KPMG

ENERGY CONSUMERS AUSTRALIA

AUSTRALIA'S ENERGY TRANSITION

A snapshot of the changing policy landscape

Energy Consumers Australia & KPMG

September 2021

Foreword

Australia's Energy Transition is best achieved by a coordinated and cooperative approach to policy making that delivers a modern, flexible, resilient and affordable grid for all Australians.

The energy sector is on a journey of two transitions: to replace Australia's aging, fossil-fuelled infrastructure with a system that provides secure, reliable, clean energy, and to accommodate rooftop solar, household storage and smart appliances that reduce bills and overall system costs. Having the right policy settings in place will be crucial to managing these transitions in an affordable way for all households and small businesses, however they choose to engage in energy markets and irrespective of their means or ability to do so.

States currently face different challenges and pressures, and are developing bespoke policies to address them. Ultimately the same challenges will emerge in all states. Ideally these challenges will be addressed in a consistent, way recognising that much of Australia is connected via a single system. However, coordination will be difficult without a clear national policy and implementation plan, or a forum for sharing learnings between jurisdictions, including the experiences of Western Australia and the Northern Territory.

Before we can develop a clear national policy we need greater visibility and understanding of the suite of different policies and programs being implemented by state and federal governments and how they interact. That's what this report starts to do. It's easy to focus on the technical details of an individual policy. But with an interconnected market, where the policies implemented by one state government can have wider-reaching impacts, we need to understand the breadth of policies across all jurisdictions in order to understand the overall impacts on consumers' energy bills.

The report also highlights the huge amount of investment that is planned over the next decade in both transmission and generation. As an industry we need to make sure this investment minimises costs for consumers, and that any unnecessary or duplicative costs are avoided. This means recognising that generation and transmission can be substitutes, and that demand flexibility has a role to play. Leveraging consumer resources – with appropriate reward and social licence – will help reduce costs for everyone.

Retail energy prices have fallen recently and this was reflected in our most recent Energy Consumer Sentiment Survey, where value for money for electricity was rated the highest it's ever been. However we can't take our eye off the ball. Prices are still high, internationally and compared to the past, and with the pipeline of investment identified in this report there is a risk that prices will climb once again – this time off a higher base.

As the national voice for consumers, ECA's mandate is to navigate the national policy landscape, and it's a complex one. This report is intended to spark conversation across the industry on how best to coordinate Australia's energy transition to a modern, flexible and resilient grid that is affordable for all households and small businesses.

Lynne Gallagher
CEO, Energy Consumers Australia

While states are facing different challenges at the moment, the sector must remain focussed on delivering the needs of customers in an efficient and timely manner.

KPMG welcomes the opportunity to work with Energy Consumer Australia on preparing this summary of recent energy policy reforms.

It is a great initiative to bring together all the various policies by state, territory and federal governments under a common descriptive framework and hopefully it provides a useful resource to inform stakeholders and customers and improve engagement between parties.

The energy sector is undergoing a significant transformation. The energy policy landscape is also changing to enable the transformation with an increasing number of initiatives being driven at the jurisdictional level.

While a key driver of this change is decarbonisation targets being implemented by state governments, another driver is the increasing interactions and inter-dependencies between energy and other sectors of the economy. The emergence of zero emissions vehicles is integrating the transport and energy needs of the community, and the development of hydrogen will create inter-linkages between the electricity, gas and water sectors. The involvement of state governments is crucial to maximise the synergies between these sectors and to deliver an affordable, and inclusive energy sector.

The progress of change is extremely fast. 29% of Australian households currently have rooftop solar PV installed; by 2040 AEMO forecasts the total capacity of distributed energy resources to double or triple. Fundamentally, the sector must remain focused on delivering the needs of customers. The ability of consumers to help with this transformation through being rewarded for their demand flexibility will help to minimise any negative consequences. It will also facilitate greater trust and fairness in the sector. Demand flexibility is an important enabler in the transformation and it is timely to consider how policy can better facilitate participation by customers who have the opportunity and desire to manage their energy use and generation.

KPMG would like to thank Energy Consumers Australia for the opportunity to be involved in this important piece of analysis.

Eamonn Corrigan
Head of Utilities Policy & Regulation, KPMG

Introduction

CONTEXT

There are two, closely related, transitions underway in the energy system. As a nation we are moving from a carbon intensive system to a net zero one, but also from a system featuring a small number of distant generators to one in which the means of generating and storing electricity are shared by millions of Australians. In recent years, individual state and territory governments have increasingly implemented jurisdiction specific reforms and initiatives related to the energy sector.

The Australian Energy Market Agreement (AEMA) reflects a cooperative framework to deliver long-term collective benefits to outweigh any short-term pressures on parties to act unilaterally. States are however facing different customer and market issues thereby creating different pressures in relation to reliability, security and affordability. In addition, states have separate goals for decarbonisation.

The AEMA does not prevent parties from developing policies relating to environmental (including emissions reduction), energy efficiency (including demand management) and planning issues within their own jurisdictions. The above factors have led to a drive by state jurisdictions to introduce and rely on their own reforms in addition to the national framework, and in some cases diverging from the national agreement. This trend is likely to continue and will change the overall governance, market outcomes and risk allocation in the energy sector.

Purpose of the report

With respect to the changing policy environment, Energy Consumers Australia (ECA) has partnered with KPMG to better understand these recent jurisdictional interventions, the implications for customers and their relevance to the national arrangements.

The objective of this report is to present a common framework to describe the policies being discussed or implemented across all jurisdictions and the drivers for those policies.

A key theme within the transitioning energy system is the increasing role for consumers and the increasingly present opportunities for consumers to more actively impact their energy outcomes. Understanding the implications of policy activity taking place throughout this transition will be a key factor in enabling ECA and stakeholders to understand how jurisdictions are approaching key issues impacting the industry. The report serves to be a valuable knowledge sharing tool to inform ECA and a range of stakeholders on jurisdictional approaches to policy, and inform discussions between ECA, stakeholders and jurisdictional policy makers.

This report is an inaugural summary of the jurisdictional policies, and consumer and market outcomes. Going forward, this report may be updated from time to time with new jurisdictional initiatives and may serve as a tool to monitor the energy regulatory environment and consumer outcomes.

Structure of the report

The report is structured as follows:

- Introductory slides that outline our approach and the key messages delivered by this report.
- An outline of the national framework for energy policy making and how it relates to policy at the state jurisdictional level, including decarbonisation targets driving activity across Australia's states and territories.
- A snapshot of each jurisdiction that covers the challenges and trends emerging in the jurisdiction, a snapshot of key household and market outcomes, the policy outlook and some high-level insights from our analysis.
- An overview of a selection of emerging issues in the energy sector; including the role of gas as the energy transition progresses, the interaction of the energy sector with the wider economy, the impact of electric vehicles, and the impact of COVID-19.

Accompanying materials

KPMG and ECA have prepared a document of supporting materials that provides further detail beyond what is captured in this report, including:

- a description of all state, territory and Commonwealth jurisdictional energy policies considered in this report; and
- additional information for each state and territory jurisdiction, including a snapshot of household outcomes, the energy supply mix, and the supply-demand outlook (where sufficient information relating to reliability is publicly available).

Scope and timescale of this report

OVERVIEW

This report summarises a large number of jurisdictional energy policies – both electricity and gas – that have been, or are being, implemented by state and territory governments and the Commonwealth Government.

This report is not an exhaustive list of all policies introduced in all jurisdictions. Therefore, our approach in mapping the jurisdictional policies may not be a perfect indication of the policy direction of each jurisdictional government, but rather serves to provide an overall indication of the extent of current activity in energy policy by all governments.

Definition of 'policy' applied in this report

Policy is a term that has a broad definition and can be used to describe the actions of government in a broad range of forms. For the purposes of this report, policies captured relate to interventions by state and territory jurisdictional governments outside of the national framework, as well as a number of relevant interventions by the Commonwealth Government.

The focus of the report is on recent jurisdictional interventions that instigate change within the jurisdiction, or represent derogations from the national approach. Where a jurisdiction has an existing and ongoing position that derogates from the national framework in a certain area of the energy sector, this has not been captured as a policy, for example permanent derogations from the National Energy Customer Framework.

Certain aspects of jurisdictional government involvement in the energy sector have not been captured as policies in this report:

- The provision of government grants, some energy programs facilitated by governments and online resources made available to consumers have not been included in this report; although they represent important tools jurisdictional governments can use to drive investment and support consumers in their decisions.
- In some cases jurisdictional governments may be involved in supporting certain activities, but are not the key driver of the activity taking place, i.e. the private sector or Commonwealth Government are leading the activity, these scenarios may not necessarily be captured as an intervention by the state or territory jurisdictional government in this report.

Timescale of policies considered in this report

- The report aims to provide an up-to-date summary of recent policy activity; it captures 40 policies, of which 37 have been announced or introduced since January 2016, and 19 have been announced or introduced since January 2020.
- A small number of additional policies introduced prior to January 2016 have been captured, these policies all relate to jurisdictional energy efficiency schemes that have been operational for some time, but have been updated or extended in the last 2 years to include emerging technologies related to demand flexibility.

COVID-19

Jurisdictions have been very active in improving policies to protect customers from the impacts of the pandemic. While acknowledging this response, this report does not consider these initiatives in detail due to their temporary nature. An overview of the impact of COVID-19 on the energy sector, and jurisdictional policy responses is provided on page 38.

Our approach

Outline of our approach

The report provides a high-level scan of the current jurisdictional energy policy environment across Australia, covering both the electricity and gas sectors. For ease of comparison and understanding we have categorised the policies by three dimensions as explained below: a) the scope of intervention; b) the part of the supply chain where the policy is targeted (sector focus); and c) whether it relates to assets owned by customers (e.g. rooftop solar PV) or market owned assets. Where the scope of a given policy involves multiple objectives across different categories, or impacts multiple aspects of the supply chain, it may be mapped across multiple categories.

In categorising the policies, the report aims to present and describe the various jurisdictional policies under a common framework, maximising its value as a resource that allows users to access a summary of the policy environment in a given jurisdiction or a specific area of energy policy development. A detailed summary of each policy is provided in the supporting materials report.

The report intends to provide a broad coverage of the energy policy landscape, with a focus on recently introduced policies at the state level. The coverage of policies is not exhaustive, and is not a perfect reflection of the policy direction of a given jurisdiction. Information in the report is up-to-date as at July 2021, policies introduced thereafter are not captured in this report.

Sector focus

Each jurisdictional policy is categorised based on the segment of the energy supply chain it aims to target: wholesale, network or retail. Each policy is also categorised based on the sector of the energy market it aims to target: gas or electricity. In some cases, broader based policies may target multiple segments of the energy market or have an impact on the energy market as a whole across both gas and electricity.

Consumer-owned vs market-owned

Each jurisdictional policy has been categorised based on if it relates to consumer-owned or market-owned assets. This classification aims to provide an indication of whether a given policy has impact through the demand-side or supply-side of the market, whilst also acknowledging that in the transitioning energy market the distinction between demand-side and supply-side interventions is no longer clear cut, and a new language is needed to define this distinction.

Note that not all policies involve consumer-owned or market-owned assets, in which case the policy has not been classified under this category.

Scope of Intervention

Each jurisdictional policy is categorised based on the objective of the intervention. Three categories: learning, enabling and solving have been determined to reflect the stage of development a policy is at, and how directly the jurisdiction intervenes to achieve the targeted policy objectives, i.e. the level of control exercised by the jurisdiction.

Generally, ‘learning’ policies have a low impact on the national framework as they aim to improve the level of existing knowledge that may inform future developments, rather than have immediate impact on the market. ‘Solving’ policies, on the other hand, are significant large-scale interventions that alter investment or price signals under the national framework.

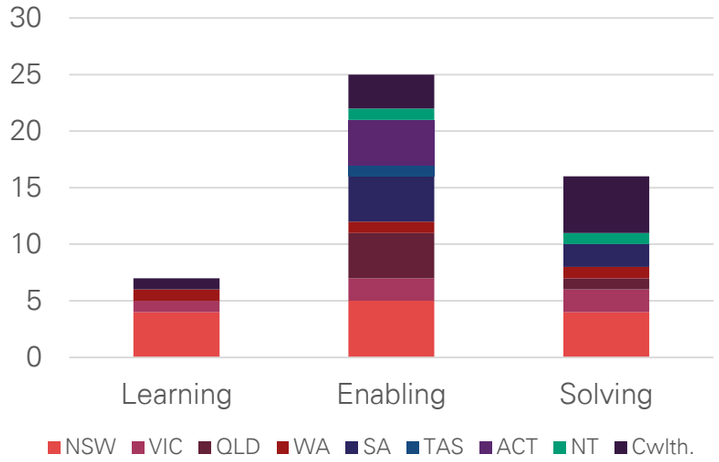
Learning	Enabling	Solving
Policies designed to improve the level of existing knowledge in a certain aspect of the energy sector and inform future reforms, e.g. trials.	Policies aiming to remove a barrier for the market to solve the issue.	Significant interventions with material market impacts to address a policy concern.

The nature of jurisdictional policy in Australia

We have grouped the jurisdictional policies according to their declared purposes. As Figure 1 below indicates*:

- Learning: 7 policies include objectives to improve the level of existing knowledge in a certain aspect of the energy sector and inform future reforms, e.g. trials. Among jurisdictions, New South Wales introduced the highest number of 'learning' policies.
- Enabling: 25 policies include objectives aimed at removing a barrier for the market to solve the identified issue. New South Wales introduced the highest number of 'enabling policies; and
- Solving: 16 policies are aimed at addressing a major policy concern. The Commonwealth and New South Wales have introduced the highest number of 'solving' policies.

FIGURE 1 – SCOPE OF INTERVENTION OF STATE AND COMMONWEALTH JURISDICTIONAL POLICIES



The majority of jurisdictional energy policies analysed focus on the electricity sector of the energy market. We identified 29 electricity policies, 3 gas policies and 8 policies that relate to both the electricity and gas sectors.

Figure 2 at right shows that the majority of jurisdictional policies focus on:

1. Market-owned assets related to networks and the wholesale market; and
2. Consumer-owned assets related to the retail sector.

- Policies impacting the broader network that involve market-owned assets are likely to unlock new renewable energy investments. There are risks associated with over-investment or developing networks too early or too late, with costs passed onto consumers. Policy design should be carefully considered to mitigate risks for consumers.
- Policies impacting the retail sector that involve consumer-owned assets are likely to give consumers more control over their energy use and potentially reduce their energy bills. These policies may also facilitate demand flexibility.
- The purpose of this mapping and categorising exercise is to provide a common framework to better consider the role of jurisdictional policy reforms in the sector. The aim is to improve stakeholders' awareness and understanding. We recognise that this framework may not be perfect and could simplify the nature of the policy changes.

FIGURE 2 – FOCUS AREAS OF STATE AND COMMONWEALTH JURISDICTIONAL POLICIES

	Ownership category of assets impacted by the policy		
Aspect of supply chain impacted by the policy	**Consumer-owned**	**Market-owned**	**N/A**
Wholesale	**0**	**18**	**1**
Network	**4**	**9**	**1**
Retail	**12**	**2**	**3**

*Note that where the scope of a policy's objectives covers multiple categories (e.g. learning and enabling) it may be presented above under both categories, meaning the number of policies presented in Figure 1 and Figure 2 do not align with the total number of policies considered in the report.
The NSW Electricity Infrastructure Roadmap has been categorised as three separate 'solving' interventions, related to different interventions introduced under the overall Electricity Infrastructure Roadmap as described on p. 15.

Key messages

Jurisdictional policies are becoming a permanent driver for consumer outcomes

- States are increasingly implementing their own approaches to the development of energy markets, moving away from the national framework.
- This report has identified 40 policies, of which 37 have been introduced in the last 5 years, including 23 announced within the last 2 years. These policies range greatly in purpose and scale – in terms of investment and number of consumers impacted.
- Jurisdictional involvement in energy policy making is likely to persist in the future. This will have an ongoing and permanent impact on consumer outcomes and the role of the national markets and market governance arrangements.

Consumers should be placed at the front of policy-making

- The energy market is here to serve customers. Jurisdictions, when developing policies, can seek to fully take account of customer views, behaviours and preferences.
- This is best achieved by starting with understanding and evaluating customers' needs and preferences when developing the policy initiative. This should be the first step.
- Traditional approaches to engage with stakeholders and consumers during policy development could be reviewed and improved. More collaborative processes for consumers to influence and inform the fundamental policy objectives could be valuable.

All consumers must be included in the energy transition

- As the energy transition progresses, vulnerability is expanding beyond only low-income households.
- Any customer who will face barriers to participating in and benefiting from the market (e.g. renters, apartment occupiers), or who may find it difficult to be informed in a market with increasingly technical opportunities for consumers (e.g. those from culturally and linguistically diverse backgrounds, older customers) must be considered in policy making.
- Increasingly, jurisdictions are starting to recognise the changing nature of the challenges faced by consumers in their policy design. This is a positive first step in developing a market that serves all consumers.

Technology 'enabling' policies are a key positive development in recent policy making

- For many years, technology neutrality was one of the key principles of energy policy making. However, due to the energy transition and growth of consumer-owned assets this concept may no longer be effective at delivering the optimal outcome for the market.
- States are actively looking to better support emerging technologies that are aligned with decarbonisation targets and facilitate the role of consumers in a two-sided market. This is contributing to divergences from national frameworks, including how energy sector infrastructure is valued and approved.

Flexibility in the demand of customers should be given due consideration in policy making

- Consumers have access to new technologies that may facilitate better outcomes in the reliability of their energy supply and in their energy bills, and support the network through the energy transition.
- Failure to unlock, or underestimation of the potential of demand flexibility could lead to overinvestment in network and generation assets, passing additional costs onto consumers.
- Moving forward, jurisdictional policies could further consider how markets can be designed to enable and support consumers in actively participating in the market, through being flexible in their demand for energy.

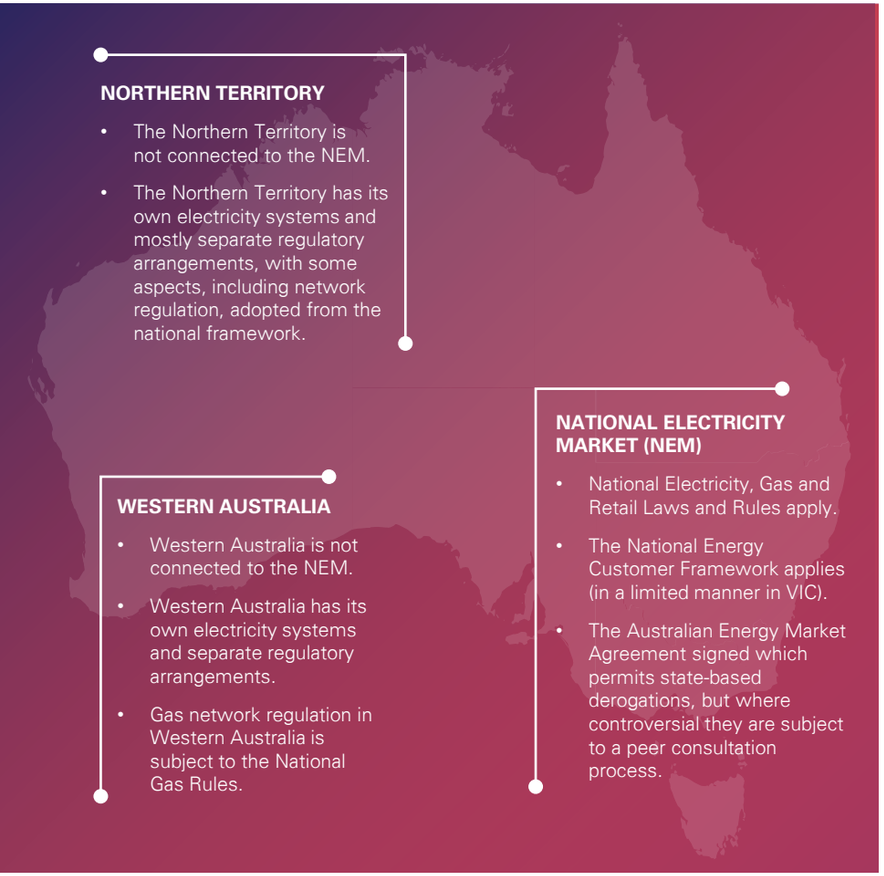
What does the current and emerging policy landscape mean for consumers?

- A common issue with all policy reforms is understanding the timing and distribution of both costs and benefits. Who pays and who benefits may not necessarily be the same.
- While costs are often known and up-front, it is more difficult to evaluate benefits – both from a timing and allocation perspective.
- Ensuring affordability of energy bills for all consumers remains the key for customers into the future. Consumers being adversely affected or left behind in the transition to a decentralised energy system needs to be carefully considered and managed especially if customers pay more than they benefit from the policy change.

Contents

THE JURISDICTIONAL ENERGY POLICY LANDSCAPE

Overview of the national framework and recent energy policy developments



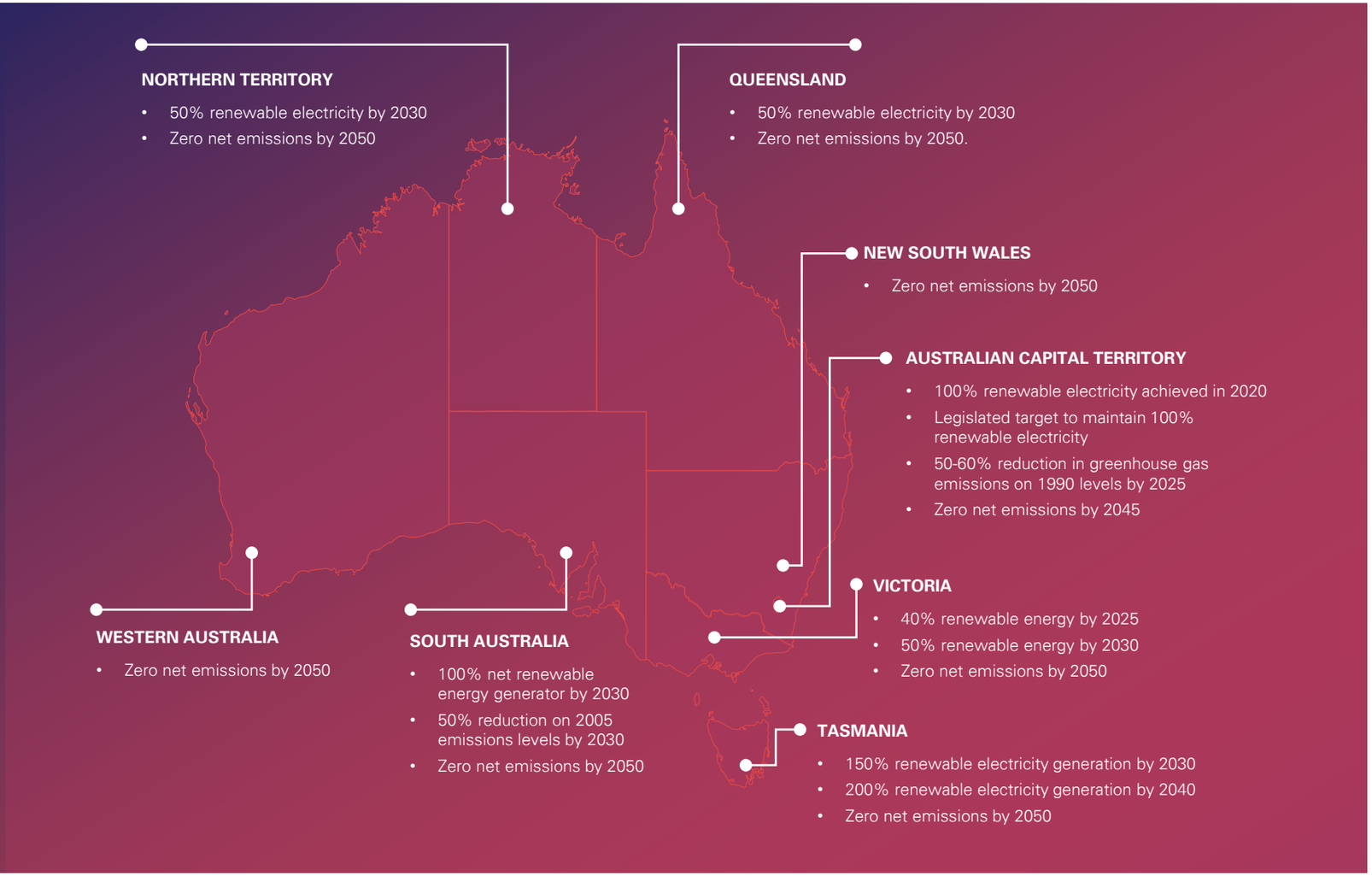
The Australian Energy Market Agreement

- Constitutionally, energy policy in Australia is a matter for state governments. The Commonwealth has primary responsibility for emissions reduction policy with a co-ordinating role for energy policy.
- The development of the NEM over the past two decades has been achieved through the Council of Australian Governments (COAG). On 29 May 2020, the Prime Minister announced the establishment of the National Federation Reform Council and the disbanding of the COAG.
- In a federal system, different levels of government have different priorities and pressures. The Australian Energy Market Agreement (AEMA) reflects a cooperative framework to deliver long-term collective benefits to outweigh any short-term pressures. Under the AEMA, governments agreed not to take any action "that would limit, vary or alter the effect, scope or operation of the Australian Energy Market Legislation without the agreement" of the Council.
- The AEMA explicitly recognises that it does not prevent parties from developing policies relating to environmental (including emissions reduction), energy efficiency (including demand management) and planning issues within their own jurisdictions.
- While state-based derogations from the national framework are permitted, where controversial, they are subject to a peer consultation process to ensure they do not have spill over effects and do not in any other way undermine the fundamentals of the NEM.

Relationship between jurisdictional policies and the national framework

- The report covers 40 jurisdictional energy policies most of which operate separately from the national framework. A number of the policies identified will alter the application of the national framework and could change investment signals and outcomes for customers significantly. How such policies co-exist with and complement the national framework is an important consideration.
- Decarbonisation targets and views on how to achieve those targets, consideration of local customer issues, and ensuring secure and reliable supply has required jurisdictions to be more involved and implement policies to best reflect state based issues.
- Further there is increasing convergence between different sectors of the economy – transport, water, housing, electricity and gas. This is driven by new technologies and also the pathway to a more sustainable future. For example, hydrogen has the potential to materially transform all of these sectors. Jurisdictional governments therefore have to be more involved to manage this sector convergence effectively.

Jurisdictional decarbonisation targets



Jurisdictional decarbonisation targets

Jurisdictions have introduced state targets and many jurisdictional policies are aimed at facilitating the achievement of these targets. Many of these targets seek to go further than the national target to reduce emissions by 26 to 28 per cent on 2005 levels by 2030.

These targets are a key driver for the increased activity by state governments in energy policy. This page provides an overview of existing state and territory decarbonisation policies.

Federal government decarbonisation policies and targets

Large-scale Renewable Energy Target

The Large-scale Renewable Energy Target (LRET) incentivises investment in large-scale renewable energy power stations by legislating demand for large-scale generation certificates.

The Clean Energy Regulator announced in September 2019 that sufficient projects had been approved to meet the LRET's 2020 target of 33,000 GWh of additional renewable energy. The annual target will remain at 33,000 GWh until the scheme ends in 2030.

Small-scale Renewable Energy Target

The Small-scale Renewable Energy Scheme (SRES) incentivises households, businesses and the community to install small-scale systems by legislating demand for small-scale technology certificates.

The SRES is scheduled to run until 2030, with the subsidies available under the program scaling down each year until 2030.

Australia's obligations under the Paris Agreement

Australia remains party to the Paris Agreement.

Australia's Nationally Determined Contribution under the Paris Agreement is to reduce greenhouse gas emissions by 26–28% on 2005 levels by 2030, this goal was first communicated in 2015, and Australia recommitted to this goal in 2020.

Jurisdictional energy policies considered in this report

Learning

Policies designed to improve the level of existing knowledge in a certain aspect of the energy sector and inform future reforms, e.g. trials

New South Wales
- Net Zero Industry and Innovation Program
- Solar for Low Income Households

Victoria
- Neighbourhood Battery Initiative

Note that a number of the 'enabling' policies also have learning objectives they achieve by removing barriers to facilitate the uptake of emerging technologies and progress innovative models.

Similarly, jurisdictions also use a number of other tools, such as grant funding, to support learning activity, however these activities have not been captured as policies in this report.

Enabling

Policies aiming to remove a barrier for the market to solve the issue.

New South Wales
- Energy Savings Scheme
- Regional Community Energy
- Empowering Homes Solar Battery Loan Offer
- Peak Demand Reduction Scheme

Victoria
- Solar Homes Program
- Victorian Energy Upgrades Program

Queensland
- Solar 150
- Renewables 400
- CleanCo
- Wandoan South Battery Energy Storage System

Western Australia
- DER Roadmap

South Australia
- Grid-Scale Storage Fund
- Home Battery Scheme
- Retailer Energy Productivity Scheme

Tasmania
- Renewable Energy Action Plan
- Australian Capital Territory
- Gas Phase-out
- Community Solar
- Next Generation Energy Storage Program
- Energy Efficiency Improvement Scheme

Northern Territory
- Home and Business Battery Scheme

Commonwealth
- National Gas Reservation Scheme
- Underwriting New Generation Investments Program
- Technology Investment Roadmap
- Australian Gas Security Mechanism

Solving

Significant interventions with material market impacts to address a policy concern.

New South Wales
- Energy Infrastructure Roadmap
- Emerging Energy Program

Victoria
- Victorian Default Offer
- Renewable Energy Zones Development Plan

Queensland
- Renewable Energy and Hydrogen Jobs Fund

Western Australia
- Whole of System Plan

South Australia
- Energy and Emissions Reduction Agreement
- Smarter Homes

Northern Territory
- Electricity Market Priority Reform Program

Commonwealth
- 'Big Stick' Legislation
- Snowy 2.0
- Default Market Offer
- Hunter Power Project (Kurri Kurri Power Station)

JURISDICTIONAL SNAPSHOTS

Framework for providing a jurisdictional snapshot

For each jurisdiction, we have provided a one-page snapshot of the energy landscape within the jurisdiction. The four key components of the jurisdictional snapshot are: a summary of challenges and trends, a selection of key metrics, a map of the policy environment, and some high-level key insights relating to the current and future position of the energy sector.

Our selection of key metrics

For each state we have included some key statistics that help to provide an indication of how consumers are progressing within the energy transition in each state and territory. These metrics relate to how well progressed each jurisdiction is regarding consumer-owned energy resources, including uptake of rooftop solar PV and batteries.

Furthermore, we have included measures of customers at risk of being left behind in the transition, including renters and customers experiencing hardship. Note that this does not represent a complete picture of customers who may face barriers to investing in DER, or of all customers who currently face payment difficulties or who may face payment difficulties in the future.

We have also included a measure of the proportion of total generation capacity that is renewable, indicating the progression of each jurisdiction in the transition towards renewable energy and decarbonisation targets.

Note that this measure relates to nameplate generation capacity, and is indicative only, given the challenge in accurately representing the differing capacity factors of variable renewable energy such as wind or solar and thermal generation such as coal or gas fired generation.

Our framework for mapping jurisdictional policies

For each jurisdiction, the policies covered in this report have been categorised and visually represented using the framework below. Energy policies vary greatly in terms of their objectives and the mechanisms by which they seek to achieve them, therefore it is difficult to compare and contrast policies on a consistent basis. Our approach seeks to categorise policies under a common framework, recognising that although all policies ultimately aim to deliver improved outcomes for consumers, they each use a different means to achieve this and will have a different impact on the sector. This framework provides a high-level snapshot of the policy environment in each jurisdiction, and is complemented by detailed summaries of each policy provided in the supporting materials document.

Visual representation of the policy environment

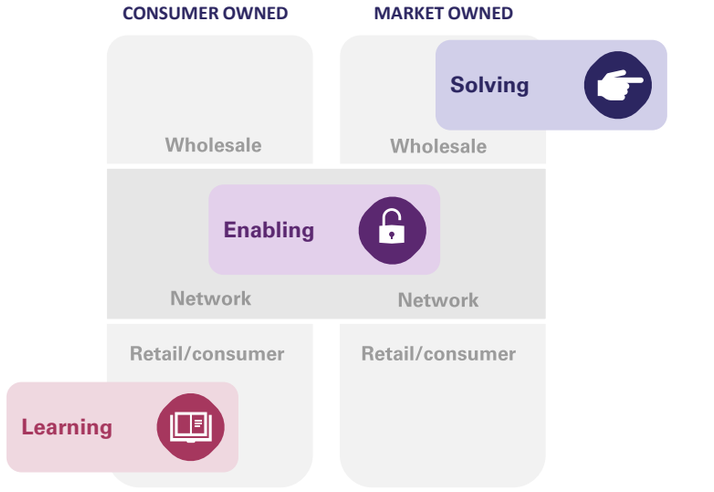
The placement and colour of each policy on the map to the right seeks to provide an accessible visual representation that communicates three key aspects of each policy:

- Whether it relates to consumer or market owned assets;
- The segment of the energy supply chain it impacts (retail, network or wholesale); and
- The scope of its objectives (learning, enabling or solving).

The value of the ‘learning-enabling-solving’ framework

By categorising each policy as being learning, enabling or solving focused in its objectives, we have sought to provide a common framework under which to describe policies.

All policies have a similar broad objective to deliver improved outcomes for consumers, but often vary greatly in their specific objectives and the mechanisms implemented to achieve them. The learning-enabling-solving framework provides a tool to categorise the scope of each policy’s objectives and highlight the differing ways in which jurisdictional governments seek to improve energy market outcomes, as well as providing useful information regarding the nature of each policy.



New South Wales

KEY INSIGHTS

Although a reliability gap has been declared, sufficient projects may already be underway to address the gap

AEMO has declared a reliability gap of 154 MW for NSW in 2024. However, AEMO's modelling to forecast this reliability gap did not consider the impact of the Emerging Energy Program. This program supports 5 capital projects with a combined capacity of 220 MW, addressing the forecast shortfall.

Balancing the risks to customers from infrastructure changes

To reduce the risk of price rises or service outages, additional generation and transmission projects are underway. It will be important that new capacity and REZ infrastructure are built at the lowest cost so the benefits of downward wholesale price pressure are retained, and the risk of passing on the costs of capacity procured at too high cost to consumers is minimised.

KEY STATISTICS

25%
Households that have solar PV installed

6,804
Number of households with battery storage installed

45%
Total nameplate generation capacity that is renewable (incl. rooftop solar PV)

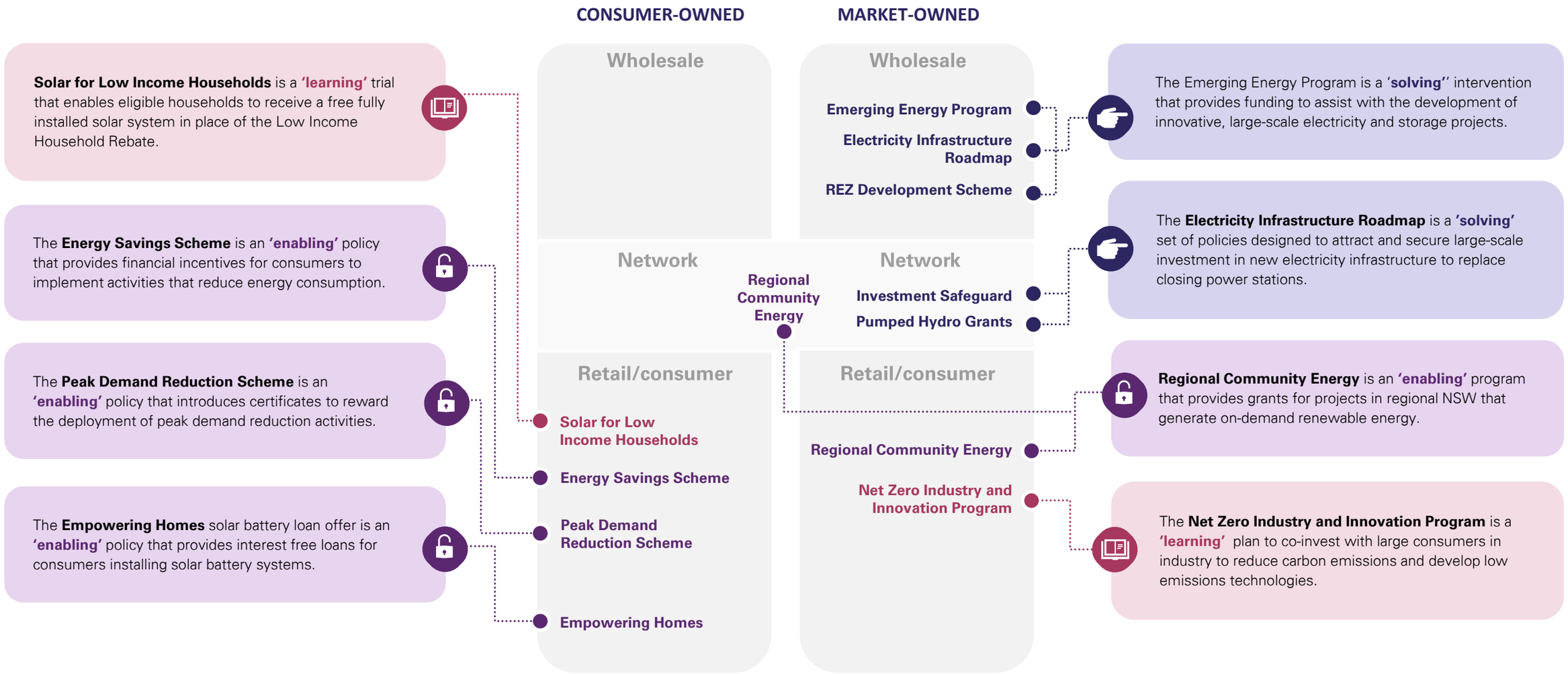
34%
Households renting in 2017/18

1%
Electricity customers on a hardship program

CHALLENGES AND TRENDS FACING NSW

- Four power stations in NSW currently provide approximately 75% of the state's electricity. However, they are scheduled to retire within the next 15 years.
- NEM price signals and economic regulation of transmission alone may not be enough to ensure sufficient and timely deployment of private capital. Power stations could therefore reach the end of their operating life without timely replacement.
- Consumers carry the risk that generation closures result in high prices or unexpected service outages.
- NSW is a net importer of electricity. If national reforms currently underway are insufficient in addressing the generation shortfall, commissioning timely new generation will be challenging given long lead times on capital intensive projects. This may leave NSW more dependent on importing electricity from other states.
- On the other hand, over-investment in generation and networks to address the shortfall creates the risk of high costs being passed on to consumers.

New South Wales



Victoria

KEY INSIGHTS

Large-scale generation by market-owned assets

AEMO forecasts the Interim Reliability Measure to be breached in 2028-29 and 2029-30. Commissioning new large-scale generation is currently a key focus, primarily through the REZ Development Plan. Additionally, the impact of the Yallourn Power Station in removing dispatchable generation needs to be closely monitored.

Small-scale generation by consumer-owned assets

Significant rooftop PV uptake will further reduce minimum demands which are projected to become negative by 2028-29. Facilitating demand flexibility and access to storage, such as through the Energy Upgrades Program and the Neighbourhood Battery Initiative will seek to address these challenges.

KEY STATISTICS

21.1%
Households that have solar PV installed

3,347
Number of households with battery storage installed

56%
Total nameplate generation capacity that is renewable (incl. rooftop solar PV)

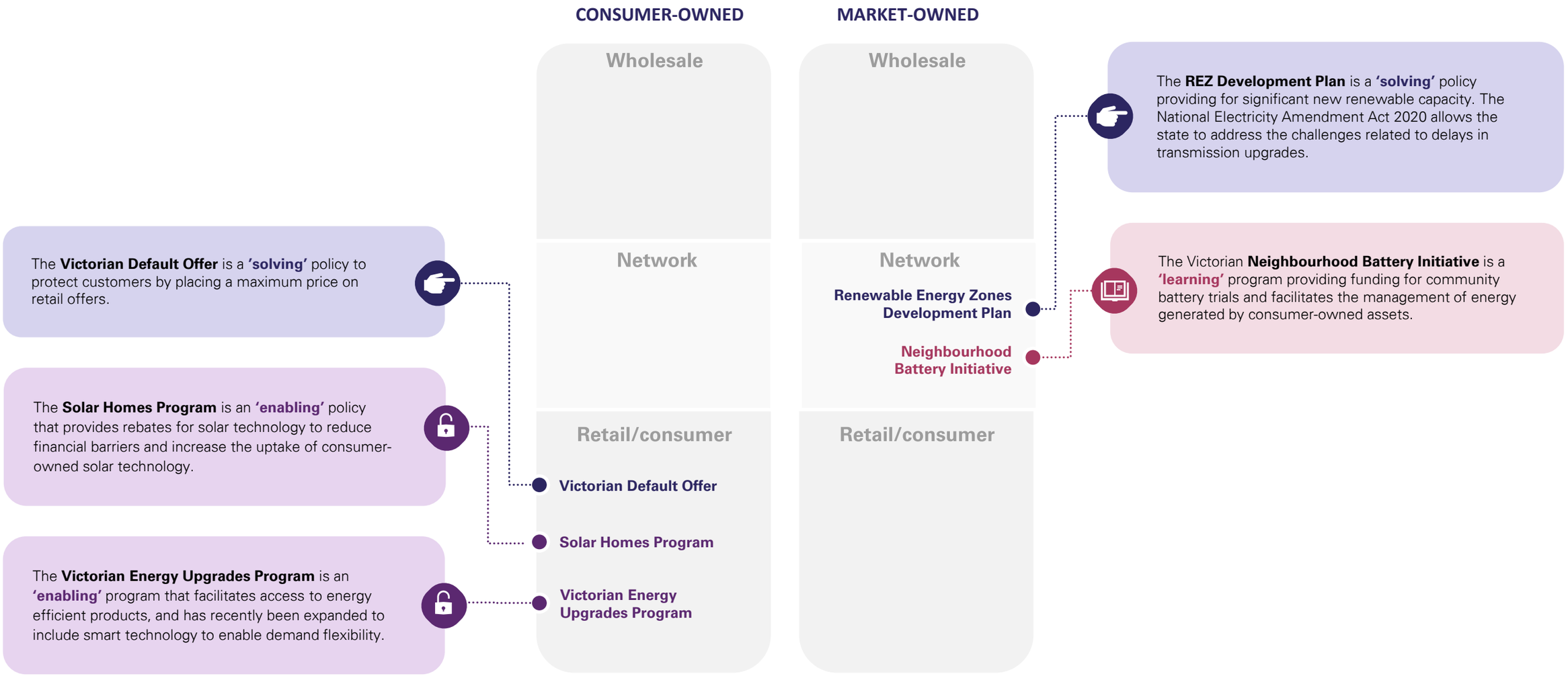
29%
Households renting in 2017/18

2.43%
Electricity customers on a hardship program

CHALLENGES AND TRENDS FACING NSW

- 4,820 MW of coal-fired generation will retire within the next 30 years. The 1,480 MW Yallourn Power Station currently generates approximately 22% of Victoria's electricity. Its closure in 2028, four years earlier than initially scheduled, will have a significant impact on Victoria's supply mix.
- Wind and solar projects have faced significant delays to their commissioning due to network and system security issues.
- Smart meters are now in place in all homes, installed as part of the Advanced Metering Infrastructure rollout between 2009 – 2015.
- Victoria is highly dependent on gas, Victoria represents 65% of Australia's total residential gas consumption.
- Victoria has never adopted the National Energy Retail Rules. Although, the Victorian retail regime mirrors the national framework in most areas, it diverges in some areas from the national approach e.g. in relation to consumers experiencing hardship or payment difficulties.
- Victoria is a net exporter of energy, having exported more energy than imported in 10 of the past 17 quarters.

Victoria



Queensland

KEY INSIGHTS

Significant system level change will be the key focus of Queensland's energy transition

- There are currently 44 large-scale renewable energy projects underway in Queensland (operating, under construction or financially committed). Large-scale solar technology will make up the majority of new additions to Queensland's generation capacity.
- The closure of the Callide B coal-fired generator will be the largest single change to Queensland's generation mix in the next 10 years, removing 700 MW of capacity from Queensland's energy supply and increasing the reliance on intermittent renewables.
- Transmission upgrades such as the Queensland-NSW Interconnector upgrade are important in facilitating the entry of renewable generation capacity.

KEY STATISTICS

39.6%
Households that have solar PV installed

7,736
Number of households with battery storage installed

39%
Total nameplate generation capacity that is renewable (incl. rooftop solar PV)

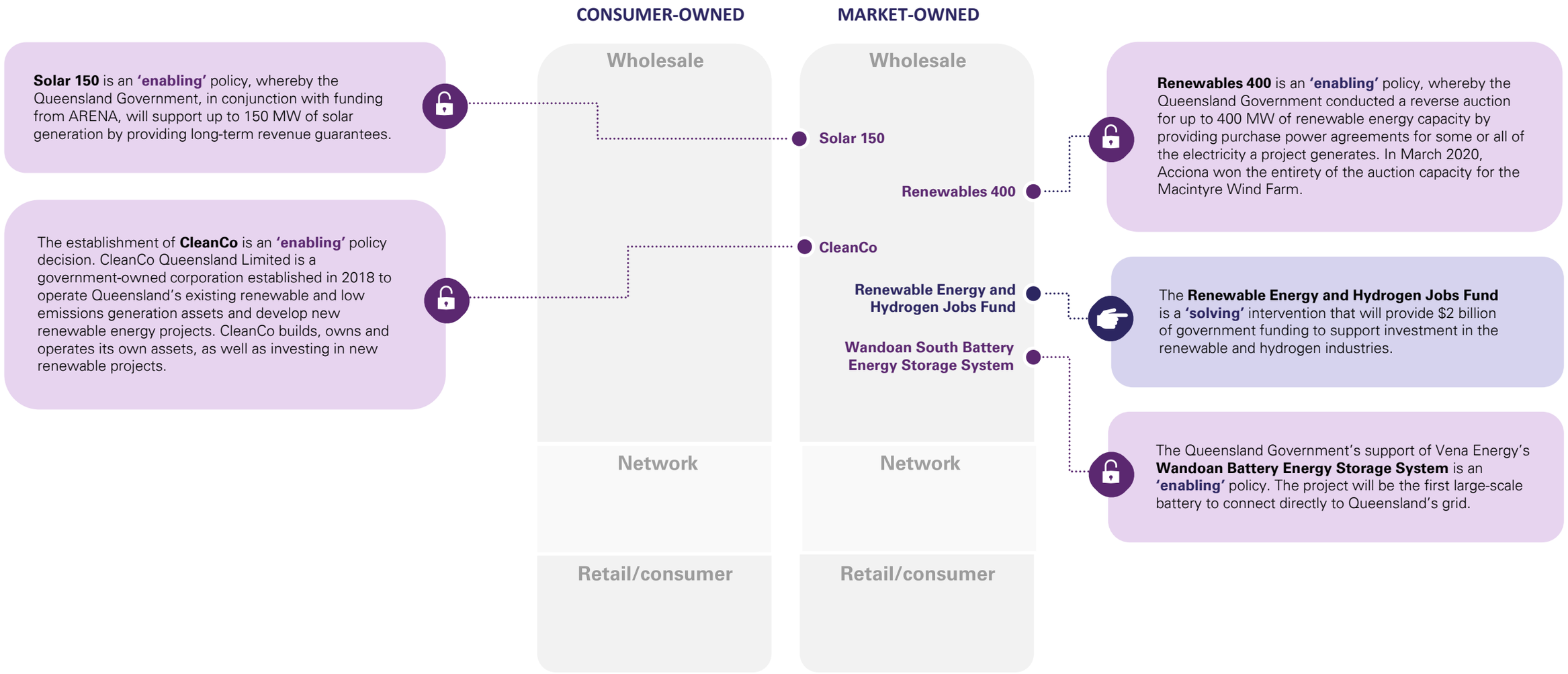
36%
Households renting in 2017/18

0.9%
Electricity customers on a hardship program

CHALLENGES AND TRENDS FACING NSW

- Queensland will be increasingly reliant on solar in the future. Serving a large portion of consumer demand with intermittent renewables may present challenges of falling levels of minimum demand during the day, and serving evening peak demand when the sun is not shining.
- The majority of generation capacity is owned or controlled by the state government. Following historically high price levels in the state, in 2017 the Queensland Government directed generation business, Stanwell, to put downward pressure on wholesale prices. Queensland has since delivered low prices in wholesale and retail markets.
- Queensland is a net exporter of energy, having exported more energy than imported in all 17 of the past 17 quarters.
- Queensland has the third largest state population, but generated the most energy in 2020. With a large surplus of generation capacity, upgrades to transmission infrastructure and energy storage will be key to facilitating the storage and export of excess generation.

Queensland



Western Australia

KEY INSIGHTS

Maximising value of DER key for market transition

The Project Symphony orchestration project (as part of the DER Roadmap) will develop and test the core elements required to optimally integrate DER into technical systems, energy markets and with consumers. This could provide the platform for capturing and utilising the full value of DER in delivering affordability and reliability.

Managing demand and system security throughout the transition to renewables and DER

Minimum demand is falling in WA, forecast to fall below the system security threshold as early as 2023-23. As identified in the DER Roadmap, a key focus for WA is to manage the impact of continued uptake of consumer-owned solar PV, such that peakier household demand does not threaten reliability.

KEY STATISTICS

33.4%
Households that have solar PV installed

2,171
Number of households with battery storage installed

34%
Total nameplate generation capacity that is renewable (incl. rooftop solar PV)

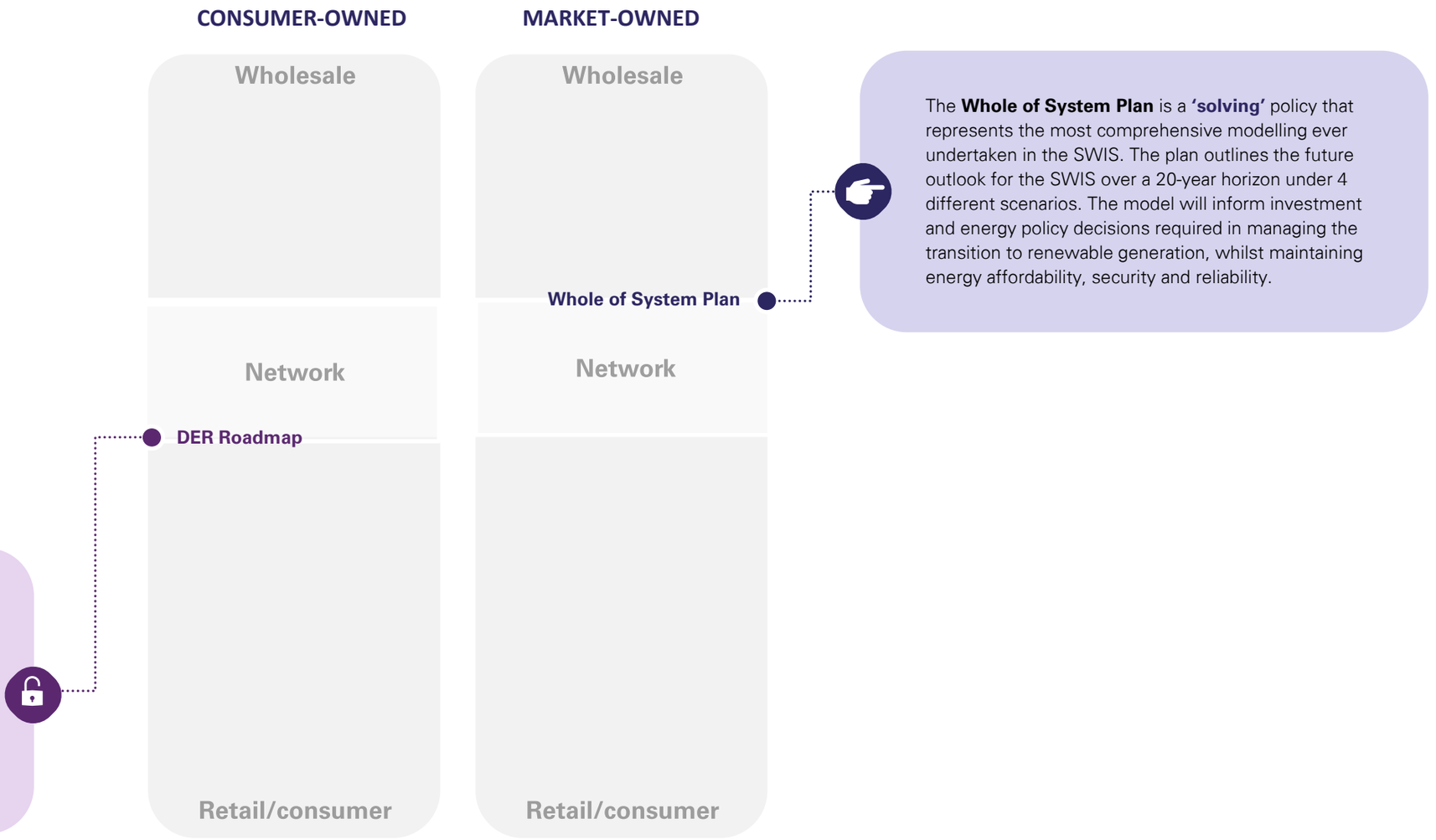
28%
Households renting in 2017/18

2.9%
Electricity customers on a hardship program

CHALLENGES AND TRENDS FACING NSW

- The Wholesale Electricity Market (WEM) and South West Interconnected System (SWIS) operate separately from the NEM, as such WA's energy system is isolated with a limited ability to import energy from other states, and is reliant on supply from generators within WA only.
- WA does not have a legislated renewable energy target, both coal and gas fired generation are likely to continue to play a role in the generation mix in the next decade and beyond. DER and hydrogen are both likely to play a role in decarbonising WA's energy system.
- WA's energy system is highly geographically distributed, with long transmission lines that are more susceptible to reliability challenges. Stand-alone power systems are one solution being investigated and trialed in WA.
- WA is also pursuing trials of alternative and emerging technologies such as microgrids and virtual power plants (VPPs).
- Orchestrating the integration of DER technology has been identified by the WA Government as a key challenge and priority.

Western Australia



The **Whole of System Plan** is a **'solving'** policy that represents the most comprehensive modelling ever undertaken in the SWIS. The plan outlines the future outlook for the SWIS over a 20-year horizon under 4 different scenarios. The model will inform investment and energy policy decisions required in managing the transition to renewable generation, whilst maintaining energy affordability, security and reliability.

The **DER Roadmap** is an **'enabling'** policy that will guide changes to policies, regulations, technical requirements and customer protections between 2020 and 2025 to support the integration of DER into the power system. Actions under the Roadmap relate to four aspects of the DER transition: technology integration, tariffs and investment signals, DER participation, and customer protection and engagement.

South Australia

KEY INSIGHTS

Progress of South Australia in transitioning to renewables

South Australia now has a significant stock of renewable generating assets, both consumer-owned and market-owned. The emerging direction for South Australia is to pursue identified growth technologies that provide storage or flexibility, such as hydrogen, electric vehicles, and virtual power plants (VPPs).

The interim challenge for South Australia

Until the technologies noted to the left are commercially viable and have sufficiently penetrated and integrated into the energy system, South Australia faces a significant challenge of managing minimum demand and maintaining system security as generation becomes increasingly distributed and daily load curves become peakier.

KEY STATISTICS

38.5%
Households that have solar PV installed

11,102
Number of households with battery storage installed

58%
Total nameplate generation capacity that is renewable (incl. rooftop solar PV)

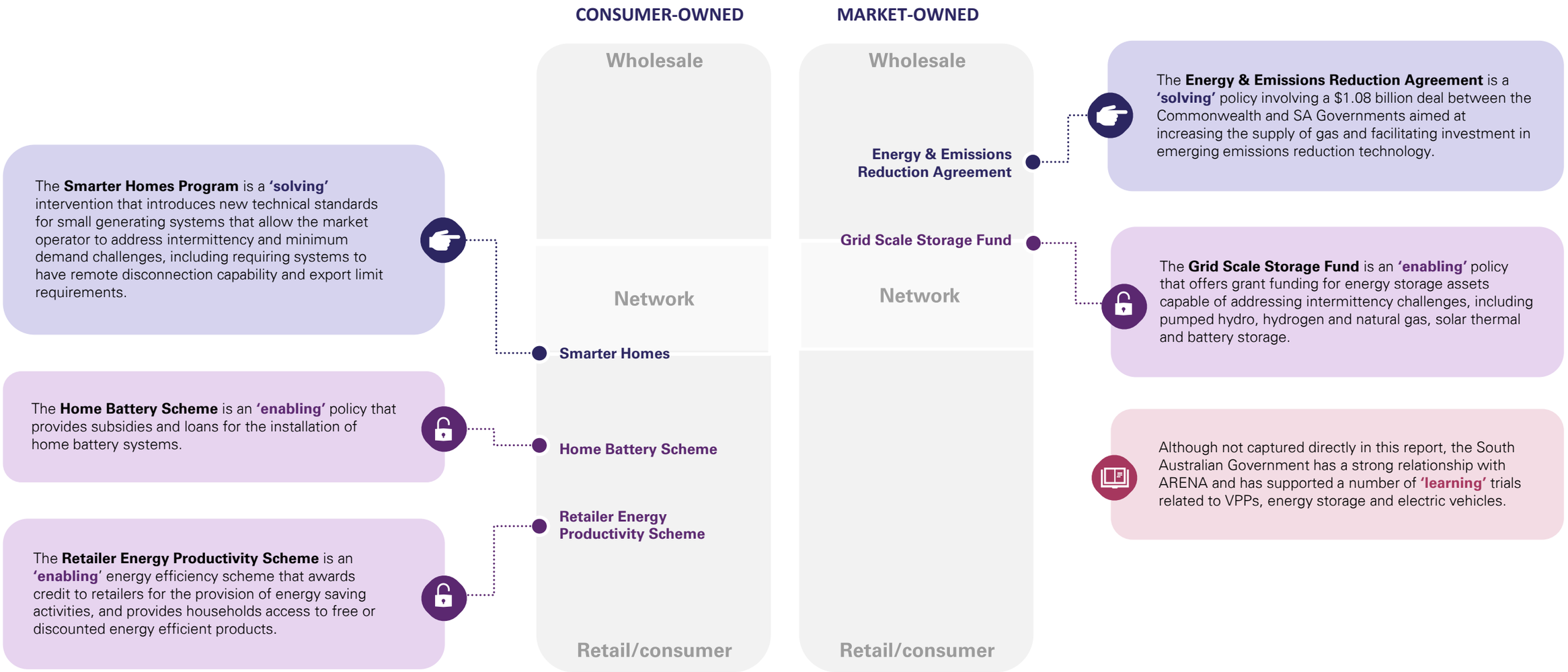
30%
Households renting in 2017/18

1.9%
Electricity customers on a hardship program

CHALLENGES AND TRENDS FACING NSW

- Low system strength has emerged as an issue in South Australia as the generation mix in that region shifts from one dominated by synchronous generators to one with a growing asynchronous renewable generation.
- In March 2021, 67 MW of solar PV was curtailed due to forecast demand falling below the secure demand threshold.
- Between 2016 and 2019 South Australia had the highest wholesale prices in the NEM, and continues to experience high retail prices. Key drivers of this are reliance on expensive gas generation, peaky demand and limited interconnection with other regions.
- The Project EnergyConnect interconnector between SA and NSW to be completed in 2024-25 is expected to provide a substantial reliability improvement and deliver a saving of $100 per annum to customers in South Australia.
- South Australia is a net exporter of energy, having exported more energy than imported in 10 of the past 17 quarters.

South Australia



Tasmania

KEY INSIGHTS

Tasmania's energy landscape takes on different characteristics than the challenges present in other states

With a much smaller population and significant generation capacity relative to demand, Tasmania is not facing the same pressures related to meeting peak demand. Furthermore, with limited large-scale and rooftop solar PV capacity, reliability challenges associated with decreasing minimum demands are not emerging in Tasmania.

The pursuit of Tasmania's Renewable Energy Target (TRET) will require significant system level changes

AEMO's 2020 ISP indicates that just under 1.4 GW of new large-scale VRE will be required to meet the TRET by 2040. Furthermore, transmission and storage infrastructure, such as Marinus Link and the Battery of the Nation, will be important to enable significant excess generation to be effectively exported to the mainland NEM.

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KEY STATISTICS

16.3%
Households that have solar PV installed

695
Number of households with battery storage installed

89%
Total nameplate generation capacity that is renewable (incl. rooftop solar PV)

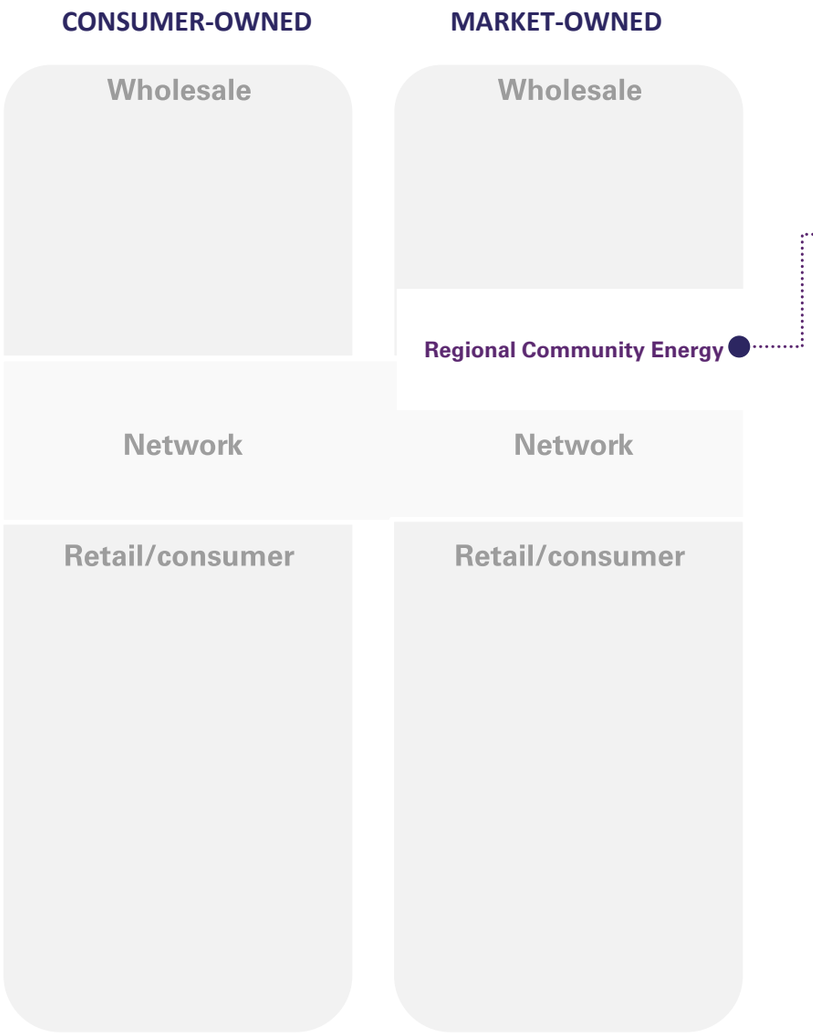
26%
Households renting in 2017/18

2.1%
Electricity customers on a hardship program

CHALLENGES AND TRENDS FACING NSW

- Hydro power generation supplies approximately 80% of the state's power. Tasmania's energy generation is weather dependent, in extended periods of low rainfall, Tasmania can become reliant on imported electricity and thermal generation from the Tamar Valley Power Station.
- Tasmania has imported more energy than exported in 10 of the past 17 quarters, although Tasmania's net exports balance fluctuates significantly.
- Tasmania is expected to become a net exporter following the implementation of the Battery of the Nation. It is important that costs to consumers are managed as Tasmania pursues this goal.
- Tasmania has a strong natural advantage in wind and water resources, but less application for solar PV. This is reflected in the current mix of generation stock.
- A lack of retail competition and a high level of residential energy use means Tasmanian consumers face the highest energy bills in Australia. Furthermore, the regulated retailer will need to innovate to engage consumers to implement demand flexibility measures.

Tasmania



The **Tasmanian Renewable Energy Action Plan** is an **'enabling'** policy that sets out the Tasmanian Government's strategic vision for the future of renewable energy, including the setting of targets and actions over a 20 year period.

Marinus Link is a proposed 1,500 megawatt capacity interconnector to further link Tasmania and Victoria as part of Australia's future electricity grid. The project is seeking to provide access to Tasmania's cost-competitive renewable energy and storage resources.

Tasmania's policy making focus is strongly attached to the achievement of their renewable energy target of 200% by 2040, namely via building on their existing significant renewable energy generation capacity through supporting large-scale renewable energy assets, and transmission connections to the mainland NEM to facilitate the export of excess generation.

Australian Capital Territory

KEY INSIGHTS

The ACT as an innovation leader

With a small population, the impact that energy policy in the ACT can have on national outcomes is somewhat limited. However, the ACT plays an important 'learning' role, both through consumer uptake of emerging technologies, and through formal trial programs. The ACT Government has identified strengthening their brand as a destination for clean energy research and innovation as a key focus.

The ACT's interaction with the NEM

Only a small portion of ACT residents' energy consumption is generated within the state, relying on imports from other states. To achieve its renewable energy target, the ACT invests in renewable energy sources in other states to feed renewable energy into the grid, equivalent to the shortfall of non-renewable energy that Canberrans consume via imports from generators in other states.

KEY STATISTICS

23%
Households that have solar PV installed

1,403
Number of households with battery storage installed

100%
Total nameplate generation capacity that is renewable (incl. rooftop solar PV)

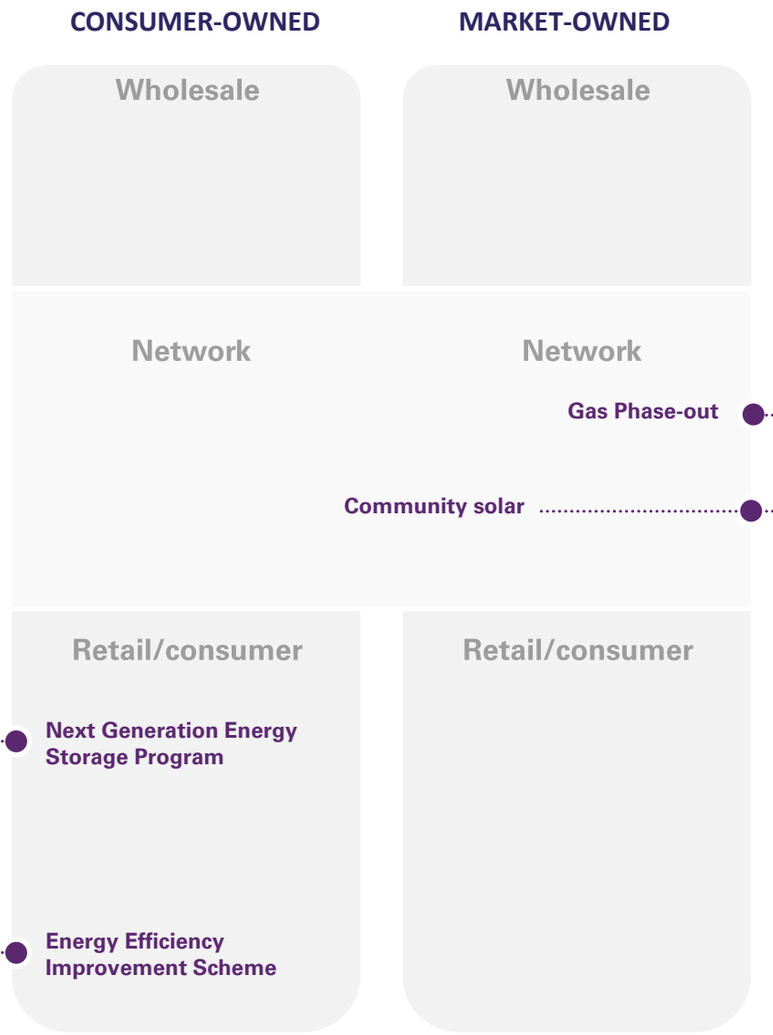
34%
Households renting in 2017/18

0.7%
Electricity customers on a hardship program

CHALLENGES AND TRENDS FACING ACT

- The ACT is a leading jurisdiction in the transition to renewable energy, having achieved a renewable energy target of 100% in 2020.
- The ACT only generates approximately 5% of the energy its residents consume, therefore the ACT will be subject to some of the challenges associated with retirement of thermal generators in other NEM states, particularly NSW.
- Based on AEMC analysis (2020 Residential Electricity Price Trends Report), the highest environmental costs in consumer bills are in the ACT – around 10% of the bill. This is primarily driven by the costs associated with feed-in tariff schemes.
- Natural gas is a significant energy resource in the ACT, and is one of the largest contributors to emissions. The ACT Government has identified the need to phase out natural gas, as well as effectively manage the cost implications for consumers and the network challenges of additional electricity demand associated with this transition.

Australian Capital Territory



The **Next Generation Energy Storage Program** is an **'enabling'** program that provides rebates on battery installations on residential and business premises. The program is targeted at reducing the upfront costs associated with battery storage technology, to encourage uptake

The **Energy Efficiency Improvement Scheme** is an **'enabling'** energy efficiency scheme that places a requirement on retailers to either deliver energy savings initiatives to customers, or pay a contribution towards energy saving activities.

The **Gas Phase-out** is an **'enabling'** policy that removes the mandatory requirement for gas connections to new developments, allowing new suburbs to be all-electric with zero emissions..

Community Solar is an **'enabling'** program run by SolarShare that allows ACT residents to invest in the Majura Valley Community Solar Farm. The ACT Government has committed to a feed-in tariff of 19.5c/kWh to support the project and provide certainty to its community investors.

Northern Territory

KEY INSIGHTS

Visibility and role of rooftop solar PV

In aggregate, rooftop solar PV is already the largest generator in the Darwin Katherine Interconnected System, however System Control has very limited visibility of this generation unit. 183 MW of gas-fired generation is scheduled to be decommissioned from 2026-28, hence rooftop PV will play an increasing role in the supply mix, and integrating consumer-owned units will be important to facilitate this.

Redesign of the Northern Territory Electricity Market

As rooftop solar and large-scale renewable generation continues to grow, timely and coordinated reforms to the NTEM will be required to mitigate risks emerging in the energy transition and develop a market that is fit-for-purpose. The reforms pose implications for the roles of multiple market participants and will have a significant and permanent impact on the operation of the NTEM.

KEY STATISTICS

24.3%
Households that have solar PV installed

312
Number of households with battery storage installed

19%
Total nameplate generation capacity that is renewable (incl. rooftop solar PV)

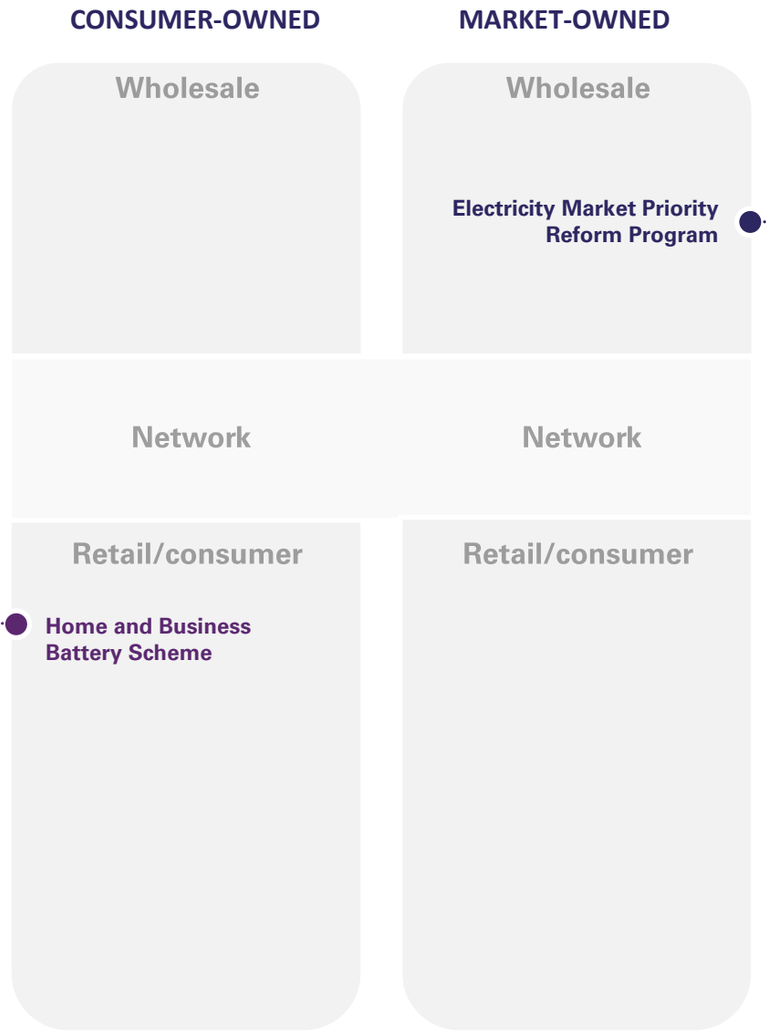
34%
Households renting in 2017/18

0.7%
Electricity customers on a hardship program

CHALLENGES AND TRENDS FACING NT

- The current Interim Northern Territory Electricity Market (NTEM) arrangements are inefficient, do not include provisions to optimise the use of energy and essential system services, cannot manage a number of plausible operational situations and will be unable to efficiently manage the increased amounts of solar generation.
- There is currently no formal system-wide standard for reliability of supply. This is an inefficient approach that is incompatible with a generation fleet comprising different technologies.
- Current arrangements assume that the government-owned generation company Territory Generation is the sole provider of all types of essential system services. Challenges associated with increased solar penetration have exposed shortcomings in the NT's current arrangements.
- Electricity networks in the NT operate in isolation from other states and each other, and cannot transfer generation or system support to or from neighbouring states. The NT power system must therefore stand-alone in maintaining security and reliability.

Northern Territory



The **Electricity Market Priority Reform Program** is a '**solving**'' policy that sets out a package of coordinated priority reforms to re-design the NTEM and unbundle the energy market. The changes include the introduction of a reliability standard, changes to dispatch and settlement arrangements and new arrangements for the essential system services provision.

The **Home and Business Battery Scheme** is an '**enabling**' policy that makes a $6,000 grant available to homeowners, businesses and not-for-profit organisations to fund the purchase and install of batteries and inverters.

Commonwealth

KEY INSIGHTS

Commonwealth policy making focus

Policy making at the Commonwealth level focus most significantly on market-owned generation assets. This may be due to Commonwealth policy makers having greater resources to facilitate large-scale initiatives, whilst state-based policy makers have a greater understanding of retail markets in a given jurisdiction and are better placed to implement consumer focused initiatives.

Balancing supply and demand in the energy transition

Both procuring new supply, and shifting the level and composition of the demand profile are viable tools to be used to address emerging challenges. Whilst new generation may be deemed essential to resolve urgent reliability issues, utilising the demand-side of the market may be a more efficient way to manage stress on the grid.

KEY STATISTICS

29%
Households that have solar PV installed

34,033
Battery systems installed since 2014

24%
Electricity generated by renewables in 2019

32%
Households renting in 2017/18

15,911 PJ
Total energy exports 2018-19

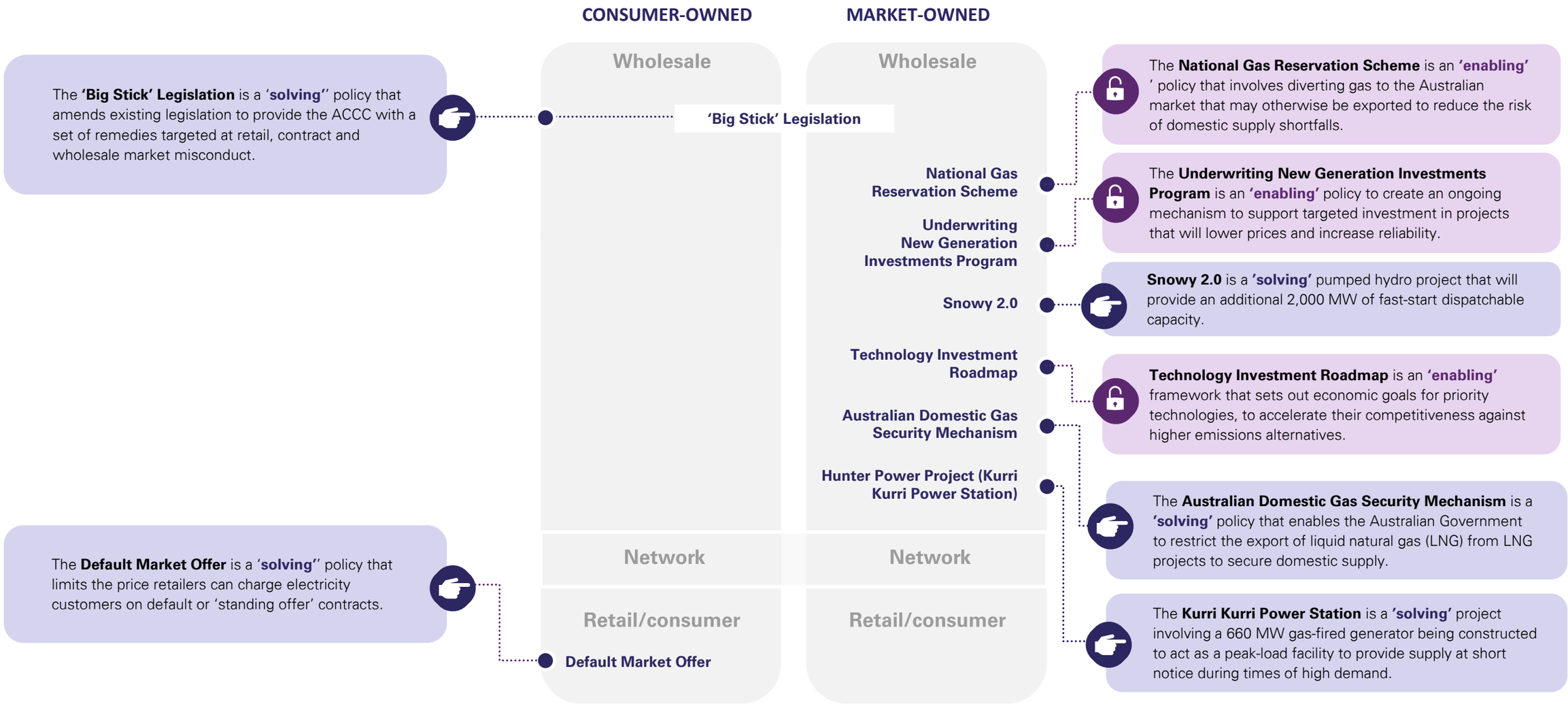
CHALLENGES AND TRENDS FACING AUS

Australia's energy system is undergoing two major transitions:

1. The transition from a carbon-intensive system to one that it net-zero, requiring system level changes to generation.
2. The consumer-centred transition to a decentralised system, shifting from a small number of large generators to a large number of consumer-owned generators.

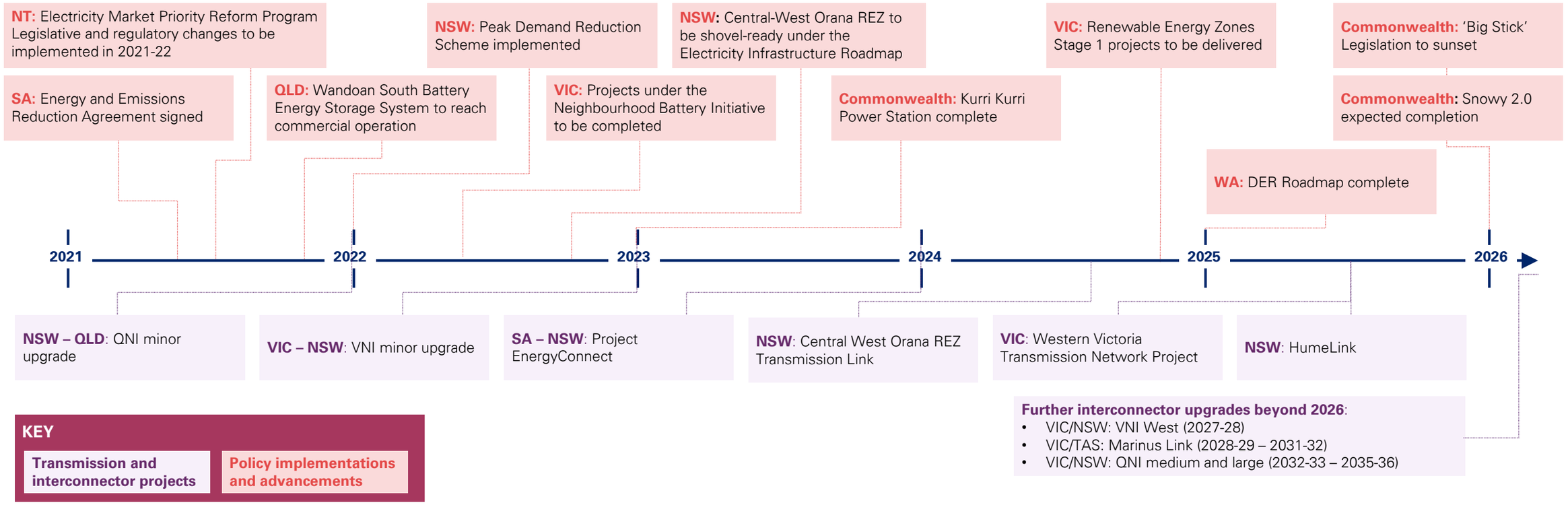
- The above transitions present common challenges for all states:
  - Maintaining a secure and reliable supply of energy as the demand curve becomes peakier, and the system becomes increasingly reliant on VRE.
  - Ensuring that the second transition includes all consumers, and certain consumer groups are not excluded or made worse off.
- As states face increasingly different pressures and set different goals, they seek to implement jurisdiction specific reforms.

Commonwealth



Policy implementations and transmission upgrades timeline

This report indicates a high level of policy development undertaken by state jurisdictions in recent times. This consists of policies that have been recently implemented, those that have been proposed and will be implemented in the future, and longer term strategic planning that will inform policy development and energy projects in the future. The timeline below indicates the key developments to take place across jurisdictions in the next 5 years, as well as the scheduled completion dates for key transmission and interconnector upgrades that will play a role in enabling many of the policies to effectively operate in future energy systems.



EMERGING ISSUES IN THE ENERGY LANDSCAPE

Gas in the energy policy landscape

Gas-fired generation is playing a balancing role, but its longer term outlook is unclear

As coal-fired power stations retire, and an increasing proportion of demand is served by intermittent renewable generation, the energy system will need to be supported to maintain security and reliability throughout the transition.

Gas-fired generation is one option to support the grid when wind or solar resources are not generating sufficient energy to meet demand. Alternatively, energy storage such as batteries and pumped hydro can also play a role in addressing reliability challenges associated with the intermittency of renewable generation.

Battery technologies are progressing towards commercial viability and learnings from recent and ongoing trials of large-scale, community-scale and household storage will be important in informing the role storage plays moving forward.

Gas may present an immediate solution to support the energy system through the transition, allowing the energy system to maintain a reliable supply of energy to serve demand.

Whether gas will be a transitional tool only, to be phased out post-decarbonisation – or a longer-term aspect of Australian energy systems remains unclear. This will be driven particularly by government policy, as well as the cost and availability of emerging alternative technologies, and the progress of each state towards decarbonisation and emissions reduction targets.

The role of gas in residential and small business energy consumption

The electrification of heating and appliances in homes is a first step underway in the transitioning environment for gas consumption. In the longer term, new gas connections to homes and businesses may be phased out, although the ACT is the only jurisdiction to commit to this pathway to date.

Managing this transition to limit the direct cost impacts for consumers, and protect vulnerable consumers who may not have the capacity to switch to alternative forms of energy, is an important aspect of the transition to be considered by policy makers.

The value of gas networks in the energy transition

Hydrogen will play an increasing role in Australia's future energy landscape, acting as a versatile energy resource that is an effective energy carrier that can be produced using renewable energy.

Converting existing gas infrastructure to deliver hydrogen blended with gas and store hydrogen is a strategy being pursued by network owners to maintain the value of their assets, and by governments as a means of achieving decarbonisation at the lowest cost.

Hydrogen and other associated emerging technologies such as carbon capture and storage remain at an early stage, however jurisdictions are beginning to place a focus on progressing their development. Even as gas consumption may decrease, gas network infrastructure may continue to play a role alongside emerging technologies.

The policy and regulatory environment for gas

Increasing the supply of gas remains a key aspect of policy design in some jurisdictions, particularly with respect to east-coast shortages. South Australia recently announced an agreement with the Commonwealth Government targeted at securing additional gas supply, similarly Queensland announced a new gas supply agreement between Origin and Australia Pacific LNG. The Commonwealth Government has introduced a gas security mechanism, and has proposed an additional gas reservation scheme.

In their final decision on the 2021-26 access arrangement for Evoenergy in the ACT, the Australian Energy Regulator approved the acceleration of the depreciation of new gas pipeline assets in the ACT and NSW.

This change allows for more of the costs of gas network services to be recovered from more consumers upfront, or in the present determination period. From a small consumer's perspective, the issue is affordability and how consumers without alternative options are protected from unsustainable increases in costs caused by increased capital recovery and a decreasing customer base from whom to recover these costs.

Although the role to be played by gas as the energy transition progresses further into the future remains uncertain, it is important that policy makers remain aware of the risks of over-procuring gas supply, and regulate gas networks to ensure that both consumers who continue to consume gas and those who do not are equally protected from price increases.

Energy policy in the wider economy

POLICY MAKING IN THE ENERGY SECTOR IS NOT ISOLATED IN ITS DEVELOPMENT OR IMPACT.

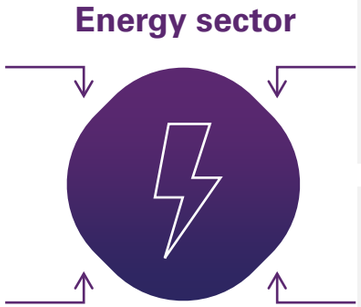
A number of other aspects of the economy are strongly interconnected with the energy sector, such that they influence policy development in the energy sector and are similarly impacted by changes in the energy landscape. Whilst the scope of this report focuses on policy initiatives in the energy sector, it is important to consider that the objectives targeted by jurisdictional energy policies are also impacted by policy making in other sectors, and a broad range of policy initiatives may be implemented by governments with a direct or indirect influence on energy sector outcomes. As the energy sector becomes increasingly distributed and decentralised, it cannot be viewed as operating in a stand-alone manner isolated from broader policy initiatives, and the energy strategies of jurisdictions must recognise the intrinsic role that energy policy plays in the economy as a whole.

Transport

- The transport sector is the largest energy consumer in Australia by industry, meaning all policy making in the transport sector will have significant implications for the network load curve.
- Electrification of vehicles: policies that influence the uptake and integration of electric vehicles in the transport network have implications for the energy sector through impacting charging loads and availability of electric vehicles as a demand flexible resource.

Telecommunications

- Energy costs represent a significant portion of the expenditure of telecommunications operators, therefore policy relating to the cost of energy consumption is likely to have a material impact on all bodies in the telecommunications sector.
- As the energy transition progresses, the growth of the network of distributed resources which have 'smart' capabilities and transmit data using telecommunications networks will further interconnect the energy and telecommunications sector.



Housing, urban and regional planning

- Policies in the housing sector such as building standards and tenancy laws are likely to impact on the decisions of consumers between home-ownership and renting, and often combine to result in properties that are not energy efficient or restrict consumer ownership of energy resources, shifting vulnerability onto renters.
- The design of urban and regional areas more broadly has a longer term impact on the energy outlook in terms of how public transport infrastructure and an increasingly shared economy may impact energy consumption, particularly in the context of the growing fleet of electric vehicles.

Income support

Policy regarding the level and availability of income support has implications for how customers are supported with respect to paying their energy bills, including the breakdown of:

- specific tailored assistance offered by energy retailers to customers, e.g. payment plans or hardship programs;
- jurisdictional government policies that target energy affordability; and broad based income support determined by the federal and state governments.

Electric vehicles in the energy policy landscape

Current policy landscape for electric vehicles

- To date, there has been limited federal guidance on policy making regarding electric vehicles (EVs). The Future Fuels Strategy released in February 2021 indicates the early focus of the Federal Government will be on commercial fleets and charging infrastructure.
- Policy making varies across state jurisdictions; areas of focus include: the development of fast-charging infrastructure, EV targets for government fleets, and subsidies and registration discounts to incentivise uptake of private EVs by small consumers.
- The deployment of trials investigating charging behaviour and facilitating coordinated charging are an important aspect of policy emerging in some states, albeit at an early stage of development.

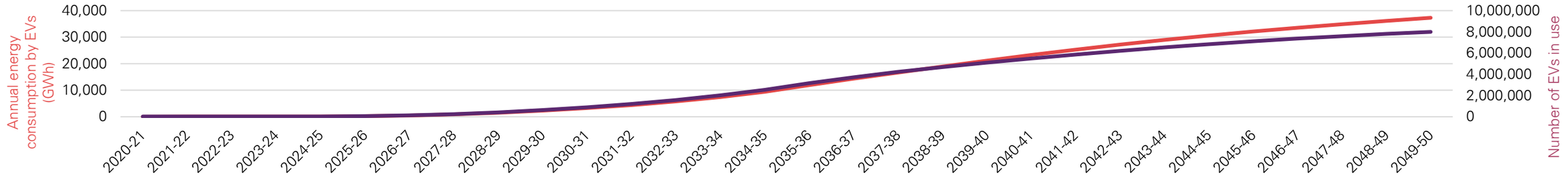
Challenges and drivers to optimise the integration of EVs into the electricity network

- Visibility of home charging: distribution network service providers being aware of charging patterns behind the meter is a key aspect of efficiently forecasting and managing demand as EV penetration increases.
- Peak demand management: will play a key role in addressing potential capacity challenges and mitigating the need for infrastructure upgrades to cope with EV charging load at times of peak demand.
- EV adoption forecasting: currently, it is difficult to forecast the pace of EV uptake and future charging behaviours, which poses challenges as to how best to integrate EVs into the network in the medium and long term.
- Financial barriers to the investment case for public charging infrastructure: developing public charging infrastructure is a key driver of EV uptake, however high costs and potential free rider issues detract from investment in the current landscape.
- Grid integration standards: Australia currently lacks a national framework to provide consistency in the approach to integrating EVs, which would provide significant value in facilitating the consistent integration of electric vehicles.

Future outlook for electric vehicles

- A great deal of uncertainty regarding future policy direction, technology costs and consumer preference shifts remains a restrictive factor to developing precise forecasts of how significant the impact of EVs will be and when it will materialise.
- AEMO's modelling suggests that EV uptake will remain relatively limited until the late 2020s, and accelerate in the 2030s due to falling vehicle costs and greater access to charging infrastructure.
- EV charging will represent a significant load on the network, under AEMO's central scenario EV consumption is forecast to contribute between 15.7 and 24.8% of operational demand in NSW, QLD, SA and VIC by 2048-49. This additional load may present challenges to the network if most consumers prefer to charge during periods of peak demand.
- Electric vehicle batteries represent an alternative form of energy storage, providing a valuable consumer-owned demand flexible resource. Consumers may adopt coordinated, managed or smart charging behaviour to support the network, by charging and discharging energy from their EV batteries at different times. Realising the full potential of this opportunity will depend on providing effective incentives that motivate and reward consumers for shifting their consumption, including through time-of-use tariffs and 'solar sponge' tariffs, as well as integrating vehicle-to-grid technologies into the electricity network.

FIGURE 3 – FORECAST UPTAKE AND CONSUMPTION OF ELECTRIC VEHICLES IN THE NEM



Impact of COVID-19 on jurisdictional energy policy

Impact on energy consumers

The COVID-19 pandemic has been a major focus from the second half of 2019-20 and throughout 2020-21. The resulting restrictions on economic activity have had a major impact on consumers.

The AER is collecting additional data to monitor debt levels. It publishes aggregate data from across the NEM, but notes this may be incomplete because debt levels have a lag time of over 90 days, and payment plan and hardship data does not pick up alternative deferred payment options.

As reported by the AER, in Q4 2019-20 hardship program entries were down by over a third relative to Q4 2018-19. Retailers suggested this drop may have been a result of government subsidies softening the early impact. In addition, many customers took up debt deferral arrangements instead of payment plans and hardship programs.

Later observations indicated an increase in the proportion of customers in electricity debt and the average electricity debt level. Increased debt is the result of two factors – increased residential demand (with more people spending more time at home) and a lower ability to pay (many have lost employment and are relying on government support). Reported debt levels may increase further, firstly because of the lag in billing data and secondly due to COVID-19 related government income support programs being reduced or ending.

Impact on demand trends

In relation to demand patterns, AEMO noted the following impacts of the pandemic:

- COVID-19 influenced the shape of demand, with a significant reduction in the morning, partially offset by small increases in daytime demand and a higher evening peak.
- The increased residential proportion of demand resulted in greater temperature sensitivity. For example, in periods of cold weather Victoria's underlying demand during the pandemic has been higher than pre-pandemic.

COVID-19 is likely to have an ongoing impact on usage patterns, for example, due to permanent shifts in work from home arrangements. Furthermore, COVID-19 is expected to have an ongoing impact in reducing net overseas migration, resulting in an estimated one million fewer consumers in Australia by 2030 relative to pre-COVID estimations.

Retailers have been asked to take on additional responsibility

The AER's Statement of Expectations asks retailers to:

- offer a payment plan or hardship arrangement to all residential and small business customers who may be in financial stress;
- not to disconnect residential customers if they have contacted the retailer, and
- not disconnect small business customers that are adhering to a payment plan.

These expectations applied until 30 June 2021. The AER has developed a standby statement that may be applied in the event of 'stay-at-home' orders being implemented beyond 30 June 2021.

Network service providers are also still recovering from disruption due to some scheduled outages being postponed or cancelled to support consumers throughout COVID-19.

Jurisdictional responses to support consumers through COVID-19 include:

VICTORIA
A $250 Power Saving Bonus one-off payment to provide direct support to vulnerable households experiencing energy bill stress due to the pandemic.

NSW
NSW extended Energy Accounts Payment Assistance eligibility to customers having difficulty paying household energy bills because of a short-term financial crisis or emergency, such as reduced income due to COVID-19.

QLD
More than 2 million households received a $200 rebate in 2020 to help offset household electricity and water costs.

NT
The NT Government has announced a Hardship Relief Package for businesses impacted by the COVID-19 situation. Businesses that demonstrate substantial hardship may be eligible to receive 50% off their electricity bills for six months.

WA
A one-off $600 credit was applied from 1 November 2020 to reduce electricity bills for residential customers. It was also announced a $500 electricity offset to support small businesses impacted by the five day lockdown. This is in addition to one-off $2,500 credit on electricity bills applied to small businesses that consume less than 50MWh/annum.

ACT
A one-off $200 concession was provided to Utilities Concession holders, and the government committed up to $250,000 to a fund to assist COVID-19 impacted households.

TAS
The Tasmanian Government approved a 12 month price increase cap on electricity bills and a waiver for small business customers on their next bill in April 2020.

SA
Various support packages were provided through retailers, rather than from the SA Government.

Data sources used for this report

Percentage of households that have solar PV installed

NSW, VIC, QLD, WA, SA, TAS, ACT, NT
- Australian PV Institute, Solar PV Status

Commonwealth
- Clean Energy Regulator, Postcode data for small-scale installations

Number of households with battery storage installed, solar PV systems with concurrent battery storage

NSW, VIC, QLD, SA, TAS, ACT
- AEMO DER Register, DER Data Dashboard – number of residential battery units

WA, NT, Commonwealth
- Clean Energy Regulator, Postcode data for small-scale installations

Electricity generated by natural gas and coal

Commonwealth
- Department of Industry, Science, Energy and Resources, Australian Energy Statistics, Electricity generation by fuel type, June 2021

Energy imports data

NSW, VIC, QLD, SA, TAS
- Australian Energy Regulator – Wholesale Markets Quarterly, Q1 2021 – Wholesale electricity markets data

Renewable generation stock

NSW, VIC, QLD, SA, TAS, ACT
- Australian Energy Market Operator – NEM Generation Information, May 2021
- Australian Energy Market Operator – 2020 Inputs Assumptions and Scenarios Workbook

WA
- WA Government, Energy Transformation Taskforce – Whole of System Plan

NT
- Utilities Commission NT – Review of the NT Generator Performance Standards, 2019
- Utilities Commission NT – Northern Territory Electricity Outlook Report, 2018-19

Commonwealth (electricity generated by renewables in 2019)
- Department of Industry, Science, Energy and Resources, Australian Energy Statistics, Electricity generation by fuel type, June 2021

Households renting in 2017/18

NSW, VIC, QLD, WA, SA, TAS, ACT, NT, Commonwealth
- Australian Bureau of Statistics – Survey of Income and Housing, 2017-18

Electricity customers receiving tailored assistance/on a hardship program

VIC
- Essential Services Commission – Victorian Energy Market Update, June 2021 (pg. 14)

NSW, QLD, SA, TAS, ACT
- Australian Energy Regulator – Annual Retail Markets Report 2019-20 (pg. 81-82)

WA
- Economic Regulation Authority – Annual data report 2019/20, Energy retailers (pg. 22)

NT
- Utilities Commission NT – NT Electricity Retail Review, 2019-20 (pg. 25)

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In preparing this report, we have had access to information provided by ECA, and publicly available information. We have relied upon the truth, accuracy and completeness of any information provided or made available to us in connection with the Services without independently verifying it.

Any findings or recommendations contained within this report are based upon our reasonable professional judgement based on the information that is available from the sources indicated. Should the project elements, external factors and assumptions change then the findings and recommendations contained in this report may no longer be appropriate. Accordingly, we do not confirm, underwrite or guarantee that the outcomes referred to in this report will be achieved.

We do not make any statement as to whether any projections will be achieved, or whether the assumptions and data underlying any such prospective financial information are accurate, complete or reasonable. We will not warrant or guarantee the achievement of any such forecasts or projections. There will usually be differences between forecast or projected and actual results, because events and circumstances frequently do not occur as expected or predicted, and those differences may be material.