

WORLD ENERGY MARKETS OBSERVATORY

Australia Retail

Nicole Alley
Emilie Ditton
Alexandra Luxton
Shaila Pervin
Nupur Sinha
Ishan Deep





Energy demand in Australia declined overall in 2020 due to Covid-19

Energy demand in Australia declined in 2020. There was a drop in commercial load as businesses closed during lockdowns. This was partly offset by a rise in household consumption. Falling international fuel prices contributed to lower energy prices in local markets.

Maximum energy demand declined in response to Covid-19

- Covid-19 caused a decline in overall electricity demand. Cultural and recreational services were restricted across all states during lockdown periods, which led to decreased commercial and industrial demand.
- Residential demand for electricity increased and offset the decrease in commercial demand.
- Many Australians adapted to remote working and some moved away from CBDs altogether. As a result, energy demand has shifted from the CBD to outer suburbs and regional cities, resulting in a more decentralized demand profile.
- Before 2025, higher residential sector demand partially offset lower electricity demand from the commercial and industrial sectors.

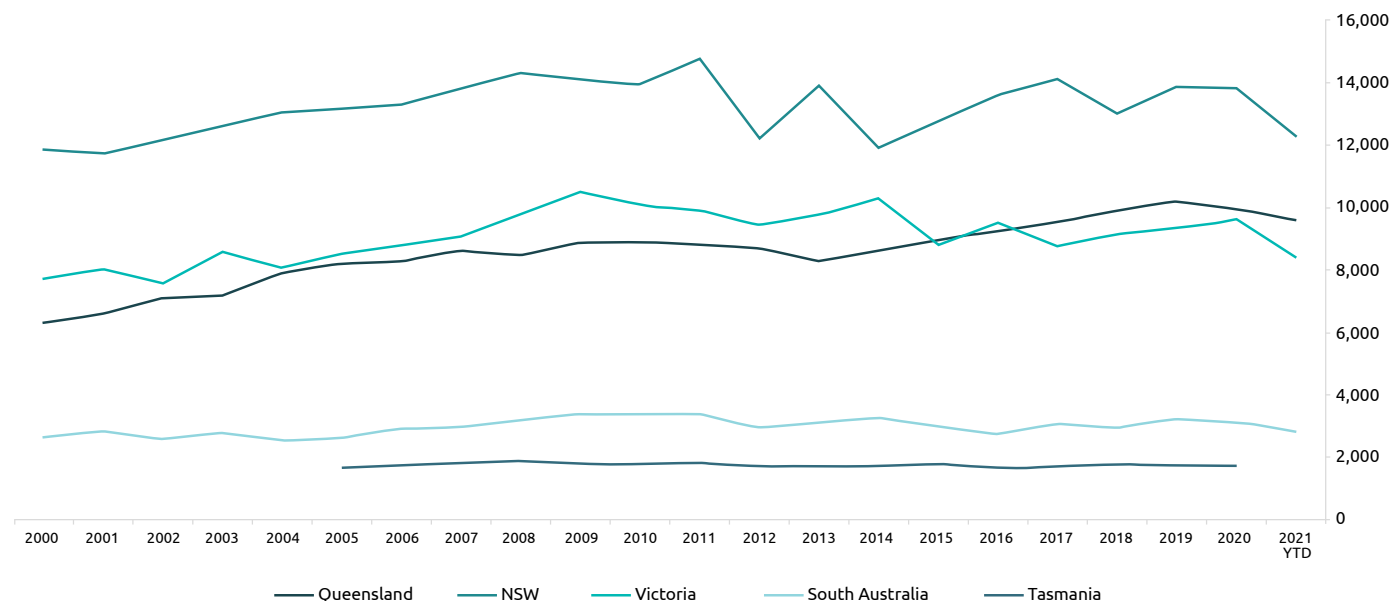
Managing minimum demand was the major challenge in 2020

- A key challenge for the Australian Energy Market Operator (AEMO) over 2020 was managing minimum demand.

- South Australia (SA), Victoria (VIC) and Queensland (QLD) all recorded their minimum demand in 2020 was approximately at noon. This was driven by mild temperatures and high rooftop solar generation.
- In VIC, demand fell to its lowest level in history of 2,539 MW on Christmas Day 2020.

FIGURE 1

Maximum grid demand by region



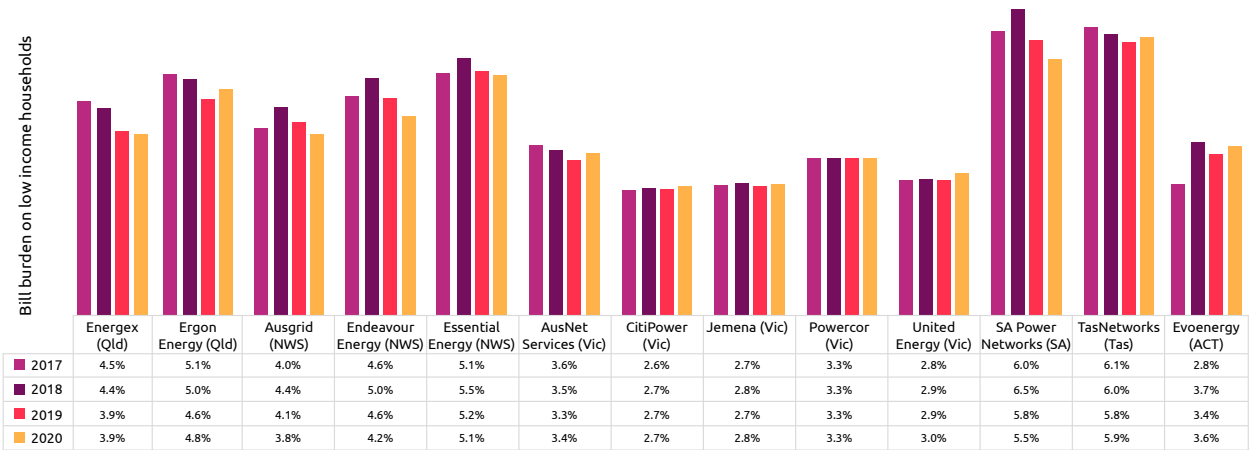
State of the energy market 2021 Source: Clean Energy Australia 2021 report Data
Link - <https://www.aer.gov.au/publications/state-of-the-energy-market-reports/state-of-the-energy-market-2021-data>



Electricity affordability remains a key concern with an increase in residential demand due to the pandemic

In line with global trends, residential consumption rose significantly during lockdowns. Colder weather in some states was a contributing factor. At the same time, business consumption plummeted.

FIGURE 2
Electricity bill burden on low income households



Household electricity affordability remains elevated.

- Power costs remain an issue in Australia, despite affordability had improved for some customers due to lower 2020 wholesale prices.
- In comparison to average income households, energy costs, as a proportion of income, doubled for some low-income households.
- In June 2020, electricity costs rose slightly to 2.7–5.9% of disposable income for low-income, energy bill concession households on the median market offer (compared to 2.7–5.8% in 2019).

Electricity affordability varies by state.

- In 2020, Tasmanian low-income households have the highest electricity costs to income ratio. The colder climate drives higher demand for heating. Low gas penetration is also a contributor.
- SA low-income households also experienced a relatively high average electricity costs to income ratio. In the National Electricity Market (NEM), SA has the second lowest electricity use, and its electricity prices were 16–49% higher than in other NEM regions.
- The Australian Capital Territory (ACT) had the most affordable electricity costs as a percentage of disposable income. They had relatively low electricity prices and higher average incomes.

“The pandemic is exacerbating energy affordability concerns. At a time when many consumers are experiencing reduced incomes, increased electricity consumption could lead to rising household debt and financial strain”,

Rod Sims, ACCC Chair

“We remain concerned about the level of residential debt, as detailed in this report, with a 16% increase in the number of customers in debt as of December 2020 compared to the previous year, and their average debt up by more than A\$200”,

Clare Savage, AER Chair

While wholesale prices continued to drop, the average residential energy bill increased due to the increased residential consumption

Residential consumers' electricity consumption increased significantly during the pandemic. Small businesses were severely disrupted, and their consumption decreased.

Wholesale power prices fell.

- Wholesale electricity prices fell to a five-year low in 2020. Between June 2018 and February 2021, median market offer prices for residential customers fell by 8–16% in QLD, 10–18% in New South Wales (NSW), 7–10% in VIC, 19% in SA, and 4% in the ACT.
- The states with the most renewable energy enjoyed the most significant wholesale price falls. Tasmania (TAS) recorded a 67% reduction, and SA's wholesale price fell below NSW's and VIC's for the first time in 7 years.

Power bills increased in residential however fell for small business customers.

The economic effects of the pandemic meant that many Australian households faced difficulties paying their electricity bills in 2020. When the crisis was at its worst, more than 1,000 customers per week sought payment assistance from their electricity retailers.

Installation of rooftop photovoltaic (PV) systems, primarily on residential and commercial buildings, and combined heat-and-power systems in industrial and some commercial applications, will account for more than 7% of total electricity generation by 2050, almost doubling the 2020 share of on-site power generators.

On average, residential customers across Australia experienced a 7% increase in their median Q3 quarterly bill. It increased from A\$310 in 2019 to A\$332 in 2020.

- The exception was in south-east QLD where residents benefitted from their Government's Covid-19 economic relief package. Their median quarterly bill decreased by 12% (A\$33), even though consumption increased by 6%.
- In VIC, the median quarterly residential bill increased the most at 13% (A\$40), followed by NSW at 11% (A\$37).

- In SA, the median quarterly bill increased the least at 2% (A\$9).

On average, small business customers across Australia experienced a 16% decrease in their median Q3 quarterly bill. It declined from A\$554 to A\$467.

- VIC had the biggest decrease at 19% (-A\$104), followed by NSW at 15% (-A\$90).
- In south-east QLD, the median bill decrease was 14% (A\$73), despite the consumption rate had decreased at a smaller rate compared to VIC and NSW.
- In SA, the median bill decreased the least at 8% (-A\$34).

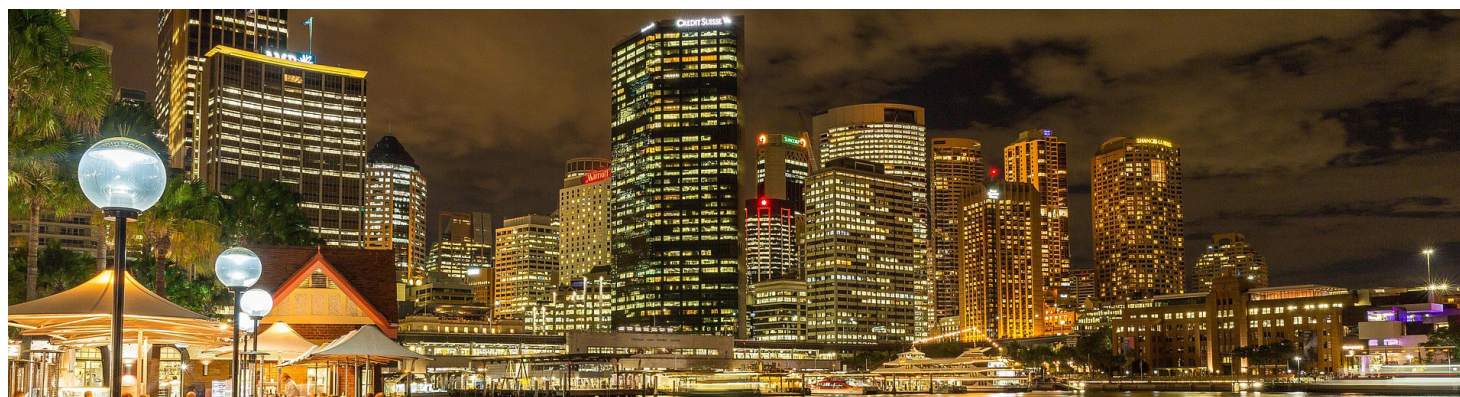


FIGURE 3

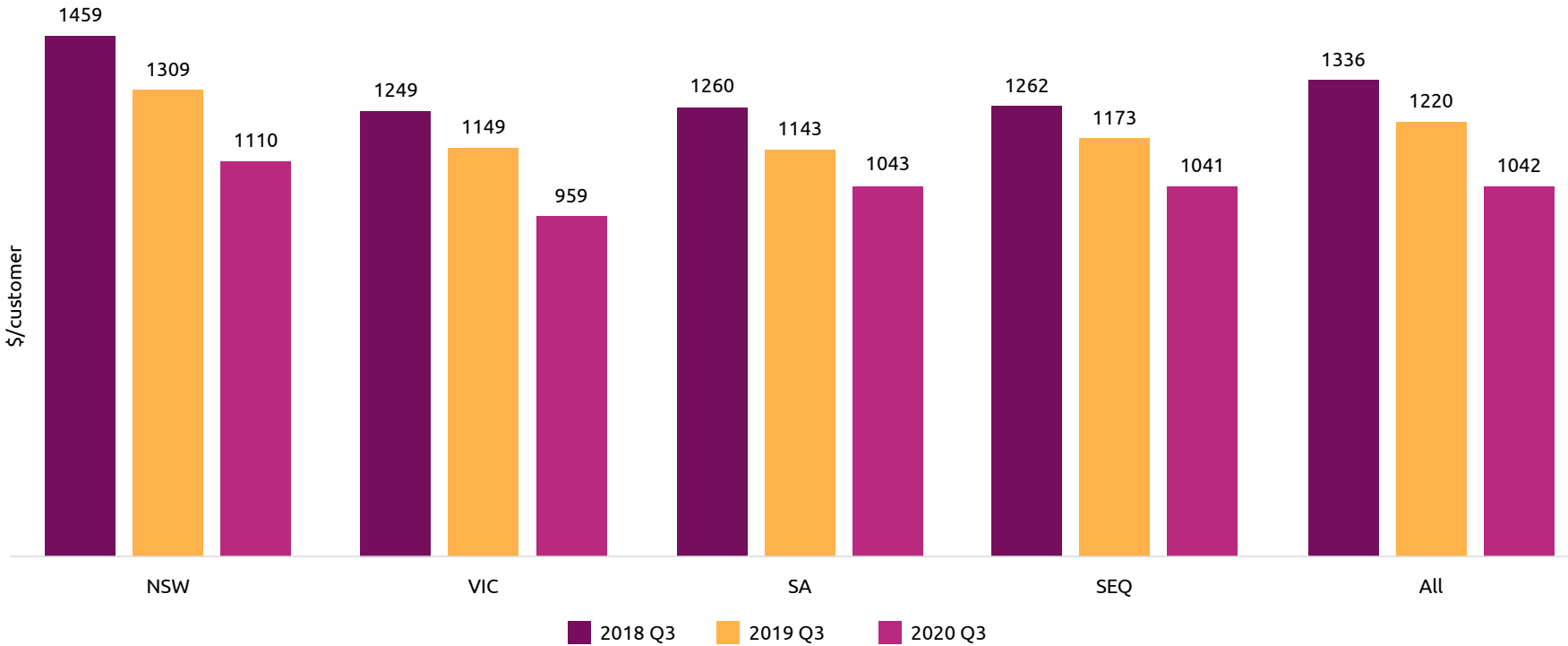
Quarterly bills for residential customers



Source: ACCC - Inquiry into the National Electricity Market
 Link: <https://www.accc.gov.au/system/files/Inquiry%20into%20the%20National%20Electricity%20Market%20-%20May%202021%20report%20v2.pdf>

FIGURE 4

Quarterly bills for small business customers



Source: ACCC - Inquiry into the National Electricity Market
 Link: <https://www.accc.gov.au/system/files/Inquiry%20into%20the%20National%20Electricity%20Market%20-%20May%202021%20report%20v2.pdf>



State and Federal Governments, as well as energy providers in Australia, supported consumers by ensuring affordable access to power and offering bill support in response to Covid-19

Federal Government

- In June 2021, the Australian Energy Regulator (AER) introduced the Statement of Expectations to provide extra pandemic protection and support. The AER continues to monitor the rapidly changing situation across all National Energy Customer Framework (NECF) jurisdictions.
 - In July 2021, a new standby statement applied to areas affected by stay-at-home orders in NSW. It provided additional protection for residential and small business customers until two weeks after the stay-at-home orders ended.
- In June 2021, the Federal Government committed to ensuring households and businesses could continue to access energy at an affordable price. The AER released compliance and enforcement priorities for 2021-22, including:

- Effective identification of consumers in financial difficulty and payment plans offers that consider their capacity to pay;
 - Consumer access to Ombudsman schemes;
 - Registered generators' compliance with AEMO dispatch instructions and compliance with their latest offers;
 - Ensure service providers meet information disclosure obligations and other Part 23 National Gas Rules obligations;
 - Ensure timely and accurate gas auction reporting by registered participants.
- In May 2021, the Federal Government invested more than A\$1.8 billion in the 2021-22 Budget to boost jobs, reduce emissions, and support affordable, reliable energy. Minister for Energy and Emissions Reduction, Angus Taylor said, "the Budget is supporting the Government's responsible and pragmatic approach to energy policy and emissions reduction, setting Australia up for a prosperous future as the economy continues rebuilding from the Covid-19 pandemic."
 - In April 2021, the Federal and SA governments signed a A\$1.08 billion State Energy and Emissions Reduction Deal. It will deliver secure, reliable and affordable energy to SA and help Australia continue to meet and exceed its emissions reduction targets.

- Prime Minister Scott Morrison said, "This agreement will support investment and more jobs in South Australia and will be a key driver of our economic recovery from Covid-19."
- Minister for Energy and Mining, Dan van Holst Pellekaan said, *"The inclusion of gas supply targets and regulatory reform actions in the agreement builds on the measures the Government has outlined as part of our gas-fired recovery from Covid-19"*.

"People enter into a contract when they sign up with an energy retailer. But businesses also have a deal, a social contract, with the community in which they operate,"

Clare Savage, AER Chair

State Government and Energy Companies

- In June 2021, the QLD Government announced a A\$2 billion investment into renewable energy and hydrogen through the 'Queensland Renewable Energy and Hydrogen Jobs Fund', as part of the Government's Covid-19 Economic Recovery Plan which increases the existing A\$500 million Queensland Renewable Energy Fund by A\$1.5 billion.

- Several State and Territory governments also introduced Covid-19 support packages for households.
 - In QLD, households received a A\$200 utility payment to assist with their electricity and water bills.
 - In the ACT, holders of a utility concession received a A\$200 rebate on their electricity bill.
 - The TAS Government capped price increases in energy bills for 12 months.
- In April 2020, energy networks across NSW, VIC and SA (Ausgrid, AusNet Services, CitiPower and Powercor, and SA Power Networks) announced a suite of measures to provide support to customers enduring hardship as a result of the pandemic. Discounted bills were provided from the start of April to the end of June 2020, where consumption was less than 25 per cent of 2019 levels. More than 600,000 customers were affected. Key objectives included:
 - Tariff relief for small and medium-sized business customers impacted by Covid-19;
 - Incentivizing all retailers to offer affected customers payment plans;
 - Ensure viability of small retail businesses;
 - Support retail competition.
- Large energy retailers also extended payment terms and suspended disconnections for customers experiencing hardship.





Although energy consumers experienced a significantly higher number of planned outages in 2020, the performance indices highlight stable and improved network reliability compared to 2019 when bushfires caused significant power disturbances

2020 was a much less eventful year for power suppliers in Australia. Milder weather and the absence of serious bushfires in 2020 meant improvements to the energy supply.

In 2020, the total minutes of supply increased on average, but so did the frequency and duration of planned supply interruptions.

- In 2020, the average customer experienced significantly more total minutes off supply compared to 2019. This increase was driven primarily by the impact of the devastating bushfires which burned throughout the spring and summer of 2019–20. The bushfires destroyed thousands of homes and burned over 17 million hectares of land across NSW, VIC, QLD, ACT, Western Australia (WA) and SA.

- On average, in 2020, the distributors performed 17% better than their weighted System Average Interruption Frequency Index (SAIFI) targets and 3% better than their weighted System Average Interruption Duration Index (SAIDI) targets.
- According to the AER, across the NEM, lost supply events due to transmission failures have occurred 25 times or less per year since 2006. Since 2018, the unplanned minutes off supply has been increasing and increased by 27% in 2020 compared to 2019.

Coal fired generation outages

- Major unplanned outages in 2020–21 included Yallourn unit 1 (360 MW), offline for 4 months from July; Stanwell Unit 2 (365 MW), offline for almost 3 months from 20 December 2020; and Liddell Unit 3 (500 MW), offline for most of the 2020–21 summer following a significant transformer incident on 17 December.

“58% of household consumers and 64% of business consumers are worried that there will be frequent electricity outages in 10-20 years’ time”

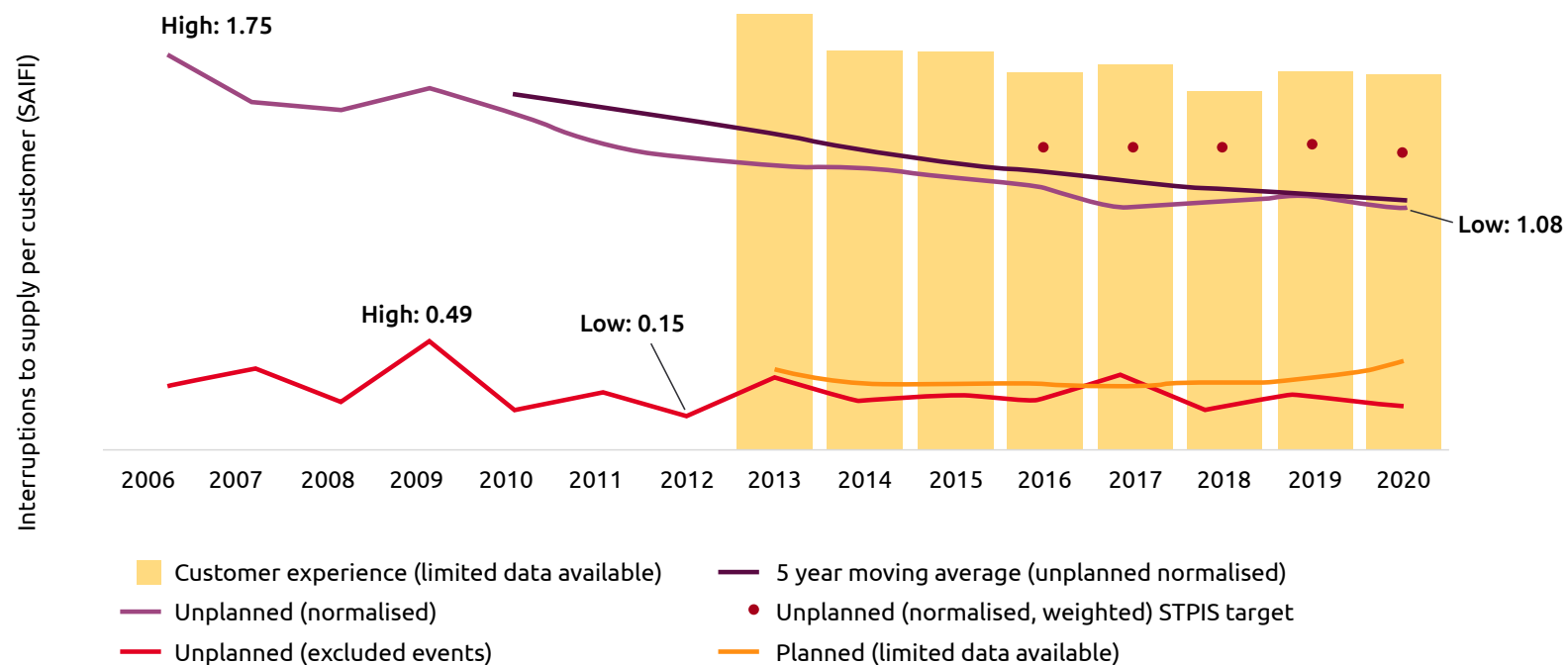
Energy Consumers Australia 2021

“When there’s an upgrade to the network, cutting back trees or repairing outages, our teams are communicating with customers and our crews are working on the ground,”

*Andrew Dillon,
Chief Executive Officer Energy Networks Australia*

FIGURE 5

Interruptions to supply (SAIFI) – electricity distribution networks

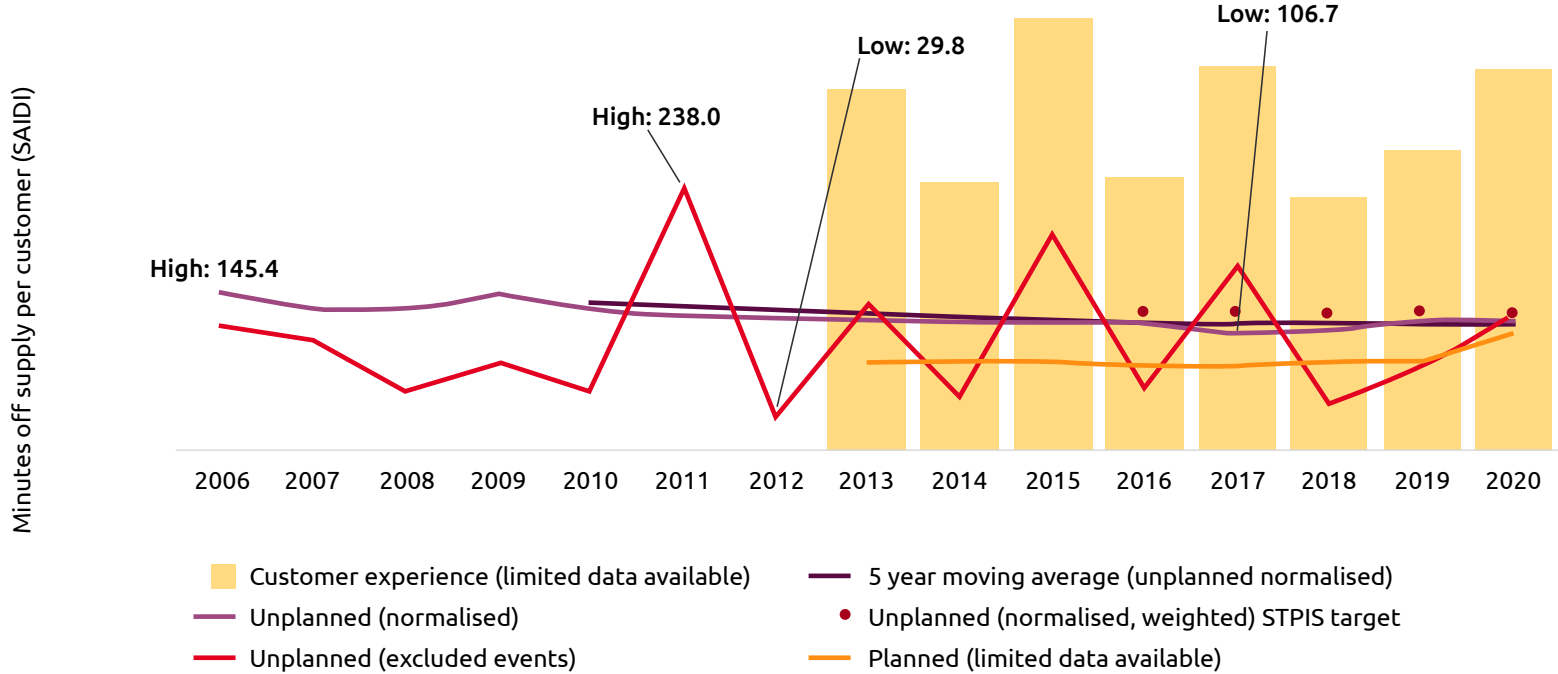


Source: State of the energy market 2021 data

Link: <https://www.aer.gov.au/publications/state-of-the-energy-market-reports/state-of-the-energy-market-2021-data>

FIGURE 6

Minutes off supply (SAIDI) – electricity distribution networks



Source: State of the energy market 2021 data
 Link: <https://www.aer.gov.au/publications/state-of-the-energy-market-reports/state-of-the-energy-market-2021-data>



Reduction of outages is still one of the most critical issues for electricity consumers

Outage management is a critical connecting point between grid operations and customer experiences with their retail energy providers. Lack of visibility, lack of communication and the inability to respond immediately to power outages continues to be a critical issue for power companies and is one of the key drivers of power customer dissatisfaction. Increased intelligence and automation within the distribution network will improve visibility for power companies, but critically, so is providing an interconnection of systems and data, e.g., creating a connection between Advanced Distribution Management System (ADMS), customer relationship management (CRM), billing and usage to provide the level of visibility expected by power consumers in the event of an outage.

Two examples of recent electricity supply outages handled promptly by the utilities affected.

QLD was hit by widespread power outages after fire and explosions at Callide power station in May 2021

- Fire occurred in one of the turbine halls at CS Energy's Callide power station. As a result, the three units that were generating at the time went offline.

- The outage impacted 470,000 customers, of which 380,000 customers were in south-east QLD and 90,000 customers in regional QLD. In total, there was a loss of 3,100 megawatts of generation in QLD
- Response actions:
 - Powerlink, Energex and Ergon Network teams worked to progressively restore power as soon as it was safe to do so.
 - In response to the shortfall in available generation heading into the evening peak demand period, AEMO issued an actual Lack of Reserve 2 (LOR) notice and a forecast LOR3 notice identifying the potential for electricity demand to exceed supply in QLD.
 - QLD customers were also asked to voluntarily reduce their energy usage to assist in managing demand on the network. This notice was later cancelled due to sufficient power supply from generators returning to service around the state.
 - As a result of the action, power was progressively restored throughout the afternoon and the number of impacted customers continued to reduce. All south-east QLD customers affected by the power station issue were resupplied within two hours.

Mass blackout that left 100,000 WA homes in the dark in Jan 2021

- A fire at a privately owned power station sparked an outage which left approximately 100,000 homes and businesses across Perth, Kalgoorlie and Geraldton in the dark for several hours. The event was reportedly triggered by a generator in Kwinana failing to generate.
- Approximately 100,000 customers were affected by the load shedding. Suburbs across inner and greater metropolitan Perth were affected. Effect of that failure on the network led to two further failures at other power stations including Badgingarra Wind Farm and at a power station in Worsely, near Collie in the south-west.
- Response actions:
 - When the incident occurred, Western Power began "load shedding" (rolling blackouts) to prevent damage to the electricity network.
 - Firefighters were called to a power station on Leath Road in Kwinana following reports of a smouldering bearing in a turbine.
 - Almost 30 firefighters attended the power station and extinguished the fire with guidance from power station staff.
- As a result of the action, Western Power could restore power to approximately 80,000 homes within 4 hours.



Energy competition is increasing in Australia, and customer perceptions of energy providers are improving, however Australia's energy retailers experience some of the highest customer churn rates in the world, although recent trends indicate churn rates are declining

In Australia, consumer perceptions of their retail energy providers are historically low compared to satisfaction of retail customers of other industries. Customer satisfaction of their energy retailers are driven by factors including reliability, price, value for money, customer service, technology uptake and ability to switch.

Five states - QLD, NSW, SA, TAS and the ACT – apply a common national framework for regulating retail energy markets. VIC already has regulatory arrangements that are broadly consistent with the national framework.

Australian Energy retailers can be organized in different tiers:

- Tier 1 includes the big three: AGL Energy, Origin Energy and EnergyAustralia, which supply 64% of small electricity customers and 73% of small gas customers.

- In Tier 2, three retailers have significant market share in some regions:
 - Snowy Hydro supplies around 7% of electricity customers and 9% of gas customers. Its market share is highest in VIC, supplying 13% of electricity customers and 14% of gas customers.
 - Alinta Energy supplies 5% of electricity customers and 3% of gas customers. Its market share is highest in QLD, with 9% of electricity customers and 1% of gas customers) and SA (6% of electricity customers and 5% of gas customers).
 - Simply Energy, supplies 4% of electricity customers and 6% of gas customers, including 9–10% of customers in VIC and SA. It is the third largest energy retailer in SA.
- Smaller retailers, gained market share in recent times, increasing from 5% of small electricity customers in 2016 to 8% in 2020.

New participants have emerged in the Australian Electricity Market.

- Since 2020, 11 new retailers have been authorized to retail electricity and 2 to retail gas. 5 new companies commenced selling electricity.
- 16 new retailers were authorized to sell electricity and 5 were authorized to sell gas in 2019–20. These are:

- Electricity Retail: Localvolts, SmartestEnergy Australia, CleanTech Energy, CleanCo Queensland, Active Utilities Retail, Energy On, Energy Services Management, Radian Holdings.
- Gas Retail: Energy On, Discover Energy, OVO Energy, Humenergy Group and Tas Gas Retail

Customer churn rates in Australia

Some Australian retail power markets witness the highest rate of market churn, i.e. the number of customers who change their energy providers, in the world. With many new providers in the market, margins have already been squeezed to the minimum. Australian utilities must identify new ways to attract new customers at a workable cost, service existing customers more efficiently and reduce customer churn.

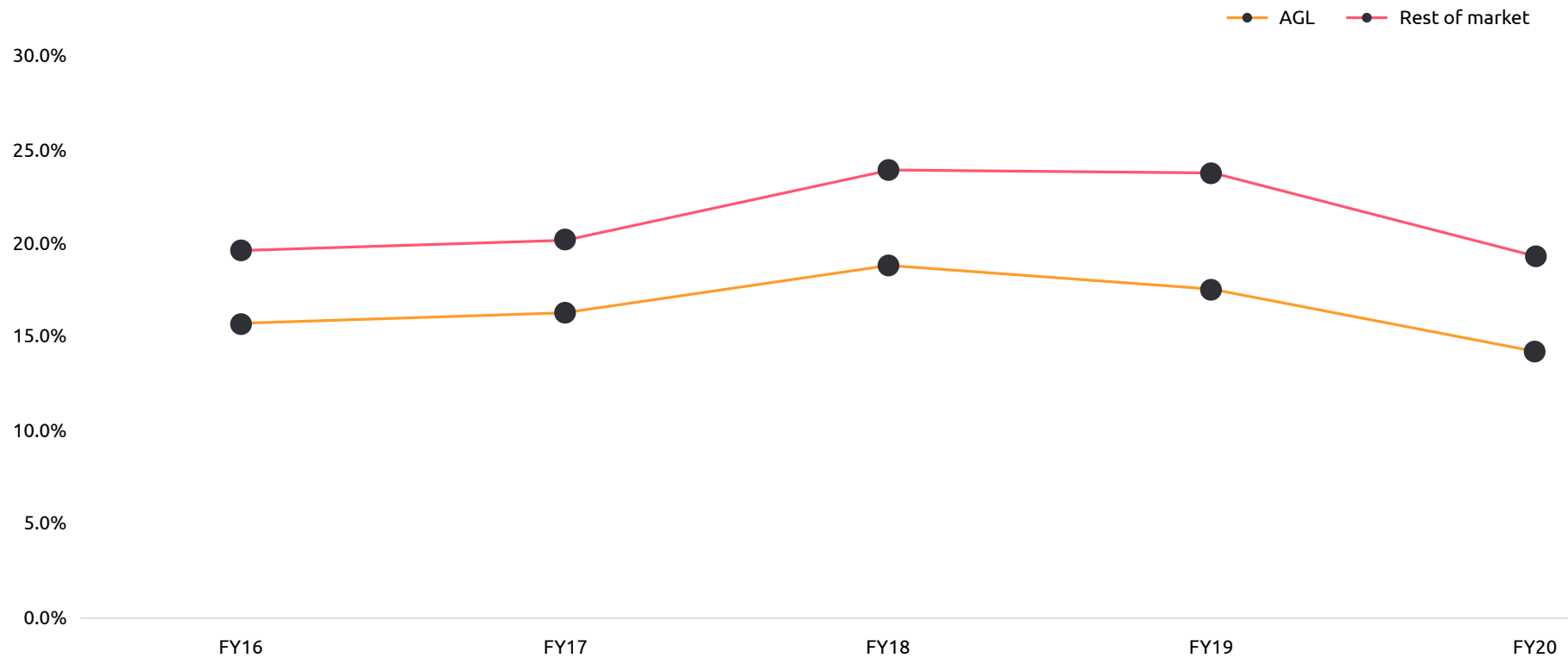
AGL stated a significant drop in churn numbers during FY20 due to Covid-19. AGL's churn rate has dropped to 14.3% in FY20 which is still lower than average churn experienced in the rest of the market.

"The latest assessment of consumer sentiment shows record levels of satisfaction with energy retailers and a "growing belief that consumers are getting better value for money". It represents the culmination of a positive trend since 2017"

Carl Kitchen, Australian Energy Council

FIGURE 7

AGL Churn Rate compared to rest of the market - FY2016 - FY2020



Source: AGL
Link: <https://www.2020datacentre.agl.com.au/customers/customer-churn>



Renewable growth will have an enormous disruptive impact on all parts of the Australian energy ecosystem over the coming years

In Australia, consumer perceptions of their retail energy providers are historically low compared to satisfaction of retail customers of other industries. Customer satisfaction of their energy retailers are driven by factors including reliability, price, value for money, customer service, technology uptake and ability to switch.

Impacts of renewable growth on the Australian energy ecosystem

- **Negative Wholesale Prices:** With more low-priced renewable generation operating at times of low demand, the incidence of negative prices has increased. In 2020, there was a record number of negative prices NEM-wide, with 3,662 instances of negative spot prices across the five Australian NEM regions. Over 40% of these occurred in the fourth quarter, where prices reached a record low daily average in VIC, SA and TAS. Nearly half of all instances of negative prices in 2020 occurred in SA.
- **Reduced Customer Cost:** As an example of reducing customer cost of energy services resulting from renewable growth, according to the Clean EnergyAustralia Report 2021, SA's increased renewable

energy generation has translated into significant price reductions, with the state recording the lowest wholesale prices in the NEM for the last four months of 2020. In recent years, the phenomenal growth of rooftop solar resulted in record low demand for grid power in several states in 2020. While this is a positive development for emissions reduction and electricity prices, it also makes it increasingly difficult to maintain the security of the electricity system.

- **Risks to System Security:** The transition to a more renewable generation mix poses twin challenges to system security.
 - Firstly, inverter-based resources such as wind, solar PV and batteries have only recently been configured to support frequency control and provide system strength in the same way as coal, gas and hydro plants. But more work is required to procure and integrate these services from inverters. Secondly, those resources require system strength to ride through faults and meet performance standards.
- **Whole of system plan (WoSP) modelling:** The WoSP is a 20-year outlook and detailed plan developed by Western Power, the State Government, EPWA and AEMO. It documents how the generation, management and distribution of energy in the south-west interconnected system will change over the next few decades, and what needs to be done to respond, such as the investment or infrastructure required. The

WoSP modelled four scenarios for WA's main grid, with renewables expected to account for at least 70% of generation capacity under all four scenarios by 2040.

Wind was the preferred form of large-scale capacity in the WoSP, with the highest demand scenario expected to see more than 3000 MW of new wind capacity added over the next 20 years. In particular, the WoSP modelling identifies an opportunity for energy storage facilities such as batteries to enter the market (across all scenarios), mainly to provide certain energy services such as frequency control.

- **Financing for Battery Developments:** Traditional project finance sourced from the commercial bank market has provided a source of financing for a number of battery developments. In this context, committed offtake arrangements with state government (or relevant state government agencies) or other credit-worthy off-takers is a key factor as is certainty of transmission connections to the grid, reliable technology and availability of funding from ARENA and CEFC to bridge any funding gap.
 - For example, Vena Energy's Wandoan South Battery Energy Storage System in QLD reached financial close in December 2020 solely utilizing debt sourced from the commercial bank market of key importance was the fact that the project had secured a 15 years offtake agreement with AGL and adopted a traditional procurement and delivery model with a fully wrapped EPC contract.

- **The QLD government** is investing A\$145 million to establish three **Queensland Renewable Energy Zones (QREZ)** across the state to more renewable projects, attracting new industries, and supporting the achievement of Qld's targets for 50% renewable energy by 2030, and net zero emissions by 2050. It is an auction model run by the state-owned renewable company CleanCo.
- VIC government's developing six renewable energy zones. Part of a A\$1.6bn clean energy commitment, which will be used to buttress and make best use of the solar and wind-farms built to meet a state renewable energy target.
- The NSW government laid out plans to deliver Renewable Energy Zones, more energy storage including pumped hydro, and measures to improve certainty for investors. As part of the plan, the government to introduce Electricity Infrastructure Investment Safeguards, a framework for offering long-term agreements to projects dependent on their type which will be awarded through a competitive reverse auction process.

"Network overload from renewables will only get worse unless there is a co-ordinated response from regulators, state governments, the federal government, network owners and household energy suppliers"

Renewable Integration Study, 2020





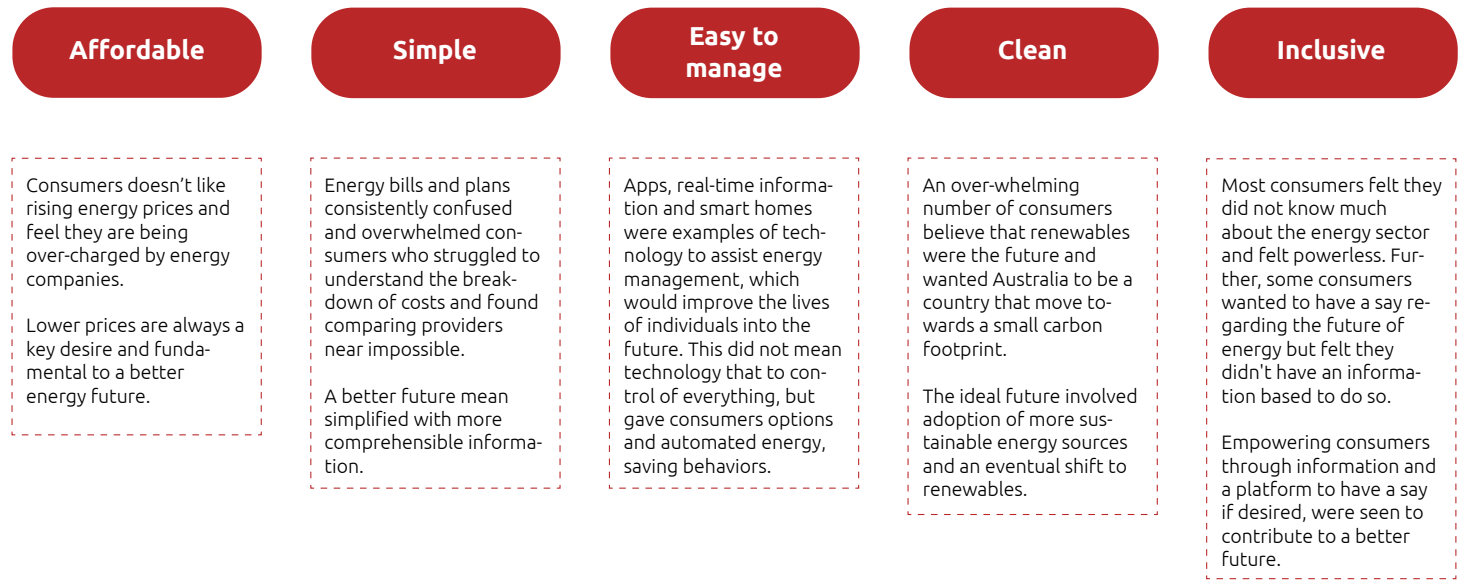
Affordability is the key reason customers change Energy providers in Australia. For relevancy in an increasingly competitively energy market, Australian retailers need to drive simplicity and ease of management through engaging service delivery and customer interactions.

Australian Competition & Consumer Commission (ACCC) conducted research on consumer preferences and expectations through the Energy Consumer Sentiment Survey (ECSS) in August 2020. The research revealed that the Australian energy consumers are least satisfied in the area of value for money and hence they expect the retail energy market to prioritize the affordability of the consumers the most. The report highlighted that consumers preferences have shifted and now geared towards contributing to the clean and inclusive development of the energy system in general.

These survey insights apply not only the customer preferences towards their retail providers, but also towards their transmission and distribution providers. For all participants across the energy value chain in Australia, understanding customer preferences and being armed with

the right level of insight to enable the appropriate response is the most critical focus that utilities organisation need to have strategically.

Consumer vision and expectation for the future retail energy market



Source: ACCC
Link: <https://ecss.energyconsumersaustralia.com.au/sentiment-survey-june-2021/>

FIGURE 8



Reflecting competition and the rate of customer churn, Australian retailers are responding by focusing digitisation efforts on the transformation of customer experience and customer journeys

Some examples of customer experience related initiatives of Australian largest retail utilities: AGL, Origin Energy and EnergyAustralia:

AGL transformed its digital customer experience with Khoros.

- AGL was conducting in-house social media support on Twitter and Facebook until the expansion of their social media team and audience necessitated collaboration with Khoros to build an intelligent, contextual FAQ integration on their website leveraging the Khoros REST API which allowed customers to easily find answers to commonly asked questions promptly.
- AGL customers now have access to content and support in a way that helps them build trust with the brand and feel empowered as consumers.
- AGL is also leveraging Khoros Marketing and Care to respond to customers on social platforms in real-time.

Origin Energy powered self-service expansion with Amazon connect.

- Under Retail 2020 transformation, Origin Energy deployed Amazon Connect, a cloud-based contact center platform that provides smart interactive voice response (IVR) capabilities for the company.
- Previously, customers had to call up, go through messaging with an agent and talk about the plan that they're going on. But now the Amazon Connect solution is allowing its 4 million-strong customer base to get the benefit of self-service options.
- Amazon Connect is helping to reduce call transfers, speed up resolution times, free up agents to handle higher-value call types, and introduce a greater degree of self-service to many types of interactions.

EnergyAustralia empowered customers to choose multiple services in a single platform.

- EnergyAustralia in partnership with Acurus, a Melbourne based ICT multi-product enablement company, has launched an innovative product, Stack On, that allows eligible customers to save time and money by bundling a range of utility, data and insurance services and manage them all in one place.
- The goal of the product is to make customers confident by providing consumers the opportunity to choose services provided by some of Australia's biggest brands

- EnergyAustralia, Optus and Open Insurance on a single platform.

- The solution is currently offering limited access as it is going through initial trials through EnergyAustralia's own innovation trailing platform. The platform uses customer insights to mature the solution before making it widely available.

Learnings from other industries for utilities companies.

Digital customers have new expectations:

- Traditional utility business models do not prioritize high levels of customer interaction. Slower adoption of digital tools for self-service and attention to customer experience has undermined the trust needed to build strong customer empathy and satisfaction.
- Through digital technologies and tools, utilities can now design new experiences as they roll out new products and services to build goodwill, similarly to the experience of AGL, Origin Energy, and EnergyAustralia.

Learnings from Telecom sector:

- One industry that generates considerable data about their customers' experiences is telecommunications. Faced with an aggressive marketplace, telecoms operators have had to adapt and innovate to defend their market position and secure new revenue streams.
- For utilities, one of the game changers in accessing customer insight, and knowledge about how their customers operate is smart meters. Deployment of smart meters will have a critical role in driving utilities to create the capability to create customer insights at scale and building services that align with their customers' preferences.

Utility and High-tech:

- There has been a transition from standalone, licensed software to digitally connected software-as-a-service (SaaS) across the IT industry. The utilities industry is also going through a similar transition from one-way power delivery to digitally connected two-way asynchronous interactions.
- Utility companies will have to rethink their business models in the context of this transition to subscription-based services, to create new recurring revenue opportunities. Since Utilities have the advantage of being subscription-like, they can learn how to drive and grow value to earn monthly fees and renewals.





Australian utilities are focusing on innovation to better capture the market, cut costs and drive efficiency

Regardless of where utility companies sit in the energy value chain, the customer is the focus of digital reinvention.

- The Australian energy sector is on the cusp of change, and for all utilities, at the core of that change must be the customer. This is regardless of what part of the utility value chain an organisation is operating in - a retailer, a transmission and distribution company or an operator of renewables.
- For all utilities, and amongst infrastructure operators particularly, cost cutting, and efficiency is a high priority, but efficiency-based change should be considered within the context of the ability of the business to deliver the services customers require and seek on the most efficient and effective basis. Operations-based innovation and transformation must be centred on how the physical assets managed by utilities enable innovation, new services and new capabilities aligned with the requirements that customers have. Investing in the intelligence of the grid and integrating physical operations with customer processes is an enormously important source of value creation for utilities and the customers they serve. For many utilities in Australia, these ideas mean a fundamental reassessment of business models, operating models and what the digital priorities are going forward.

- Most of the energy companies in Australia aren't doing justice to their potential when it comes to enabling their transformations with digital capabilities. There is a requirement to redefine business models digitally to drive the genuine productivity gains that can help create customer, community and shareholder value.

There are some great examples of Australian retailers who have brought innovation to the sector.

- Origin Energy and AGL have partnered with UK-based disrupters Octopus Energy and OVO Energy to bring better customer experiences and capture market share. Both OVO's and Octopus' solutions use a hybrid approach to scale, enable direct business-to-consumer models in some markets and business-to-business models in others, to provide an end-to-end superior customer and employee experience.
- Origin Energy adopted the leading operating model and technology platform offered by Octopus to deliver significant benefits for their customers, employees and shareholders.
- AGL partnered with OVO Energy in a joint venture that allowed AGL to license their intelligent energy platform to offer customers real-time information and provide control over their energy use, using smart meters, home solar and batteries, and electric vehicle to grid (V2G) charging technologies.
- Simply Energy partnered with Rheem Australia and SA Power Networks to launch an Active Hot Water

Control project aimed at increasing the uptake of renewable energy and improving Southern Australia energy system.

- The project hopes to bring new and flexible options for grid management by testing ways to use home heating systems for energy storage and to help maximize the use of renewable energy and improve the stability of the local electricity network. The project was launched under Rheem Australia's renewables brand named "Solahart".
- The project has the potential to deliver both cost savings and a route to further grid stability in SA where rooftop solar power has reached record levels and was awarded funding from the Australian Renewable Energy Agency (ARENA) as well as the SA government.
- EnergyAustralia, in partnership with a Brisbane-based startup Redback Technologies, launched the Redback Smart Hybrid System that combines a solar inverter, battery enclosure, and cloud-based energy management software into a unit that can be mounted inside or outside the home. The solution offers an "all-in-one" solar, battery, and software solution aimed at providing consumers with greater visibility over their energy consumption.
- Powershop partnered with UPowr to offer customers an easy, stress-free and innovative way to get solar. UPowr is a digital solution that uses advanced 3D modelling considering roof orientation, tilt and

shading to design quotes and systems specifically for a particular roof. UPowr is able to provide estimates on how much the system will generate and what the customer is likely to save based on past energy usage.

Connecting with start-ups to nurture utilities innovation.

Free Electrons is a global accelerator program seeking the next generation of ideas in energy innovation and aims to connect the people with these ideas to major utilities currently serving more than 70 million customers in 40 countries. Leading Australian utilities AusNet Services and Origin Energy are the founding members of the consortium and share a commitment to innovate and work collaboratively with energy entrepreneurs to transform the energy market by leveraging cutting edge solutions.





Surging renewables uptake and the increasing importance of energy, how it is sourced and what the relationship is between customers and energy suppliers, will drive innovation in the Australian energy sector

Penetration of smart meters in Australia is continuing, but outside of VIC, the penetration of smart meters is still low.

- VIC was the first state to progress metering reforms. Its electricity distribution businesses rolled out smart meters from 2009 to 2014. As per AER's state of the energy market 2021 report, around 98% of small consumers in Victoria have a smart meters.
- In February 2021, NSW had the highest penetration of smart or interval meters, at around 25% of residential and small business customers. Smart-Meter installation levels in other states ranged from 15% of customers in QLD to 23% of customers in the ACT.

The relationship between energy and consumers is changing.

- Sustainability, climate change and net-zero targets have shifted the importance of energy as a product for consumers. It is no longer simply a necessary service:

Where the energy comes from, how it is generated, how it is consumed is now increasingly important.

- Associated with the above, take up on renewables is creating new roles for customers in the market. Renewables at scale not only distributes energy resources but also disrupts the basis of service delivery and changes the nature of relationships between energy providers, infrastructure managers and customers.
- As an example of the nature of changing relationships and in order to reach out more directly to its end customers, T&D operator Ausgrid has trialed what it says is the first of many community batteries in the Sydney suburb of Beacon Hill. Through the battery trial, Ausgrid is seeking to engage its customers who have solar panels already installed or who are planning an installation. Through the battery, Ausgrid will provide storage on a shared basis so that individual customers don't have to make individual storage investments. Ausgrid intent to implement more batteries of this type in areas of high solar uptake across its network.

Multiple utility firms are innovating new services to customers.

This environment for innovation drives the need for new business models to access new revenue streams. Below are selected recent examples:

- **AGL has launched smart home kits:** In September 2020, AGL announced a new range of smart home kits to assist customers to reduce their energy bills through automated energy efficiency improvements. The kits, which contain different smart home devices, consist of voice-activated lights, energy monitoring plugs, smart controllers for split air conditioning systems and smart speakers.
- **Mojo Power Retail Marketplace "Elemental" provided by WePower:** The new Mojo Marketplace serve Mojo Power's small business and corporate customers and is the first full-featured version of WePower's "Elemental" to be deployed in the Australian market.
 - WePower's Elemental Marketplace has been designed to enable electricity retailers to offer renewables-linked retail electricity contracts to business and corporate customers.
 - Mojo's customers can purchase locally-sourced renewable energy as a standard retail electricity contract – a novelty in the Australian retail electricity market.

- ***Social Energy launched in Australia with an aim to reduce electricity bills to as little as A\$0 for customers who buy a solar and battery system:***
 - Smart energy retailer Social Energy entered in Australia market to offer customers its service that reduce electricity bills to zero, with a completely green energy package and exclusive Duracell home solar battery system.
 - The green energy retailer uses its artificial intelligence platform and virtual power plant technology to optimize solar-connected battery storage.
 - Social Energy is working with Duracell, a consumer battery company, to provide access to consumers with its' lithium-ion Duracell Energy Bank 2, scalable to different sizes to meet indoor and outdoor needs of every home.
 - Innovative energy retail start-up Amber Electric provides its customers direct access to wholesale electricity prices: Customers pay a fixed monthly subscription (\$15 a month plus tax and insurance) plus a variable usage charge. Customers can adjust their consumption in response to wholesale electricity price spikes and the share of renewables supplying the grid. Total cost to the customer is limited by Amber, for example to the Victorian Default Offer (VDO) in VIC.





How is the Australian Energy Market Expected to Change?

In comparison with some other energy markets around the world, particularly Europe, the Australian energy sector has been slow to innovate, transform and change. This is the case even in Australian states where competitive retail markets are operating. As the Australian market faces this period of considerable change, there will be an increasing requirement for providers to understand and respond to the impact these changes have on their operations.

Changes the Australian power market will experience:

In its State of Energy report 2021, AER set out several key areas where change is expected in the market:

- Wholesale prices are forecast to fall which will drive electricity retail prices lower.
- The market share held by Tier 1 retailers including AGL, EnergyAustralia and Origin and primary regional retailers including Ergon, Aurora and ActewAG continued to decline this quarter. More customers are moving to Tier 2 retailers.
- The pandemic continued to have an impact on energy debt amongst energy consumers.
 - The number of residential gas and electricity customers in debt in Q3 2020-21 was 178,167 compared to 161,117 for Q3 2019-20.

- Average residential debt for gas and electricity at the end of Q3 2020-21 was A\$1,021, which increased from A\$826 in Q3 2019-20.
- In coming years, customers are anticipated to increasingly store surplus energy from solar PV systems in batteries and draw on it when needed. In this way, customers will reduce peak demand for electricity from the grid. This will allow distributed energy resource (DER) owners to better control their electricity use and power bills, while taking initiative on environmental concerns. If DER is properly integrated with the power system, they could also help manage demand peaks and security issues in the grid.
- Batteries will play an increasing role for energy consumers in managing their power requirement, and consumers could be paid by energy suppliers to reduce their energy use or inject stored electricity when the grid is under stress. Technological advances that make battery storage more economical will accelerate this shift.
- The pace of electric vehicle (EV) uptake is anticipated to have a significant impact on electricity demand and supply. Charging EV batteries to likely generate significant demand for electricity from the grid and it may also provide electricity back to the grid at times of high demand.

Implications for retailers:

- Consumers expect flexible service offerings that can combine their own demand and generation patterns with local community offerings while at the same time provide the same level of safety and reliability of supply of the traditional offerings. According to Energy Consumers Australia, most Australians still buy electricity on a monthly or quarterly based billing cycle which is only distantly connected to everyday decisions. Consumers are interested in new and different approaches to how they access electricity which also includes consumers who are in vulnerable circumstances and struggling to pay their bills.
- In the future, the electricity system is planned to be 100% renewable and storage based, which will prompt consumers to be more flexible in their use of electricity.
- While it is evident from the examples referenced, there is progress in the Tier 1 and Tier 2 retail space around new business models. Retailers need to continue to develop and implement new digital based business models to support the strength and resilience of the overall system while making it easier for consumers to benefit from the choices. If prominent retailers fail to transition their service capability in line with consumers requirements, the opportunity for smaller players and new entrants like Amber Electric and Powershop, who are more future focussed, will continue to grow.

Implications for distribution network service providers:

- Distribution businesses need to work with AEMO and market participants to develop an integrated model for the energy system of the future and the future role of distributors i.e., the role of distribution system operators.
- There is an opportunity to do more to continue the journey of driving customer centric business models and culture.
- Grid modernization for flexible renewables integration and grid stabilisation needs to continue to be a focus.
- Continuing to embrace digital to reduce the cost of grid operations is a must.

"A small but growing fleet of electric vehicles on our roads also continues to prompt policy debate about network charging"

AER State Of the Energy Market 2021

"Customers needs to be the single biggest driver for regulated monopolies, which have historically had a different lens. To be a sustainable business, we need to be customer focused."

Jason Clark, Executive General Manager, PLUS ES





Key Takeaways: Australian energy retailers operate largely traditional business models. Accelerating renewables growth, changing customer expectations and new technologies puts increasing pressure on their business models and service offerings

Overall energy demand decreased in 2020, but energy affordability remains a challenge especially for low-income households.

- Falling international fuel prices and low-cost renewable generation flowed through to households resulting in lower cost energy.
- Power is still a significant household expense item, particularly for low-income households which still pay more than double energy cost as a proportion of income.

While wholesale prices continue to drop, the average household bill rose due to increased residential consumption.

- Between 2017-2020, median market prices dropped between 4-19%, depending on state. However, despite

the fall in market prices, in 2020, residential customers experienced a 7% increase in their median quarterly bill from A\$310 to 332. This was a consequence of the Covid-19 pandemic causing an increase in power utilization for residential customers at home. However, in contrast, business customers who were disrupted by the pandemic, particularly in the small business segment, heavily impacted power utilization.

- The AER introduced a Statement of Expectations to provide extra protection and support to customers and the market through the Covid-19 pandemic.

Although customers experienced significantly more time off supply primarily due to bushfire and weather events, the performance indices highlight stable/improved reliability performance of the grid operators.

- The average customer experienced a significant increase in total minutes off supply in 2020.
- Distribution companies beat their interruption frequency targets (SAIFI) by 17% and performed 3% better against their interruption duration targets (SAIDI).

Australia's energy retailers continue to experience one of the highest customer churn rates in the world, though Covid-19 has significantly reduced churn.

- Australia's average churn rate in 2020 was 23.9%. While this is still a record high on a global level, it is a significant drop from 19.4% in 2019, driven by Covid-19.
- In a very crowded market, retail companies are racing to differentiate themselves, not just in price, but customer service, transparency and reliability to increase "stickiness".

Renewable growth will have enormous disruptive impact on all parts of the Australian energy ecosystem over the coming years.

- 2020 saw a record number of negative wholesale electricity prices in the NEM.
- Renewables are driving significant cost reductions for end consumers as well.
- Inverter-based generators such as wind, solar and PV are still causing stress on the traditional grid, although new technology solutions to support frequency control and system strength are emerging.
- While state and federal government continue to support and subsidise renewable investments,

initiatives are emerging that are solely funded by market financing.

- Renewable energy combined with investments in the grid to create more autonomous and intelligent grid response, will create the environment for customer solution innovation at an individual, household, community and regional level.

Operating in high churn markets has led Australian retail utilities to prioritise digital investments around customer experience and journey transformation.

- Energy customers have developed new expectations from their experiences in other industries. Changing attitudes to renewable energy, the customer's relationship with their energy provider and preferences relating to the sources of energy for example will continue to drive changes in customer preferences that retail utilities will need to respond to.
- Power utilities have an opportunity to learn from the experience of other industries such as telecommunications and banking, who have similarly managed negative customer perception in highly competitive retail marketplaces.



About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided everyday by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of 290,000 team members in nearly 50 countries. With its strong 50 year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering and platforms. The Group reported in 2020 global revenues of €16 billion.

Visit us at

www.capgemini.com/WEMO