and electricity and gas network investment. The AER has released a paper on '*Regulating gas pipelines under uncertainty'* to canvas some of these issues as it relates to the fully-regulated pipelines, which are predominantly distribution pipelines serving significantly residential customer bases.

Many of the same complex investment and pricing questions also apply to other vital pipelines not currently covered within the full-regulatory framework and where pipeline owners have relatively more scope to exercise market power.

In March 2022, Energy Ministers agreed to a package of changes to the National Gas Law and Rules that, when enacted, will simplify the framework of pipeline regulation, improve transparency for users of those pipelines and provide a more effective constraint to the exercise of market power. In

combination, these changes should contribute to more efficient regulation of the pipelines and ultimately more efficient investment outcomes.

As part of this initiative, the AEMC has recommended changes to rules that will support the development of a decarbonised gas sector by allowing hydrogen blends and renewable gases to be safely supplied through the existing distribution systems.[22] AEMO is leading work to amend the Procedures and other AEMO-made instruments required for settlement and metering in the facilitated and regulated retail gas markets.[23]

The reforms aim to provide regulatory certainty to support investment in innovative projects that will reduce emissions in gas networks. The reforms will also ensure existing regulatory provisions and consumer protections will work as intended when hydrogen and renewable gases are incorporated into the gas network.

### *Immediate ESB priorities to support this outcome*

Efficient and timely delivery of major electricity and gas transmission projects is needed to support the transition. We need generation, storage and flexible load to face the right incentives to manage congestion. A lack of timeliness, social licence concerns and increasing costs of transmission projects pose significant risks to the transition. Many of the factors driving these risks are external to the NEM so a collaborative approach is required to addressing them.

Over the next 12 months, we will deliver:

- the final determination and detailed design of a proposal to address congestion management
- the transmission planning & investment review which will propose solutions for near term and long-term issues including options for contestability (led by the AEMC as one of the ESB's recommendations to Energy Ministers in 2021).

22 https://www.aemc.gov.au/news-centre/media-releases/aemc-publishes-final-report-hydrogen-and-renewable-gas-review

23 https://aemo.com.au/consultations/current-and-closed-consultations/hydrogen-blends-and-renewable-gases-procedures-review

# 6. Strong but agile governance

The energy transition is a complex coordination exercise on a national scale, affecting all parts of the supply chain. It requires collaboration between multiple stakeholders to deliver the transformation projects that Australia needs.

Electricity and gas markets are governed under a framework of legislation and regulations administered and enforced by regulatory bodies reporting ultimately to the Energy Ministers. These include the AER, AEMO, the AEMC and the ESB. Strong but agile governance underpins the achievement of our overarching objectives for the NEM.

While the scope and complexity of reforms are demanding, we are optimistic about progress.

The Strategic Energy Plan outlines two objectives:

- Do governance arrangements support the achievement of the national energy objectives?
- Are emerging issues addressed in a coordinated, timely and consultative manner?

We are particularly encouraged by the reinvigoration of the Energy Ministers' Meeting process. At this crucial juncture in the transition of our energy markets, it is vital that Ministers take an active role in overseeing and steering the overall policy framework. The multi-jurisdictional arrangements of the NEM and our gas market frameworks mean that regular discussions will be required, as is currently envisaged.

A positive indicator is the establishment of a new National Energy Transformation Partnership by Commonwealth, State and Territory Energy Ministers. The Partnership provides an umbrella framework to support the energy transformation and promote collaboration between jurisdictions. The ESB and other market bodies will support the Partnership as needed to develop the detail of its scope and work streams.

We are also encouraged that Energy Ministers have agreed to tackle head-on the nexus between energy and climate change policies. The agreement to include an emissions objective in the National Electricity Law (NEL), the National Gas Law (NGL) and the National Energy Retail Law (NERL) is a key enabler of this change. The Partnership will be Australia's first fully integrated national energy and emissions agreement.

The role of the ESB is to support Energy Ministers in their stewardship of our energy markets. The ESB has received revised terms of reference from Energy Ministers that ask us to provide advice for the purposes of:

- whole-of-system oversight for energy security and reliability of the national electricity market; and
- improving long-term planning
    - for the national electricity market;
    - in relation to investment in, and operation and use of, natural gas services.

The terms of reference also emphasise the importance of the ESB playing a coordinating role in ensuring collaboration between the individual market bodies as they carry out their own functions.

The ESB's current reform pathway and project plans respond to the Strategic Energy Plan which was adopted by Ministers in November 2019. It established a five-year vision for the future of the electricity and gas markets. Over the next year, Energy Senior Officials will seek direction from Energy Ministers about a potential refresh of the Strategic Energy Plan ahead of its expiration in November 2024. The ESB is expected to be involved in this process and will support the Energy Ministers in their long-term planning for the energy markets.

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