Consumer Services in Electricity Markets: A Scoping Study

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This report was prepared for Energy Consumers Australia. All results and any errors are the responsibility of the authors and do not represent the opinion of The Brattle Group or its clients.

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Foreword

The energy affordability crisis households and small businesses are experiencing means accelerating the development and diffusion of effective energy management services and technologies is an urgent policy, regulatory and market priority.

The problem is, to quote writer William Gibson, “The future is already here — it's just not very evenly distributed”.

Innovative new technologies for generating, storing, and managing electricity are emerging that will change when we use electricity and consequently the entire electricity system. Solar panels allow homes and small businesses to generate their own power, while home batteries or electric vehicles with vehicle to grid technologies allow us to store it. Smarter, more efficient appliances are emerging that can give us better information about how and when they are drawing power, while allowing consumers or other third parties a host of pre-programmed and dynamic smart controls. Taken together these new technologies hold out the promise of individualised services, helping households and businesses to better manage their energy use and reduce their bills.

However the energy management services to connect and package these new technologies in a way that works for consumers is yet to emerge at scale and it remains very difficult for most households and small businesses to track and understand their energy use, let alone take steps to manage it.

To understand the factors holding back the delivery of innovative customer services and technologies, Energy Consumers Australia commissioned The Brattle Group to do a scoping study to review similar markets where those services are already in place, and to talk to a small group of companies offering innovative energy services, who are currently active in, or had sought to enter the Australian market.

This research provides new insights into the scope of innovative energy services and technologies available to us, and the barriers that market participants perceive towards realizing those services:

- There is inertia in the system, both within incumbent businesses, and at a framework level, that acts as a hard barrier and a cultural break on innovation.
- It is not clear that anyone in the supply chain has the incentive to deliver an energy management service that optimises the outcome for consumers.
- To knit all the devices and technologies together that would deliver the holistic outcome for consumers relies on a level of interoperability (standards) that does not exist.

Most importantly, while these barriers are certainly significant, they are not insurmountable. The paper suggests a number of potential remedies, including:

- An innovation ‘sandbox’ that creates a space for experimentation in a regulatory environment that can be complex and prescriptive.
- Explore mandated national targets for energy savings and management.
- Accelerate the development of consistent standards for energy management devices to unlock integrated solutions for customers.

Energy Consumers Australia will use the findings in its dialogue with government, regulators and industry on retail market reform.

This Brattle study adds to the evidence base established within Energy Consumers Australia’s Power Shift project, funded by a Commonwealth Government grant, which is improving our understanding of what really works in supporting consumers with vulnerabilities to manage their energy bills, and identifying opportunities for market solutions. Energy Consumers Australia welcomes further engagement and feedback on this study and the Power Shift agenda, to build on the evidence base and equip decision-makers to better design, target and develop information and tools for consumers.

Rosemary Sinclair AM
Chief Executive Officer

I. Introduction

Energy Consumers Australia (ECA) is interested in understanding the barriers to the creation of an energy services market for mass market customers in Australia. Such services would include any products that allow consumers to better understand and/or manage their electricity usage and energy costs. These services could be provided by electric retailers or third party vendors.

To assist the ECA in this task, we undertook a scoping study to understand what services are provided in other markets and what industry participants see as barriers to innovative services in Australia. To accomplish this, we did a scan of innovative retail offerings available in the competitive markets of Texas and the United Kingdom, which are are often held up as two of the most competitive retail electricity markets in the world.[1] This was followed by non-attributable interviews with innovative electric service providers that are operating in, or have evaluated entering, the Australian market. Looking at alternative service offerings in other jurisdictions helped to shine a light on not just where possible gaps in Australian service offerings exist, but also in those areas where the Australian market is providing valuable services and choices to customers. Our interviews with service providers also provided insights as a series of common themes emerged, although it should be noted that these barriers were unanimously seen as speed bumps, not roadblocks.[2] We use these themes to lay out a focused agenda for future research.

II. Retail Services Overview

In this section we discuss examples of innovative retail services that are offered in Texas, the UK and Australia. This list is by no means exhaustive or representative. There are many retailers in each jurisdiction with many offers per retailer. For example, in Texas there were

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1 Texas has many retailers and many offers available for residential customers in the market. Although no data is available on industry concentrations, the market share of the retailers that were spun from the original monopoly businesses is low. The UK is market is characterised by relatively low market shares and high switching rates. For more details see:

- Association of Electric Companies of Texas, "The Retail Electric Market in Ercot", 2017
- Public Utilities Commission of Texas, "Summary of Performance Measure Data (Non-Confidential Version)", December 2017
- Ofgem, "State of the Energy Market Report, 2017 Report", October 2017

2 The choice of companies was not random and results may be biased because they only consist of companies that have been successful in the electricity industry. Firms that had failed may have a different perspective on barriers. However, this concern is mitigated somewhat by that fact that two out of the five firms interviewed, although successful in other markets, had not yet found success in the Australian market and had scaled back or withdrawn local operations. Despite this, their views on roadblocks vs. barriers were similar to the other interviewees.

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more than 50 competitive retailers, with more than 360 offers available as of 2016 (as measured using the number of residential offers in the Oncor area).[3] These offers will change over time.

For the most part, we are not able to observe anything about the offers, apart from their terms. Retailers are not obliged to report customer uptake for any offer and so we do not know how popular the offers are, or the demographics of customers who have accepted them. We can infer that an offer is likely popular if several retailers offer it, and thus try to highlight this when observed.

A. Innovation in Australia

While the Australian market may lag behind other retail markets in some service aspects, it would not be fair to characterise it as lacking in innovation. Australian customers have been able to purchase certified renewable electricity through the government run GreenPower program since 1997. In the 2016 settlement period, GreenPower Products were offered by 30 retailers, with over 245,000 residential customers opting in across Australia.[4] Australian customers can purchase solar system packages through their retailers, with several retailers, including AGL, Energy Australia, and Origin, offering deals. Retailers are also starting to offer storage solutions.[5]

Retailers are offering customers more flexibility in how and when they pay their bills. Powershop offers customers the flexibility to pre or post pay for electricity. Customers can pay as frequently as desired through an app and get discounts for paying on advance.[6] Similarly Aurora Energy and AGL have both started offering a prepaid service using smart meters.[7,8] AGL is also developing novel bill presentment ideas, by creating custom algorithms for disaggregating device usage using smart meter data.[9]

Several retailers also piloted demand response programs through ARENA's trial in the summer on 2017/18. In the pilots, AGL, Energy Australia, Flow Power and Powershop are exploring a

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3 Association of Electric Companies of Texas, "The Retail Electric Market in Ercot", 2017, accessed 2 May 2018.

4 Clean Environment Pty Ltd, "National GreenPower Accreditation Program", 16 July 2017.

5 Origin Energy, "Solar Battery Solutions", accessed 18 May 2018.

6 Power Shop, "Questions Answered", accessed 18 May 2018.

7 Russell, G., Aurora Energy, "Customer Access to Real Time Information", February 2018.

8 AGL, "A new way to manage your electricity with AGL Prepaid", accessed 18 May 2018.

9 AGL, "Energy Insights", accessed 18 May 2018.

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variety of demand response products involving: HVAC load shifting, peak time rebates, direct load control, and coordination of virtual power plants.[10]

B. INNOVATION ELSEWHERE

1. Beyond energy – digital home service platforms

In 2017, three UK competitive retail suppliers announced digital services that connect their customers with companies that perform various household jobs.

British Gas, the UK's leading energy supplier by sales volume,[11] launched Local Heroes, an on-demand service which connects customers with local tradespeople to carry out household jobs.[12] The platform has plans to add more trades, but currently focuses on more than 2,500 local plumbing, heating, electrical, and drainage experts, all of whom have been vetted and approved. All work conducted through the platform also comes with a 12-month guarantee.

First Utility, the UK's largest energy supplier outside of its "Big Six" companies, launched a service to connect customers with local suppliers in the case of emergencies, for instance a broken boiler, as well as more general on-demand household tasks like gardening and cleaning.[13] First Utility also offers a broadband internet service, with a discount for existing customers.[14]

Finally, EDF Energy is trialling Hoppy, a new digital home services platform it hopes to launch in early 2018. Hoppy will connect customers with local trades for a range of household jobs, as well as information about TV packages and energy and broadband deals.[15] EDF Energy already offers a broadband service through a third party provider.

It is not clear whether these platforms will be offered at a discount for existing customers, or whether the retailers are just leveraging their customer data and brand. If the latter, then it may result in reduced energy prices for customers as they become more valuable to the retailers.

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10 Arena Wire, "The eight innovators who are driving the demand response revolution in Australia", 11 October 2017.

11 Ofgem, "Electricity supply market shares by company: Domestic (GB)", April 2018.

12 Centrica, "Centrica announces national roll out of an industry first, 'Local Heroes'", 12 June 2017.

13 First Utility, "First Utility launches Home Services offering on-demand help from top rated tradespeople", 24 April 2017.

14 First Utility, "Products", accessed 18 May 2018.

15 Utility Week, "Energy Retail - EDF Energy eyes home services expansion", 31 October 2017.

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2. Free Energy and Time of Use

A number of retailers offer time of use programs with free electricity during the off-peak. British Gas offers HomeEnergy FreeTime tariffs with free electricity from 9 am to 5 pm on either Saturday or Sunday.[16] In Texas, Direct Energy, Reliant Energy and Champion Energy all offer free weekends.[17,18,12]

Meanwhile, TXU Energy offers a Free Nights & Solar Days plan with free electricity all night from 9 PM to 6 AM, and solar electricity all day from 6 AM to 9 PM. Under this plan, TXU Energy purchases solar power and renewable energy credits, allowing customers to offset their carbon footprint without installing their own solar panels, although the free night time electricity is not 100% renewable.

In January 2017, Green Energy launched the UK's first more conventional residential time-of-use tariff, with three different pricing periods.[19]

3. Free Energy Efficiency Devices

In the UK, EDF Energy's Connect+Control2 tariff comes with a free 2nd generation Amazon Echo and HeatSmart thermostat, which customers can use to control the heat with their voice.[20] First Utility's First Control tariff likewise offers a free Nest thermostat,[21] whereas npower instead offers its customers discounts on Nest products.[22]

In Texas, Champion Energy offers a two year price plan with a $50 smart thermostat rebate and $50 in free LEDs,[23] compared to Green Mountain Energy's offer of a free Nest thermostat with its 100% renewable Pollution Free Efficient plan.[24] Reliant Energy similarly offers a free Nest thermostat, which customers can use to enrol in the Reliant Degrees of Difference with

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16 British Gas, "Tariffs A-Z" , accessed 18 May 2018.

17 Direct Energy, "Free Weekend Electricity" , accessed 18 May 2018.

18 Reliant, "Reliant Truly Free Weekends plan", accessed 18 May 2018.

19 The Guardian, "Green Energy UK offers first electricity tariff based on time of day", 4 January 2017.

20 EDF Energy, "Welcome to Connect + Control2", accessed 18 May 2018.

21 First Utility, "First Fixed June 2020", accessed 18 May 2018.

22 Nest, "npower", accessed 18 May 2018.

23 Champion Energy Services, "Offers for you", accessed 18 May 2018.

24 Green Mountain Energy, "Pollution free efficient with nest", accessed 18 May 2018.

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Nest program for a $5 monthly credit from May to October.[25] Under the program, customers' Nest thermostat will automatically adjust itself during periods of high electricity demand, but customers can override the temperature at any time. [26]

4. Demand Response and Rebates

Several demand response programs are available in Texas. Direct Energy customers who enrol in the Reduce Your Use Rewards program can receive a 10% bill credit by reducing their energy use by 10% during specified times throughout the summer.[27]

As discussed above, Reliant Energy has the Reliant Degrees of Difference with Nest program for a $5 monthly credit from May to October.[28] Under the program, customers' Nest thermostat will automatically adjust itself during periods of high electricity demand, but customers can override the temperature at any time. [29]

5. Prepayment

As an alternative to traditional electricity plans, many retail suppliers also offer prepaid plans with no deposit, credit check, or long-term contract.

In Texas, First Choice Power offers a plan under which customers pay month-to-month for the electricity they intend to use. Customers can elect between the Power-To-Go Variable plan, under which their rate will fluctuate with the energy market, and the Power-To-Go Free Weekends plan, which includes free electricity on Saturday and Sunday.[30] Champion Energy offers similar prepaid offers, including both a Free Weekends plan and a Free Nights plan, all of which come with a $10 welcome bonus and another $20 bonus after 100 days.[31]

Across all these prepaid plans, customers only require a smart meter and the ability to receive text or email notifications that help them monitor their usage. In the UK, OVO Energy's Pay As You Go plans specifically come with a free smart meter installation and the option of an app or In-Home Display unit.[32]

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25 Nest, "Reliant", accessed 18 May 2018.

26 Nest, "Learn more about Rush Hour Rewards", accessed 12 December 2017.

27 Direct Energy, "Reduce Your Use – Rewards", accessed 12 December 2017.

28 Nest, "Reliant", accessed 18 May 2018.

29 Nest, "Learn more about Rush Hour Rewards", accessed 12 December 2017.

30 First Choice Power, "Sign up for Prepaid Electricity", December 12, 2017.

31 Hello Energy, "Order Now!", accessed 18 May 2018..

32 OVO Energy, "OVO tariffs explained", accessed 12 December 2017.

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6. Fixed Prices and Insurance Products

Reliant Energy in Texas offers a Reliant Predictable 12 plan, which protects customers from seasonal spikes by keeping electricity costs constant for 12 months.[33]

EDF Energy in the UK offers a fixed tariff that also includes insurance cover for water and space heating equipment.[34] Their Connect+Control tariff which comes with a free Amazon Echo and controllable thermostat (discussed above) also has a fixed tariff.[35]

7. Enhanced Customer Feedback

Eneco in the Netherlands leases the Toon to customers (an Eneco branded version of the Quby Smart Thermostat), which offers wireless thermostat control in conjunction with standard In Home Display (IHD) features. Using graphics and diagrams, it provides insight into the consumer's current energy consumption relative to its use in previous days, weeks, and months.[36] Since its launch in 2012, it has introduced new user-friendly features such as the ability to compare one's energy usage against other users' or friends', to monitor how much energy is consumed via the colored LED-ring, to set alerts when usage is higher than expected,[37] and to wirelessly control third party equipment such as Wi-Fi enabled lighting.[38] Recent analysis of annual bills shows that energy consumption of Toon users was reduced by some 10 percent.[39]

ReliantEnergy offered 10,000 free IHDs in 2012 to early adopters,[40] but it isn't clear if this offer continued. They do offer free home energy snapshots to customers that let measure a customer's current consumption relative to the past and to other homes.[41]

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33 Reliant, "Give yourself the electricity plan that makes budgeting easy", accessed 18 May 2018.

34 EDF Energy, "Blue+Heating Protect", accessed 18 May 2018.

35 EDF Energy, "Welcome to Connect+Control2", accessed 18 May 2018.

36 Spark, "Toon®: Eneco's smart thermostat", 8 March 2012, accessed 31 August 2016.

37 Eneco, "Today is the future", accessed 31 August 2016.

38 Eneco Group, "100,000 Toon smart thermostat users by end of this year", September 2014, accessed 31 August 2016.

39 Eneco Group, "100,000 Toon smart thermostat users by end of this year", September 2014, accessed 31 August 2016.

40 Business Wire, "Reliant Providing 10,000 Free Home Energy Monitors to Early-adopter Customers", 9 January 2012.

41 Reliant, "Home Energy Checkup", accessed 18 May 2018.

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In the current UK retailer-led smart meter rollout, all customers accepting a smart meter must also be offered a free IHD. The IHD is a physical device which must present near-real time energy consumption information to customers.

Alert programs can have different purposes for notifying the customer such as monetary goals, kWh goals, and possible tier changes (if a customer is likely to move into higher pricing tiers by the end of a billing cycle). Alert programs that are being offered typically send alerts via SMS text messaging or email, and customers can choose which methods they prefer or both. Alert programs need near real-time information from smart meters to alert customers of projected usage in a timely fashion. Most modern prepay services, that use smart meters, do some variation of SMS/email alerts. Some postpaid services also offer alert programs to help customers track their energy usage and avoid unwelcome surprises on their electricity bill. For instance, TXU Energy allows all of its customers with smart meters to sign up for emergency management alerts, which send them weekly usage updates, notices for suddenly changes in consumption, and warnings when they near their chosen monthly budget. [42] ChampionEnergy likewise sends its customers weekly "Smart Track" home energy consumption reports, with detailed usage information and monthly bill projections.[43]

III. Potential Barriers to Innovative Retail Services

A. Methodology

We reached out to a number of innovative energy service firms that were active in the Australian market, or that we knew had contemplated market entry before. We conducted in-depth interviews with five service providers, three from Australia and two from abroad. We caution that for a number of reasons, the interview results should be taken as indicative and not definitive. First, the scope of the survey was not representative of the market and the sample of firms surveyed was relatively small. Second, the pool of firms interviewed, who are all still active in the market, may have different perspectives than those of firms who had already exited the market. Third, to enable participants to speak freely, we agreed beforehand that interviews would be non-attributable. This potentially introduces another form of bias as the authors are left to organize and interpret the subject matter.

We do think that the "survivorship" bias is likely somewhat mitigated since the two international firms interviewed had not yet found success in the Australian market. One of the firms had conducted a pilot in Australia and then had subsequently withdrawn from the market, while the other had actively considered entry and decided it was best at that time to focus their attention elsewhere. We have tried to minimize bias in our reporting of interviews

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42 TXU Energy, "Alerts and Tools", accessed 18 May 2018.

43 Champion Energy Services, "What is Smart Track?", accessed 18 May 2018.

by supporting fact with selected quotes. To make the process more transparent we also discuss the interview subjects below.

GreenSync is an Australian energy and software company founded on the principals of enabling customer participation. Greensync has created a decentralized energy exchange named deX that functions as a market place for distributed energy resources. deX takes into account the physical constraints in the electricity system, and thus prices in the market place will reflect local conditions. Greensync has a number of partner organisations for deX across the industry, with retailers, networks, equipment manufacturers and more involved. In its first major implementation of deX, Greensync has partnered with the distribution company, United Energy, and the Mornington Peninsula Shire, to create The Community Grid Project (TCGP). TCGP aims to help United Energy avoid or defer distribution upgrades, while facilitating the growth of distributed energy resources on the Mornington Peninsula. The project is supported by the Victorian Government's New Energy Jobs Fund. Apart from Australia, Greensync is currently active in New Zealand and Singapore.

Power Ledger is an Australian company that has created a block-chain based peer-to-peer energy trading platform. The platform aims to allow businesses and consumers to trade energy with each other, in contexts such as strata and community-titled developments, microgrids, and neighborhoods. Power Ledger previously partnered with energy retailer Origin for a three month technical trial, exploring the cost and benefits of peer-to-peer energy trading across a regulated network. Further trials were held in White Gum Valley, where solar generation and energy storage systems between neighbours were combined to reduce usage from the grid. Power Ledger is also currently active in Thailand and New Zealand.

Reposit Power provides a combined hardware and software solution that optimizes home electricity production, storage and consumption. Reposit's product forecasts customer usage, predicts solar panel generation, takes into account variation in energy prices due to time of use tariffs, and allows customers to earn more than the typical solar feed in tariff by receiving credits that are linked to wholesale price peaks and FCAS events. In early development, Reposit Power received an ARENA grant of $446k that allowed the system to be installed and tested for a larger rollout.

Simple Energy is an American demand side management service provider. They use behavioural science to better manage customer communication and facilitate energy conservation and bill savings. Simple Energy also offers a marketplace service which serves as a centralized location for customers to access energy saving products and services from their utility. Customers are offered energy efficient equipment at prices that are already net of any utility rebates, enhancing customer adoption. In the US, Simple's main clients are vertically integrated utilities, who contract with Simple Energy to meet their energy efficiency goals or mandates. However, a number of retailers have also partnered with Simple to assist in enhancing customer satisfaction, thereby increasing customer retention.

Tendril provides a variety of demand side management products, including behavioural conservation through home energy reports and orchestrated direct load control tools. Based in the US, Tendril entered the Australian market in 2011 on the back of a large pilot project with retailer Origin, and subsequently left Australia as no further large projects materialised. Their

strategy is to go to market via retailers, where they can offer wholesale hedging products and enhanced customer retention.

The five chosen firms reflect perspectives from multiple types of energy service offerings: GreenSync and Power Ledger have sights on marketing new disruptive energy trading platforms, Reposit Power focuses on helping consumers optimize residential electricity usage, and Simple Energy and Tendril provide services to retailers that in turn help manage energy use by the end consumer. We recognize that answers from the interviewees are largely shaped by their provided product or service, motivations, and individual experiences. Another sample of firms drawn from a different pool, may well have given very different perspectives.

Interview questions were developed with the help of the ECA and focused on several themes:

1. What was the consumer need that the service provider identified and how did they meet it?
2. What were the barriers they faced in introducing their product to the Australian market? Did these barriers still exist or had others arisen and what reforms would they make to the market to reduce barriers?
3. What was their experience in other markets? Were they more facilitative in helping them meet customer needs?

B. IDENTIFIED BARRIERS

Although the respondent firms all had different marketing structures, value propositions and potential clientele, themes emerged that were common to multiple (but not all) respondents. However, all respondents agreed on two things:

1. The barriers in the industry were not insurmountable. There was a sentiment that although the industry was not facilitative towards change, change was inevitable and was occurring already.
2. The biggest current barrier in the industry was a cultural resistance to change from within. Respondents variously stated that this cultural resistance was evident in both market participants and market bodies. As one respondent put it, the biggest barrier that they faced was, "Forty plus years of career history". Another said there was a pervasive view in the industry that certain things cannot be done, this viewpoint was echoed by several other respondents. Various reasons were postulated for this:

    a. There is a mature framework at the market level and regulators have become far more reactive than proactive.
    b. Even though the leadership at various government institutions and private sector firms may be ready for change, there is an entrenched staff base that is resistant to change and ultimately this is what drives institutional views, rather than the leadership.
    c. Inexperience and discomfort with new policies and technologies.

It was recognized that changing the way of thinking within the industry would pose a massive institutional cultural communication challenge.

Figure 1: Common Barriers to Innovative Retail Services

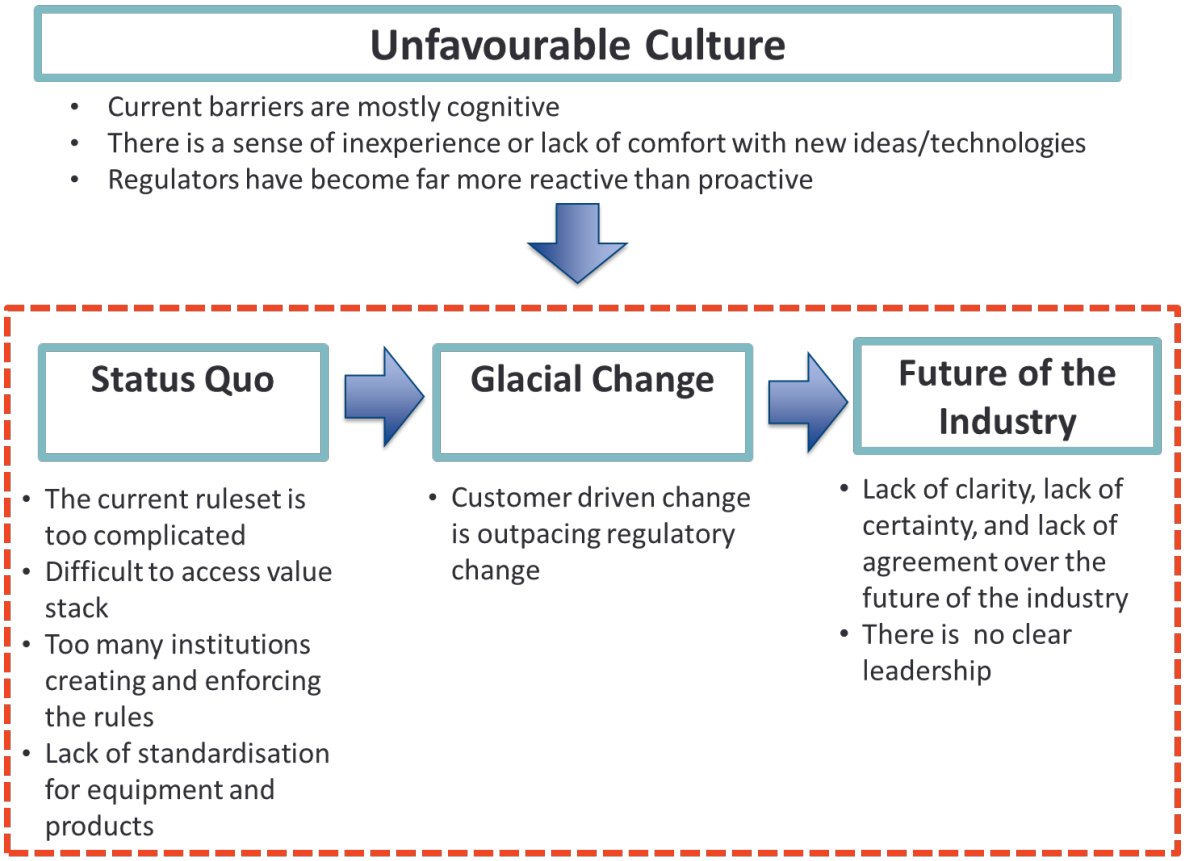

Figure 1 illustrates how an unfavorable culture among regulators, industry bodies, utilities and market incumbents is seen by respondents as permeating through all of the other barriers that impact the development and growth of innovative retail services. It contributes to an overly complex status quo, a pace of change that is glacial, and a future that lacks leadership and vision.

There are several barriers under the current status quo:

The **rules are seen as being too complex** with **too many institutions creating and enforcing the rules**. The market bodies are perceived as being slow moving and risk averse. One respondent said, "Regulators don't innovate, they regulate". There was a concern that the rules are one size fits all, despite huge differentials in size and power between the incumbents and new entrants, and that these rules benefited the market incumbent. New entrants, having actual exposure to market risks, need to innovate to hedge and remain competitive, while incumbents have no such need. Furthermore, the rules are long and complex and difficult for new entrants to understand and capitalize upon. The respondents felt that as a result, many new entrants are too scared to innovate, since they perceive the risk of committing a regulatory infraction to be high. One respondent did mention that in their experience the regulators were approachable and reasonable, and that the risk was perceived rather than real.

There is a split incentive problem between different parts of the industry, making it **difficult to access the full value stack.** For example, while retailers have an incentive to help customers understand and manage their energy bill, they do not have an incentive to help the network manage costs as this would also benefit their competitors. This is potentially exasperated by a perception of competition/antagonism between networks and retailers for things like access to consumer data.[44] Some of the respondents, who were active in other markets, mentioned that there was a clearer value proposition in vertically integrated markets. At the root of this value stack issue was electricity pricing, with a lack of cost reflective price signals at both the network and the retail level. Of particular importance was the lack of nodal (or micro-nodal) pricing among networks, although any geographical price differentiation would be a start, as more comprehensive pricing signals would lead to opportunities that extract greater value for the consumer and retailer/network.

There is a **lack of common standards for equipment and products**. In other markets there are clear definitions for energy efficiency and demand response programs. This allows firms to create standardized products that they can sell. Mandates for energy efficiency are also a feature in other markets and create demand for energy efficiency products. In Australia large retailers tended to have research and development budgets to pilot demand response and energy efficiency programs, but never saw a need to put any budget into operationalizing these programs. Lack of equipment standardization drives up costs and makes it difficult to create standardized products. Lack of access to real-time smart meter data was seen as a major issue, limiting applications and causing some respondents to install their own additional meters. We were told that in some households there will be a meter from the retailer, the network and the innovative service provider. Given that installation is more costly than the hardware, this is wasteful. It was also pointed out that lack of standardisation of infrastructure and household equipment made it difficult to create standardized products, limiting customer reach, something not typically seen in other markets where participants had no trouble having uniform deployment. Moving into the future, it was pointed out that customer-driven change is already outpacing regulatory change. While **market institutions are said to maintain a deliberately slow pace** to create certainty for large investors, customers are already making their own investments for a whole host of other reasons regardless of the behaviours of large market participants and regulators. There is concern that this schism will lead to poor outcomes for customers in the future.

Looking into the future, there is a, ***"Lack of clarity, certainty, and agreement about what the future of the industry should look like"*** among policymakers and market institutions. There is a perceived lack of leadership from the government and the market institutions, or perhaps more accurately, a **lack of a clear leader.** Policymakers lack the vision of what the future of critical national infrastructure should like. Regulators need to rethink the role of the market and how they regulate networks. New regulations should encourage transparency, expedite institutional

[44] We were told that lack of cooperation/coordination between retailers, networks and third-parties meant that some customers had three meters at their home, one from each party. The interviewee said that the hardware costs of a meter that would meet the needs of all three parties was relatively small next to the installation cost of putting in three separate meters.

change and facilitate the development for new markets that take advantage of distributed energy resources.

C. Suggested Remedies

Interviewees suggested several possible remedies to barriers:

- A "sandbox approach" as used in the UK or Western Australia, where regulations would be relaxed for innovative services with limited market penetration. The sandbox could equally apply to new entrants with a small market share and larger incumbents willing to create a limited-enrollment pilot. Alternatively, there could be several levels of regulation, as in the financial sector, depending on a firm's size and the risk potential their products presented.
- Create national standards for demand response and energy efficiency. Making networks and retailers sign up to mandated goals and incentives for energy efficiency and demand response.
- Have rules governing data exchanges, technology (metering) standards, and the interoperability of device.
- Provide better guidance on secondary markets for distributed energy resources.
- Create nodal network pricing or some sort of locational network signal.
- Allow networks more agency to work with both customers and retailers.

IV. Suggestions for further research

We suggest several possible research agendas that the ECA can pursue in the near future, looking at how to address barriers to offering innovative consumer services:

1. Investigate alternative regulatory arrangements for small retailers and innovative market offerings. Look at arrangements in other markets such as the UK and Western Australia, or other industries such as the financial sector. This can be combined with a simplified set of rules for new entrants, or an institution that assists new entrants in understanding the rules in a penalty free environment. Ofgem in the UK found that when they established a regulatory sandbox, most of the requests for exemptions from the rules were not even violations to begin with. A similar arrangement in the NEM may also fulfill this dual role of allowing innovation and also highlighting where misunderstandings of the existing framework are occurring,
2. Explore whether network tariffs could be designed to incentivize retailers to provide standardised services to vulnerable customers, including energy efficiency offerings. A

past effort to create national energy efficiency standards stalled in 2013.[45] We propose a voluntary scheme, where retailers can opt-in to save on their network charges. Networks could facilitate this by creating a cheaper network tariff for retailers that meet certain requirements. In this way, networks can create a demand for the supply of services to vulnerable customers. Network tariffs could be designed to do this without conflicting with economic efficiency and the principle of reflecting costs.

In order to be economically efficient network tariffs need to reflect long run marginal cost. This allows customers to make efficient investment and behavioural decisions that minimize future network costs (given customers' preferred level of service). However, network tariffs that reflect marginal costs typically do not result in revenues sufficient to cover the total cost of the network—there will usually be some "residual costs" that the networks need to recover. These costs can be allocated amongst customers in a variety of ways without impacting economic efficiency,[46] and therefore could be used to provide the incentive described above without conflicting with economic efficiency. Further research could address the feasibility of such an approach, and explore to what extent residual cost recovery would be able to incentivize retailers to offer services to vulnerable customers.

3. Investigate the customer impacts of locational network pricing. How will this affect customers and vulnerable customers in terms of changing network costs, availability of new services, and customer investment in distributed energy resources? We could partner with a network to see to what extent higher priced nodes are aligned with customer socio-demographic variables, such as income or age. We could also examine potential remedies to address growing inequalities.
4. Review the new set of consumer focused demand response pilots conducted by ARENA, and compare to demand response best practices in other jurisdictions. Use learnings from the pilots and best international practices to create standardized demand response product for the mass market. This would include measurement and evaluation standards necessary to sell a demand response and guidelines for remunerating customers.

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[45] Australian Government, "Investigation of a National Energy Savings Initiative: economic modelling and potential regulatory impacts", July 2013

[46] Toby Brown & Ahmad Faruqui, "Structure of Electricity Distribution Network Tariffs: Recovery of Residual Costs", August 2014, prepared for the AEMC

5. Investigate the customer impacts of locational network pricing. How will this affect customers and vulnerable customers in terms of changing network costs, availability of new services, and customer investment in distributed energy resources? We could partner with a network to see to what extent higher priced nodes are aligned with customer socio-demographic variables, such as income or age. We could also examine potential remedies to address growing inequalities.
6. Review the new set of consumer focused demand response pilots conducted by ARENA, and compare to demand response best practices in other jurisdictions. Use learnings from the pilots and best international practices to create standardized demand response product for the mass market. This would include measurement and evaluation standards necessary to sell a demand response and guidelines for remunerating customers.

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