Post 2025 Market Design
Response to Consultation Paper

October 2020

ENERGY CONSUMERS AUSTRALIA

Version history

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Contents

A better energy future

Market design needs to evolve to serve the long-term interests of Australian households and small businesses in a future energy system that offers better than the past. At the same time, we recognise that market design is not everything. Business culture, government policy, the adequacy of the safety-net and trust provide a critical context for any market and shape outcomes for consumers. This bigger picture becomes even more important and complicated in times of transition and uncertainty.

Energy Consumers Australia is the national voice for residential and small business energy consumers. Established by the Council of Australian Governments (COAG) Energy Council in 2015, our objective is to promote the long-term interests of energy consumers with respect to the price, quality, reliability, safety and security of supply.

This is Energy Consumers Australia's second major submission to the Energy security Board (ESB) on the Post 2025 Market Design work program, following our September 2019 response to the Issues Paper. In that submission we outlined our vision for a future energy system and a framework for getting there.

The ESB has progressed its thinking in the last 12 months, with detail emerging about a package of inter-related market design initiatives in the Consultation Paper. In this submission we comment on the design issues most directly relevant to the experience of household and small business energy consumers in the future energy system through the lens of the framework we discussed in our first submission. Importantly, we also reflect on what the COVID-19 pandemic, and the summer bushfires, means for the way we think about and design of the future energy system, the design of markets and the challenges in managing the transition.

The role of energy in disrupted lives and businesses

We are facing a stress test of the energy system design

The context for the Post 2025 Market Design Review has dramatically changed since the process started in mid-2019.

The summer bushfires, which were of an unprecedented intensity and scale, have, among other things, prompted a national discussion about the resilience of our communities and the systems that support them. And following soon after the fires were extinguished, a pandemic hit which is arguably the biggest global shock in 100 years - and certainly the biggest shock outside of the two world wars - that has disrupted the social and economic life of the country at every level.

The Australian Bureau of Statistics (ABS) has tracked the impacts in real time through its new high frequency COVID-19 tracking project. This of course includes the usual quantitative measures relating to employment and household finances which have been hit hard. In the September 2020 run of the Household Impacts Survey, it found that 21% of Australians living in family households with children reported that their household finances had worsened in the last four weeks - giving an indication of the ongoing nature of the crisis.

Importantly though for the purposes of thinking about energy market design, the ABS surveys also capture in astonishing detail, the way the crisis has disrupted everyday social practices, starting obviously with the move to working from home, through to how caring and other responsibilities have adapted, and what this has meant for health (particularly mental health) and wellbeing outcomes. The data shows how our collective focus is now on basic human needs and survival.

Special research we commissioned to understand the experience of households and small businesses through the fires and now COVID-19 provides a window into how this is playing out in relation to energy services. In *Shock to the System: energy consumers experience of the Covid-19 crisis* undertaken in June 2020, we found:

- around half of people (49%) say they have more concern about their ability to pay household bills since the Covid-19 pandemic started with the number rising to 71% for those who have lost work during the crisis;
- electricity bills were the top cost of living issue for consumers with 73% rating electricity one of their top-3 concerns, ahead of groceries (56%) and housing costs (50%);
- 67% of energy decision-makers expect an increase in their electricity bill this year; and
- 20% of energy decision makers say they have already requested financial assistance to pay their electricity bill. Of these, half (10%) received help which was useful, and half (10%) did not receive help that was useful.

Moratoriums on disconnections, the deferral of networks costs and new hardship arrangements have provided a critical buffer for many consumers. However, recent statistics released by the Australian Energy Regulator (AER) reveal numbers indicating that consumer debt levels are rising – with the average 90-day debt increasing from $960 in March to over $1100 by the end of September 2020.[1] Similar trends are evident in Victoria, which is regulated by the Essential Services Commission of Victoria.

[1] https://www.abc.net.au/news/2020-10-16/thousands-of-australians-asking-for-energy-bill-help/12754032

The important point for market designers, is that these shocks act as a giant stress test on the system, finding and amplifying the weaknesses in the current services that need to be addressed in the Post 2025 Market Design Package

Policy makers we have been engaging with on the COVID-19 response have been surprised that anxieties about paying energy bills are as high or higher than housing and groceries, which are higher cost items for most consumers and would seem be of a more immediate and direct concern.

There is a trust deficit that market design needs to respond to

Our research suggests that this is because of the lack of control people feel they have over their energy use and bills, viewed through the recent experience of unexpected and sudden price increases that left people with the sense that the market was not working for them. When the pandemic struck, the poor state of the trust relationship between consumers and energy retailers, meant many people were reluctant to contact their retailer for help, a situation that was compounded by the tentative efforts by retailers to reach out to their customers to let them know additional help was available out of a concern that people would simply stop paying their bills – even if they could afford to.

In a sense, the margin for error for designers of a future energy market has never been so small.

It is inconceivable in this context to contemplate designs that increase or create new risks or complications for the hundreds of thousands of consumers whose incomes have been slashed and are relying on JobKeeper and Job Seeker programs, or whose businesses whose trade has evaporated and are making decisions about whether to try and ride things out or shut the doors permanently. Assumptions about how the energy market should work that had already been proven by experience and a succession of reviews to be incomplete or flawed, have been further exposed by COVID-19 and cannot sit unexamined and unchallenged in the background as they have in previous design exercises (for example the 2012 Power of Choice reform package).

Response to the Post 2025 Market Design Review

A succession of changes have been made to shore up the grid in the years since the System Black event in South Australia in 2016. However localised outages in recent summers, increasingly volatile weather and perhaps most significantly, the looming exit of ageing thermal generation, mean fears remain that we are not out of the woods. The Post 2025 Market Design Review (the Review) is the latest effort to settle the system security issue, this time through a structural redesign of the market (principally wholesale) to make it fit for purpose over the longer-term.

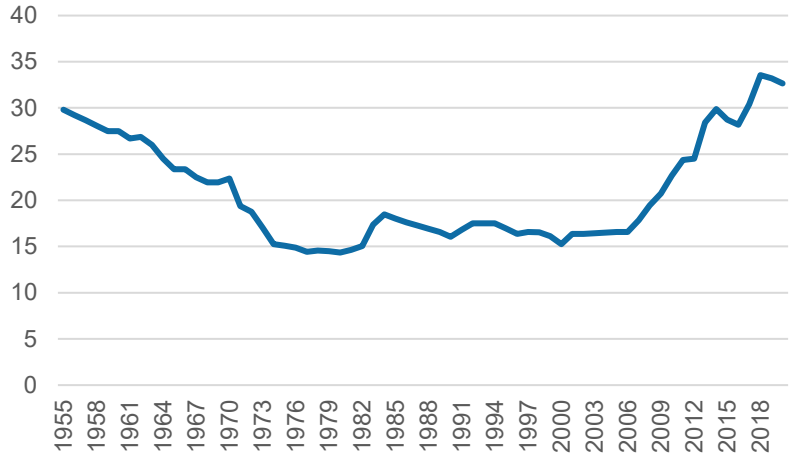
It is critical that the Post 2025 Market Design Package is seen as an enduring response to these concerns because Australian energy policy has been trapped in a summer-to-summer crisis cycle that leaves little space to work with consumers and the community on an ambitious, better energy future.

The recent interventions by the South Australian Government and the Australian Energy Market Operator (AEMO) to implement controls to manage the system security risks associated with the rapid growth of what is seen as 'unmanaged' rooftop solar PV are the latest example of emergency policy.

The size and complexity of the Post 2025 Review program has meant that we have focussed on the elements of most direct relevance for households and small businesses - the Two-Sided Markets and Distributed Energy Resources (DER) workstreams (market design initiatives). That said, we are following the development of the other design elements to assure ourselves about two things in particular: firstly, that energy affordability is being explicitly considered and not being seen as secondary to system security.

Electricity prices are at historical highs (see Figure 1). As Rod Sims, Chair of the Australian Competition and Consumer Commission, stated in September 2017 in a speech to the National Press Club, as he commenced the Retail Electricity Price Inquiry in the words of an old Irish joke *"I wouldn't start from here".*[2]

Figure 1 Australian electricity prices (real c/kwh)



Electricity prices doubled for many consumers in the ten years from 2008 driven by a range of factors including a more peakier pattern of electricity use (driven by air-conditioning use and the growth of rooftop solar PV systems hollowing out consumption, particularly in the middle of the day), the asset replacement cycle for ageing network infrastructure, changes in climate and incidence of extreme weather impacting on network capacity, in some jurisdictions higher reliability standards, and then wholesale price rises associated with the exit from the market of the Hazelwood power station.[3]

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[2] Rod Sims, *Shining a light: Australia's gas and electricity affordability problem*, available https://www.accc.gov.au/speech/shining-a-light-australia%E2%80%99s-gas-and-electricity-affordability-problem

[3] See Energy Consumers Australia July 2017 submission to the ACCC Retail Electricity Pricing Review https://www.accc.gov.au/system/files/Energy%20Consumers%20Australia.pdf

While electricity (and gas) retail prices have fallen somewhat since 2018, Rod Sims expectations that falls of 25% were possible if the recommendations of the Retail Electricity Pricing Inquiry were implemented have not been realised.

It is critical that we do not repeat the mistakes of the past – both in policy, regulatory decision making and market design - that caused these poor outcomes for consumers. A concerted effort to reign-in network costs, improve competition and restore the price safety-net is now delivering results, and our response must be to double-down on affordability, not let the focus shift back to system security at the expense of consumers being able to pay their bills and run their businesses.[4]

Managing the risks of excessive transmission costs

Managing the risks of over-investment in electricity transmission infrastructure is a key element of the Post 2025 Market Design Package.

We have seen examples in recent weeks of significant upward revisions in the costs of transmission projects, which may be a worrying sign of things to come, and these act to undermine confidence that consumers will get the benefits they have been promised.

At the same time, Transgrid has lodged a rule change proposal with the Australian Energy Market Commission (AEMC) to allow it to 'front-end' the way it recovers costs from consumers – a proposal that on its face would seem to run counter to the idea that consumers should pay in line with the benefits they receive.[5]

The transmission access and pricing elements of the package, which are an evolution from the AEMC's Coordination of Generation and Transmission Investment Proposal (COGATI) proposes to manage costs by sharpening price signals for generators. The NERA modelling commissioned by the AEMC indicates that the changes could reduce costs for consumers by more than $3 billion – and potentially up to $4.6 billion if additional competition benefits are realised – by 2040.[6] This is a significant potential saving for consumers and it is incumbent on stakeholders who challenge both the use of locational price signals to secure these savings and the analysis on the grounds that it fails to factor in the uncertainty it creates for investors and cost of capital increases, to offer detailed alternative plans to unlock the savings and deliver the planning benefits for consumers.

It is also critical that the transmission elements and the other elements of the design are consistent with our long-term vision for the energy system which is far more distributed and service-based than the current model, and where households and small businesses are in control and no one is left behind.

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[4] See latest ACCC Electricity Price Monitoring Report https://www.accc.gov.au/media-release/electricity-prices-fall-and-covid-spikes-residential-demand

[5] https://www.aemc.gov.au/rule-changes/participant-derogation-financeability-isp-projects

[6] https://www.aemc.gov.au/sites/default/files/2020-09/NERA%20report%20Cost%20Benefit%20of%20Access%20Reform%202020_09_07.pdf

Rapid advances in distributed energy technology (which will likely be spurred-on by IoT and 5G communications[7]) and the revealed preference of consumers for more local energy solutions, means there are significant stranding risks associated with investments in long-lived, fixed infrastructure. Significant 'option-value' must be built into the design to ensure that we do not 'close-out the future'.

Need for a shared vision – or the end state - of the future energy system

The structure of the Post 2025 Review Program, which comprises seven market design initiatives that are running in parallel, without an overarching architecture or options for architectures that describe the 'end-state' for the system, makes it difficult to make an assessment of the benefits, and potential risks in the package. This lack of clarity has tended to feed concerns that the design may be too 'top-down', seeking to replicate a level of centralised control that the market operator had in the traditional energy system.

Addressing system security through wholesale market reforms

We are generally supportive of the ESB's approach to reforming the wholesale market which looks to build on the current, energy-only model, rather than moving towards one where market participants receive most of their revenue through capacity payments. Capacity markets must be finely calibrated, with energy resources procured through open and transparent reverse auctions or similar mechanisms, to ensure that risks and costs do not fall on end users rather than the market participants who are best placed to manage them.

That said, it is clear that we need to reform the market to manage the variability associated with the new energy resources and adapting scheduling and establishing new 'ahead markets', which essentially give the market operator and market participants more time to plan ahead and make decisions, appears to be a sensible approach.

Challenges of shifting risk to household and small business consumers

Price signals in and of themselves, without consideration of the consequences for energy as an essential service in homes and businesses, coupled with a faith that new energy services offered by intermediaries will emerge risks consumers being both worse off and trust further diminished.

Where we would urge the ESB to be cautious in designing to incentivise, and potentially penalise, market participants for the decisions they make over different timescales, is that it may have unintended consequences for end users who may not have the foresight, means or discretion to manage their energy use. Very few of today's energy users would be in a position to participate in a two-sided market as a scheduled load, and the intermediaries (energy service providers) that would manage the task on their behalf do not yet exist.

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[7] For a comprehensive survey of the digitisation of energy, including the implications of IoT and edge computing, see Energy Futures Lab briefing paper by Dr Aidan Rhodes, Imperial College London, https://spiral.imperial.ac.uk/bitstream/10044/1/78885/2/4709_EFL_Digitalisation_briefing_paper_WEB2.pdf

This is one of the reasons we strongly support a transitional approach to the development and implementation of the Package, which takes account of changing circumstances and technology developments.

A staged roadmap to explore opportunities and benefits and avoid harms

The ESB has proposed a three-stage approach, with short, intermediate, and longer-term deliverables. We recommend the ESB goes a step further and develops a more sophisticated 'roadmap' plan - drawing on the structure of the Western Australian Distributed Energy Resources Roadmap (WA DER Roadmap). The ESB's Roadmap should adopt (at least) a 30-year time horizon which matches the asset lives of the infrastructure, which is currently being planned or built, and is consistent with Net Zero emissions commitments.

The Roadmap should also provide greater clarity about the vision for the future of the system in terms of its architecture - in particular where the locus of control will lie and the roles and responsibilities of market participants, users (who will also likely be generating and trading their own power), the market operator or operators, and other institutions.

Energy Consumers Australia welcomes the emphasis in the early, framing sections of the Consultation Paper on consumer needs and interests being the core consideration in the design process. This is critical because in technical exercises like this, designers (understandably) can become preoccupied with solving the issues from their perspective which tends to have a supply-side, infrastructure, bias.

The proposal for a voluntary approach to the introduction of a two-sided market, with consumer value and risk guiding the process rather than operational control imperatives, is one we strongly support. Designs which equate household and small business energy use (load) with a generator (supply) whose sole purpose is to participate in the market, create an imbalance in capability and interests that could lead to poor outcomes for consumers. The future energy system, including the structures and platforms that support it, are likely to look very different to today's arrangements that were organised around a centralised, one-way model. Our strong view is that the best way to design for this uncertainty is to design around the one fixed point we have which is the consumer.

Lessening the energy divide

We also strongly endorse ESB Chair, Dr Kerry Schott's public comments about the need for the Post 2025 Package to lessen the energy divide. Many households and small businesses are already using technology to substantially reduce their energy bills; however, the opportunity is not evenly shared. The energy divide results from circumstances rather than choices. People on low incomes who cannot afford the upfront costs of rooftop solar PV, renters, and other groups face barriers that must be overcome through the Post 2025 Package and supporting policy. The need to ensure that people are not left behind in the energy transition is a consistent theme in our consumer surveys and engagement and must be a guiding value for this Review. The extraordinary social and economic disruption caused by the COVID-19 pandemic, as well as the summer bushfires, mean this pragmatic, outcomes-focussed approach is even more important.

Dr Schott has referenced community batteries in the context of lessening the energy divide and solving system challenges more locally. We are also strongly in favour of making hot water systems in homes and small businesses – hot water being a cheap and ubiquitous form of energy storage – 'smarter' to reduce energy bills and contribute to a more 'flexible' demand side of the energy system.

Collaboration and engagement on design

Importantly, Dr Schott's comments and the emerging design for the two-sided market element of the post 2025 Market Design Package reflects significant engagement between consumer advocates and the ESB through a Customer Working Group (the Working Group) that was established in recent months.

The Working Group, which Energy Consumers Australia is facilitating, developed a framework to share with the ESB consisting of a problem statement and supporting design principles included in this submission at Annexure 1. The Working Group has drawn on the lessons from ARENA's Distributed Energy Integration Program, where consumer advocates, market bodies and industry co-designed proposals to reform network pricing to accommodate distributed energy resources (DER).[8]

The ESB's revised thinking in the two-sided markets part of the Consultation Paper was influenced by the Working Group's problem definition framework. However, Energy Consumers Australia and the Working Group believe that a much deeper pivot and deeper understanding is needed by the ESB and the market bodies towards a discussion on a Post 2025 design based on social practice applied through a contemporary design lens that is thoughtful about the choices that are being made about the platform and the businesses operating within it to make sure that it works for people.

Energy Consumers Australia plans to continue playing this role with other consumer advocates through this framework in the next phase of the process.

This ongoing engagement, along with the ACIL Allen consumer behaviour framework developed with Energy Consumers Australia to guide policy, and now being adapted by the ESB as a market design tool, is key to fleshing-out the design and testing its applicability in the real-world. The experience of smart meter rollouts in Australia and overseas that have not delivered on what was promised, as well as stalled tariff reform, shows that reform will not succeed unless close attention is paid to the consumer journey and the value proposition is clear.

The DER Integration sprint is a new significant and positive development in the ESB's Post 2025 work.

[8] The generic lessons from this process, led by ACOSS, TEC and Energy Consumers Australia, was the New Energy Compact

The design sprint Dr Phil Blythe and Liz Fletcher are facilitating as part of the DER workstream is providing a forum for Energy Consumers Australia and other consumer organisations to contribute this perspective.

We have encouraged the DER Sprint leads to involve additional advocates and in particular members of the Consumer Roundtable DER enabling group. We also shared the Working Group's framework in Annexure 1 with the DER Sprint leads and we are very pleased that they have developed guidelines based on those principles to help reflect the perspective of the customer throughout the sprint design exercise and the development of their high priority use cases. The strength of the DER design sprint is that it is grounded in the consumer and physical reality at the 'grid edge', where the weight and dynamism of the new energy market is most evident.

Energy Consumers Australia has engaged Professor Cameron Tonkinwise, UTS School of Design, to facilitate a process with consumer groups to explore how the Post 2025 design (particularly the DER use cases developed in the Design Sprint) reflects social practice and contemporary transition design methodologies. [9]

We are keen for the ESB to participate in this process as an opportunity to co-design key, consumer-facing aspects of the package.

In doing so, our ambition is to push the thinking beyond deploying DER to solve today's system challenges (e.g. network congestion), to deploying DER to support valued new practices in homes and businesses. This would be a major pivot from 'engineering' to 'people' that we think is necessary to deliver an enduring Post 2025 Package.

We are also conscious that governments, AEMO and networks have a nearer-term challenge of managing the risks to the system posed by rooftop solar PV. We believe that these issues are best addressed through open and respectful dialogue with the households and small businesses that have invested in the technology, with support provided to help them upgrade to meet new system security standards. We have recently engaged CutlerMerz to review international approaches in relation to 'DER control' of DER and the associated social licence issues, with a view to developing a framework for decision-makers. We are in the early scoping phase of this project and would value the ESBs input to maximise its relevance and effectiveness for this purpose.

Unlocking flexibility in energy use and generation

In this submission we tie these elements together in making a detailed case for a 'flexibility plan' to empower consumers and increase the efficiency and resilience of the system. A major element of the early phase of the plan is unlocking value associated with flexible loads like hot water, which are a low cost and most importantly convenient, form of energy storage that is a proven technology and in almost every Australian home and small business. As the smart hot water case study shows, progress on open technology standards is critical to realising these benefits.

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[9] Professor Tonkinwise's presentation at Energy Consumers Australia foresighting Forum 2020 on transition design is available here.

A fit-for-purpose consumer protection framework is required

The other major element of the Post 2025 Package that will be a focus for Energy Consumers Australia in the next phase is a fit for purpose consumer protection framework, coupled with a flexibility plan.

We are thinking about this in two parts: the first being building on our recent experience in defending the public benefits of the New Energy Technology Consumer Code (NETCC) before the Australian Competition Tribunal; and the second, principles-based frameworks that will be required in the longer-

The structure of this submission

In the remainder of this submission we review the package of market design initiatives in the Consultation Paper, making suggestions in three areas to inform the recommendations to be developed for Energy Ministers to consider later this year.

1. Structures to integrate and organise the elements of the package around a 'roadmap' with a clear destination and staging based on value, risk and trust outcomes for energy consumers. Importantly, the starting point for the Roadmap should be the challenging circumstances households and small businesses are currently facing because of the summer bushfires and COVID-19.
2. Suggestions about designing a platform for new energy services providers whose interests are aligned with energy consumers.
3. The elements of a proactive flexibility plan to give consumers the information, tools, technology and support to get control over their own energy outcomes, and if they choose to do so, contribute to a flexible demand side of the energy system to reduce costs for everyone.

A roadmap based on value, risk and trust

Our starting point, which is consumers and communities facing challenging circumstances and the scale and complexity of the transition of the energy transition, means the only way to organise this kind of reform is through a roadmap structure. In the first instance it is clear that an overarching roadmap structure is needed to integrate the 7 Market Design Initiatives (MDIs).

A Roadmap is even more important in the context of a Post 2025 Market Design Package that interacts with, and in some cases builds on, other change processes. The layering of change over the past five years, through different points of the NEM governance structure to solve discrete problems, makes it very difficult to form a view about how the elements fit together and the merits of the package overall. We need this clarity about the overall future, not just to make sure that the market design is coherent but to also engage the consumers in the community about the energy transition in a way that is consistent with their expectations and values.

Critically, the staging of the Roadmap must be based on a rigorous assessment of consumer outcomes, opportunities and risks. We think this lends itself to a set of evaluation criteria, that could be co-designed with consumer groups and other stakeholders as part of the next phase of the program. The framework developed by the Working Group in Annexure 1 could serve as a starting point for this piece of work. We should emphasise that the staging in the Roadmap should not be managed static or pre-determined way, rather satisfying evaluation criteria being a gateway for progress.

It is becoming increasingly clear that stakeholders need clarity on the system and grid architecture models of the future which will underpin the delivery of the new services. This clarity will also support sensible market based approaches to solving short term system security issues in a no regrets affordable easy way.

To inform the ESB's thinking about a Roadmap structure we have reviewed the WA DER Roadmap to identify the key elements.

Lessons from the WA DER Roadmap

The Western Australian electricity industry differs in some respects to some of the NEM States, as the WA participants remain predominantly Government owned and managed, with more limited retail competition and retail prices for households and small businesses set by Government on a postage stamp basis. AEMO operates the Western Australian wholesale market.

In May 2019 the WA Minister for Energy established the Energy Transformation Taskforce (the Taskforce). The purpose of the Taskforce is to deliver the Western Australian Government's Energy Transformation Strategy.

The Taskforce has established three workstreams covering DER Integration, whole of system planning and foundation regulatory frameworks to deliver the strategy. Following a consultation and engagement process the Taskforce published its first deliverable in December 2019 – the WA DER Roadmap.

The WA DER Roadmap describes similar challenges to system stability in the populated South West region (SWIS) from high DER penetration to those in the NEM outlined in the ESB's Consultation Paper. The DER Roadmap sets out a plan to transition the SWIS to a decentralised, democratised and highly data driven power system to achieve its high-DER vision by 2025.

The Taskforce is progressing with the implementation of the 36 actions in the WA DER Roadmap. Some of those actions focussed on a series of specific interrelated actions to conduct a DER Orchestration Pilot (Actions 22 & 23), and to define the DSO and DMO function set (Actions 24 to 32).

On 14 August 2020 the Taskforce released an Issues Paper for consultation – Distributed Energy Resources Orchestration Roles and Responsibilities. The Issues Paper notes that it is the first step in addressing WA DER Roadmap Action 24: DSO/DMO – Roles and Responsibilities (medium priority).

This Issues Paper provides further detail on evolving the DSO and DMO models in the WEM, as well as how these new functions will be established and their interaction with traditional roles in the system (such as retailers). The Issues Paper notes that feedback is important: "…as there will be significant energy sector impacts associated with the transition." The Issues Paper does not address detailed issues of a technical, contractual or regulatory nature, but identifies these issues for future resolution and proposes high-level positions that will allow further detailed design work.

Energy Consumers Australia believes there are lessons for all participants in the Post 2025 design Review from the detailed work that has been undertaken to prepare the WA DER Roadmap.

The advantages of a structured approach

The WA DER Roadmap follows what could be described as a text-book strategic planning approach by creating a plan of action to reach a destination by:

1. adopting a clear succinct high-DER vision as the destination and outlining 3 objectives that will be achieved by the vision;
2. conducting a comprehensive situational analysis to:
    - gather information to identify the barriers to achieving the vision; and
    - analyse the information on barriers by 4 key themes;
3. developing 7 principles to guide/filter the choices available to change arrangements to overcome the barriers;

4. identifying 14 elements needed to overcome the barriers;
5. developing 36 actions with clear action owners and key milestones to create accountability to achieve the 14 elements of the Roadmap; and
6. building in monitoring and the ability to adapt as they implement the plan.

The need to make the customer the centre of the design

The Taskforce notes the need for an urgent response to the system challenges and opportunities, which led them to create an output orientated DER Roadmap. However, the 7 Principles identified to guide the actions ion the DER Roadmap (System security and reliability; Value for money solutions are identified and implemented; Technology neutrality; Customer protections; Regulatory flexibility; Feasibility and practicality and Impact on State finances) are in our view Government and system centric rather than customer centric. The 4 themes were identified to group and manage the actions in order to cope with the amount of change needed in the strategic plan in a complex market

A staged vision

The Taskforce is not primarily focussed on their strategy displacing thermal generation – it is mentioned as a possible outcome if coordinated active DER is achieved in the future. There is greater focus on positioning the SWIS for resilience as the generation mix changes

Low control solutions are preferred to lessen the energy divide

The Taskforce stresses the need for low tech solutions such as the development of smart pricing and changing government policies to fix distorted incentives for investment. There is strong commentary in the Roadmap about the distorting effect of current government policies and inefficient tariffs and how this creates incentives for people to install solar PV (but not batteries) increasing the energy divide

Standards will be needed to underpin flexible demand

The development of standards is a key issue to maximise flexible load control through the development of common, open active management capability

Preserve a decentralised approach in the transition

The DER Roadmap acknowledges the existing roles of retailers and networks and builds towards a possible market for network services. It does not start with the new services market

Monitoring and adaptability should be elevated

The DER Roadmap recognises that social equity issues are driven by circumstance rather than choice. The monitoring and adaptability part of the Roadmap is the least developed and as the starting point for the Roadmap has now been superseded by COVID this will have created greater social inequity issues that will need to be reviewed

Communication and education in line with social practice

The DER Roadmap includes messaging to show customers the role of the new services and its interaction with social practices in their own home

Customers need clear and simple information

Integration of the Data Strategy into the DER Roadmap underpins consumer protections to ensure access to data through the evolution of new business models

The DER Roadmap is integrated in a wider strategy

The DER Roadmap is one of three workstreams and forms part of a wider energy system transformation strategy

Using case studies to test the package

We think the best way to begin to build an ESB Roadmap for Post 2025 is to stand in the shoes of a consumer who would be participating in or impacted by the new Post 2025 mechanisms. We have started exploring the package in this way in the Working Group.

As part of engagement on its Consultation Paper the ESB presented its Post 2025 Market Design Package to the Working Group. The Working Group gave feedback to the ESB that it is not clear how the overall package - which is very technical - fits together and what the implications are for all consumers in plain English. Energy Consumers Australia subsequently developed a smart hot water case study that the ESB could use to describe its design starting from interactions within the home. The subsequent discussion with the Working Group was very helpful and we are encouraging the ESB and AEMC to work with this case study to explain its vision. The smart hot water case study is included at Annexure 2.

We think the opportunity to extend this practical consumer perspective being the next phase of the SER design sprint process. Our experience in the DER Sprint program to date is that it is bringing a real focus on practical parts of DER and two-sided markets and is following a systematic process that is focussed on practical outcomes. We believe that further analysis and planning will be needed to develop the DER Integration strategy into an ESB Roadmap for Post 2025.

Another key issue we have raised with the ESB, is not only how two-sided markets comes together with DER but how do those elements fit together with the broader Package particularly mapping and sequencing in a Roadmap that are emerging out of the design sprint. We would like to see other MDIs focus in a similar way to DER and two-sided markets and in a way where implications to consumers and business are clear.

New energy businesses working for all households and small businesses

Price signals may be necessary – to reward behaviour - but not sufficient

In the current context the Post 2025 Market Design Package must go beyond simply 'getting the pricing right'. A price signal that is communicated to a customer, months after they have flicked the switch to turn on an appliance and use electricity through a quarterly bill, cannot be a basis for behaviour change and is ultimately punitive. For us this implies two things for the Post 2025 Market Design Package and its framework: firstly, the market structure must align the interests of energy companies with their customers so that energy use management is a core part of the service; and secondly, well targeted government schemes must be in place that increase the capacity of households and small businesses to manage their energy use.

Energy Consumers Australia's Power Shift research provides guidance on how to package the information, technology, and support for consumers so that they can take advantage of choice in markets and get a benefit. We welcome the move by the ESB to engage ACIL Allen, who we worked with us to develop the *Supporting Households Framework*, to adapt their model to inform the next phase of the design.[10] We understand that the ESB intends to develop a set of consumer archetypes reflecting different motivations, abilities and opportunities, to test the design options and new products and services to see how they work for different households and small businesses.

We also need to interrogate the ESB's assumptions about the role energy service providers will play on behalf of consumers in the future energy system that is the outcome of the Post 2025 Market Design Package. It has been put to us that concerns about consumers managing the risks of participating in the two-sided market are unfounded because intermediaries – for example 'Siri' – will perform this role on their behalf. While we agree that energy service providers may emerge in the future, this "flowering" of intermediaries and their role in the energy market will certainly not happen overnight, and consumers will likely suffer detriment in the meantime. We think it would be instructive for the ESB to systematically review the experience of intermediaries in other markets, particularly those that have been disrupted by new digital platforms such as hotel accommodation and taxis. These platforms have a mixed record of delivering good consumer outcomes that are consistent with community expectations about conduct, and steps must be taken to do better in energy. This is why we have engaged Professor Cameron Tonkinwise, UTS Design School, to facilitate a process with Energy Consumers Australia, consumer advocates, and by invitation the ESB, to explore ways to put people and community at the heart of the future market envisaged by the Post 2025 Market Design Package.

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[10] https://energyconsumersaustralia.com.au/projects/power-shift/power-shift-targeting-consumersextesive

Consumer values, expectations and trust

Trust is ultimately earned from a consistent commitment to do what one says one will do and to be what one claims to be.

Legitimacy must also be maintained and this depends on competent performance being directed at the attainment of a clear and legitimate purpose. Energy Consumers Australia has done extensive research[11] about consumers' values and expectations about the future of energy and how the transition should be managed. This research suggests consumers and communities are looking for future services that:

- protect them from exposure to new risk;
- have their best interests at heart;
- give them the choice and simple controls over how appliances and technology in their own homes are used;
- be consistent with social practice;
- be cleaner, cheaper and easier to manage;
- give them tools and information to empower them to look after themselves; and
- be fair and lessen the energy divide.

Importantly, when asked about the future consumers don't just describe the services, many express a desire to be informed about and/or participate in decision about how to get there. Energy Consumers Australia sees this as being key to building trust and social licence to progress the major reforms contemplated by this Package.

There is also broad agreement that the consumer protection framework will need to be reformed to be fit-for-purpose in the new energy market. As the Consultation Paper acknowledges, the current energy-specific protections under the National Energy Consumer Protection Framework (NECF) relates only to the 'traditional' sale of energy through a retailer and do not cover, for example, the sale of rooftop solar PV or many other technology-based offers. Beyond this coverage issue, the NECF is also limited in the form of the protections, which tend to be prescriptive and process based – for example, relating to the content of a paper energy bill, rather than specifying an outcome, and leaving it to the energy service provider to decide how to meet (and hopefully beat) the standard.

The first point we would make in relation to how the ESB progresses the consumer protection design, is that it must start with the core market design itself, ensuring that it is consistent with the nature of energy as an essential service. How intermediaries are incentivised and behave, or risks that are associated with mechanisms that expose consumers to wholesale market or other risks, must not be seen as a necessary 'residual', to be addressed by secondary line of defence in the form of a consumer protection framework. Exploring the use cases developed in the DER Design Sprint through the Professor Tonkinwise process will be an important test of the extent to which the design meets this standard.

[11] Future Energy Vision Consumer Expectations Research

The second point we would make is that it is important that consumer protections evolve with the market, which means that change should be managed according to the roadmap structure we are proposing for the Post 2025 market Design Package. The AEMC Consumer Protection Review made recommendations about how the framework could evolve, with specific recommendations about short-term changes, but this work needs the support and structure of a roadmap to move forward in a clear and systematic way.

In terms of the consumer protection design itself, we would recommend the ESB and AEMC pursue near-term and longer-term actions consistent with the sequenced Roadmap approach. Firstly, to identify consumer risks associated with the emerging designs, and explore the extent to which they could be managed through the NETCC. The NETCC, which was authorised by the Australian Competition and Consumer Commission, is a voluntary industry-led scheme that will provide a level of protection for consumers who are purchasing solar and other products not covered by the NECF. Its introduction was delayed by an appeal from a 'buy-now-pay-later' or 'BNPL' service provider to the Australian Competition Tribunal (the Tribunal). The outstanding issues with the NETCC have now been resolved through recent authorisation from the Tribunal. As one of the organisations which developed the NETCC, Energy Consumers Australia, participated in the hearings, and is keen to see the new protections introduced and made available to consumers as soon as possible.

Tracking experience and collecting evidence can inform longer-term change, noting the AER's Statement of Expectations experience and the reporting gaps. We also think the ESB's Data Strategy[12] could be an opportunity to collect evidence that would inform future consumer protection design.

The ESB should signal a direction of travel towards universal access to the full range of energy services as the long-term goal.

Recently, Energy Consumers Australia has been focussing on what can learn from the risk-based frameworks being developed in the UK as part of the Reshaping Regulation series[13]. Importantly, these frameworks consider how to manage future markets where bundled services are provided, which don't fit neatly into sector specific consumer protection approaches. We see the AER's principle-based Statement of Expectations as a necessary step in this direction.

The practical, physical context in which households and small businesses use energy has a major bearing on outcomes and has to be factored into the design. The poor state of our building stock and the appliances in most homes and businesses, place real limits on the extent to which people can change their energy use to respond to a price signal, even if they wanted to.

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[12] http://www.coagenergycouncil.gov.au/publications/energy-security-board-data-strategy-consultation-paper

[13] http://www.challenging-ideas.com/pubs/reshaping-regulation-power-from-the-future/

While housing policy is outside the ESB's mandate, and the scope of the Post 2025 Market Design Review, the ESB should nevertheless take the opportunity to make the link between its work and the need to accelerate progress on energy performance standards for new and existing Australian homes. Any ambition energy sector leaders may have to move towards more dynamic 'cost reflective' pricing for heating and air-conditioning must be shelved until the thermal performance of our homes improves to the extent that people have discretion about when they switch on their appliances.

And finally, we know that major reform is only possible where there is broad community understanding and buy-in for change. Earlier energy market reform exercises, which have been run as technical projects for energy industry experts have failed to engage with the border context in which households and small businesses interact with energy and, as a consequence, did not achieve the hoped-for outcomes.

The jarring experiences of disruption whether that be bushfires, other extreme weather events and the consequences of the pandemic provide a unique window to reflect on and internalise these lessons, and design in an informed and confident way that charts a course to better energy outcomes for energy consumers. The need to design for new energy service providers whose interests are aligned with their customers, supported by a consumer protection framework that is fit for purpose in the new environment.

A flexibility plan to empower consumers

Why maximising flexible demand should be a priority in the ESB's Roadmap[14]

In addition to getting the market design right, ESB, working with Governments, need a practical plan to empower consumers to participate. We are thinking about this in terms of prioritising a flexibility plan.

As thermal generators retire over the next two decades, the generation mix in the NEM will increasingly be dominated by renewable energy. The ESB Consultation Paper's work to develop an ageing thermal generation strategy[15] primarily focusses on system side solutions to the grid management problem caused by the uncertainty of exit timing and does not see flexible demand and DER filling this gap. The ESB's Post 2025 Market Design Review has highlighted that there is now an urgent need to address the affordability, security and reliability challenges arising as the NEM transitions to accommodate lower emissions by 2050 and rapid technological change.

Flexible demand can also deliver a more affordable future energy system that is more distributed and more democratised. Flexible demand will be increasingly important as a low cost means to:

- balance generation and load in a market dominated by variable renewable energy;
- manage expected changes in load; and
- as consumers continue to invest in rooftop solar PV, and in the future in energy storage provide an opportunity to harness the potential of these assets to manage grid stability issues.

To date Australia does not have a good track record of cultivating flexible demand, particularly at the household and small business level. While large customers will soon have access to the wholesale price via the wholesale demand response mechanism, either directly or through a third party, households and small businesses are not able to participate. There are some trials currently being conducted that enable small customers to participate in a virtual power plant, but these trials are in very early stages and barriers to the widespread orchestration of small customers' flexible demand remain.

The ESB has a critical role to play in developing the pathway forward to develop flexible demand at scale in the NEM. A core part of developing this part of the ESB Roadmap dealing with flexible demand will be:

1. understanding the barriers to achieving flexible demand at scale;

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[14] This section of our submission and Annexure 3 draws on material authored by Lynne Gallagher and Elisabeth Ross on flexible demand to be published in 2021 in Variable Generation, Flexible Demand. Edited by Fereidoon Sioshansi

[15] MDI B discussed in pages 47-58

2. setting out a concrete action plan to remove those barriers and
3. creating a framework that incentivises consumers to easily and conveniently offer demand flexibility into markets and be appropriately rewarded for doing so.

What is flexible demand?

By "flexible demand" we mean any action taken, or consented to, by a customer to change their load profile compared to their usual behaviour, whether by shifting load to a different time period or simply reducing (or increasing) demand.

Flexible demand includes both load (such as consumption from use of appliances) as well as behind-the-meter generation. Solar PV, batteries or other storage (including smart hot water and electric vehicles) can be used to change the load profile by shifting generation into self-consumption and into storage thereby reducing exports.[16]

Developing a flexible demand plan within the ESB Roadmap

In order to maximise demand flexibility in its Post 2025 Market Design Package, the ESB needs to develop a strategy and Roadmap that delivers opportunities for greater demand flexibility in a way that consumers find rewarding, without too high a cost in inconvenience. In Annexure 3 we detail more of our thinking on the importance of flexible demand and some of the steps that will be needed to develop a robust flexibility plan.

The role of standards in flexible demand

Some steps have already been taken to identify regulatory barriers to the development of a flexibility plan. There is increasing evidence, both locally and internationally, that the development of open common standards will be critical to the successful development of flexible demand in a way that maximises consumer agency and minimises consumer inconvenience. We are also concerned that the approach to development of standards in Australia is slow and that opportunities for Australia to harmonise standards in DER with standards in place in other jurisdictions should be maximised to reduce local and global market fragmentation.[17] We have included

[16] The WA DER Roadmap (p 24) recognises the potential for flexible load to play a meaningful role in mitigating the challenges encountered in their high-DER future and also to assist customers manage their energy costs. The Roadmap includes a definition of flexible load (p 24) which is limited in that it focuses only on load and does not go as far as including behind the meter generation and storage. The other deficiency with the WA definition is that it highlights the benefits to the system from orchestration of the flexible load but does not refer to the need for customers to be incentivised to respond to the load control or price signals.

[17] The WA DER Roadmap makes a similar observation at page 25 about the development of recent updates to the Australian Standard (AS/NZS 5139:2019) that applies to installation of behind the meter battery storage. The Task Force expresses concern that the final Standard could increase costs and delay uptake rates. They note that the Standard includes additional requirements such as non-combustible materials for installation on walls as well as limits on the proximity to windows, ventilation, hot water systems, air conditioning units or other appliances. The standard places a higher requirement than the international standard (IEC 62619) which applies in Europe, and some major manufacturers have argued that the standard is too strict compared to other jurisdictions where batteries that meet IEC 62619 are deemed sufficiently safe to be installed inside houses.

additional material on the role of standards to support flexible demand in Annexure 3.

The AEMC is currently consulting on several rule change requests seeking to manage DER resources to respond to exceptional and emergency grid volatility and other system security issues similar to the ones identified by the ESB in the Consultation Paper.

None of those rule changes seek to make consumers part of the solution. Instead they seek to impose engineering solutions on consumers. We have made several submissions[18] to these rule change requests emphasising the core point that these system focused solutions such as the introduction on minimum technical standards are not necessary at this time and are not least regret approaches. In our view, more should be done to explore the ways in which consumers will experience and interact with these standards and this as well as exploring ways to empower consumers to unlock flexible demand.

We believe there is an opportunity for the ESB and the DER Standards Governance Committee to bring this much needed consumer focus[19] to these various ad hoc rule change proposals around standards for DER Integration.

It is critical that technical standards should not be designed to take control of consumers assets away from them, rather they should be designed to provide consumers with control, the data and privacy and the capability to manage their use and generation. What may be appropriate to deal with exceptional and emergency circumstances and the medium-term issues in South Australia, should not stand in the way of consumer-centric technical standards that will support the development of a market for flexible demand and DER services. Our concern is that the current measures focus on technology and the incumbent system participants and are not being approached from a customer centric point of view.

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[18] Energy Consumers Australia Submission on the Initial DER Minimum technical Standards Issues Paper, dated 25 September 2020 and Energy Consumers Australia submission to the National Electricity Amendment (Technical Standards for Distributed Energy Resources) Rule 2020 dated 5 August 2020 and Energy Consumers Australia submission to the Government of South Australia Department for Energy and Mining Consultation on smarter homes dated July 2020

[19] In our submission to the ESB dated on the governance of DER technical standards, dated 5 August 2020, we support the governance arrangements and call for the CEO of Energy Consumers Australia to be a member of the Committee.

Conclusion and recommendations

In this submission we reviewed the package of market design initiatives in the Consultation Paper, making suggestions in three areas to inform the recommendations to be developed for Energy Ministers to consider later this year:

1. Structures to integrate and organise the elements of the package around a 'roadmap' with a clear destination and staging based on value, risk and trust outcomes for energy consumers. Importantly, the starting point for the Roadmap should be the challenging circumstances households and small businesses are currently facing because of the summer bushfires and COVID-19.

2. Suggestions about designing a platform for new energy services providers whose interests are aligned with energy consumers.

3. The elements of a proactive flexibility plan to give consumers the information, tools, technology and support to get control over their own energy outcomes, and if they choose to do so, contribute to a flexible demand side of the energy system to reduce costs for everyone.

Energy Consumers Australia identifies seven specific actions for the ESB for the next phase of the Post 2025 program:

1. ESB to review the Post 2025 Package in the new context of the disruption posed by extreme weather events and the impact of COVID 19 to ensure it supports recovery and longer-term resilience of the future energy system.

2. ESB to propose initiatives to ensure the Post 2025 Package delivers least cost outcomes for consumers

3. ESB to confirm voluntary approaches to consumer participation in wholesale and other markets

4. ESB and market bodies to work with Energy Consumers Australia and consumer groups to embed the values and expectations of consumers in the detail of the market design initiatives

5. ESB to develop a framework for the evolution of energy service providers drawing on contemporary design studies and transition design theory

6. ESB to develop (in consultation with Energy Consumers Australia, consumer groups and other stakeholders) a staged Roadmap based on consumer values, expectations and interests informed by the WA DER Roadmap model that prioritises a flexibility plan as outlined in Annexure 3

7. ESB to identify supporting measures that Governments and other stakeholders can take to support the implementation of the design, unlock flexibility on the demand side and build consumer and community support for implementation of the Roadmap.

In the coming months Energy Consumers Australia will support engagement with the ESB and other stakeholders supporting the work of the ESB to embed the values and expectations of consumers in the detailed design and a framework for intermediaries including through:

- Engaging Dr Cameron Tonkinwise to develop insights on how other sectors are (or are not) designing for social practice and consumer outcomes resulting from digital disruption and other transitions and implications from transition theory for energy market design including subsequently testing the DER Sprint use cases in light of these insights
- Further engaging on the ACIL Allen Supporting Households Framework and how it can be useful to test consumer decision points around proposed services in the new energy system and identify a diversity of consumers and barriers to their full participation in the new energy system. We look forward to this engagement and how it might inform complementary measures and other State based incentive programs to lessen the energy divide
- Collaborating on developing a more-fir for purpose Consumer Protection Framework, building on our recent experience in defending the public benefits of the NETCC before the Tribunal and the ESB's Data Strategy. We are supporting a more principles based approach to consumer protection rather than a prescriptive rules based approach, closer in style to the AER's recent Statement of Expectations and the approach in the NETCC.
- Engaging a range of international speakers, including from the US and the UK, where they can contribute insights and frameworks to the design issues being confronted in Australia.

Annexure 1

Post 2025 two-sided market Working Group Vision, Problem definition, Objectives and Principles

Vision

Option 1: In 2025, energy market arrangements support the most efficient balance of supply and demand resources, enabling consumers to access the energy they need affordably and sustainably while realising the value of their demand and supply where it contributes to the ability of the system to meet end-users' needs.

Option 2: In 2025 energy market arrangements facilitate the most efficient, affordable, reliable and clean balance of energy supply and demand, by supporting consumers to access affordable, clean energy they need and provide opportunity for consumers to safely and easily participate in the market through valuing their energy practices.

Option 3: In 2025, energy market arrangements support the most efficient, affordable, sustainable balance of supply and demand resources for consumers.

Problem definition

UNCERTAINTY: Current and future markets and policy settings, and how people are motivated to respond to these and other incentives, are characterised by increasing uncertainty.

COST: The growth of decentralised sources of supply and demand is contributing to more variability in the energy wholesale market, which is increasing costs on the system that are ultimately borne by consumers.

PARTICIPATION: Consumers shifting load or generation could create value in the wholesale market, ancillary services, emergency services or for network support, but market rules prevent them from realising this value.

CHOICE: Market arrangements, along with those for metering and connection, don't support consumer preferences to access the products and services they want or from the providers they choose (i.e. people can only contract with one retailer, and not with other intermediaries such as aggregators).

ACCESS: New and innovative energy products and services offer significant value but are difficult to access for disengaged and low-income consumers.

PROTECTIONS: New market models, products and services, where they partly or fully facilitate essential energy supply, raise new risks for consumers in emerging markets, particularly disengaged and vulnerable consumers.

Objective of the review

The objective of the 2SM review is to introduce reforms and controls which support a move (at least cost for consumers) to a market with new energy services and opportunities for consumers who want to take advantage of the new capability (including generation or use), either directly or via traders, while protecting the essential service supplied to all other consumers.

Principles

To ensure that energy is an essential service and everyone has the right to access clean, affordable, dependable energy. Any future market design must:

Put people at the centre

- Leave no one behind:
  - All people should have the opportunity to take advantage of new energy services enabled by two-sided market reforms if they want to.
  - People should be able to access affordable, efficiently priced basic energy supply regardless of how much or how little they actively interact with energy services.
  - People should be able to readily obtain any help they need to access an essential energy supply or to interact with energy services.
- Enable energy management technology, products and services that enhance consumer outcomes and reduces the costs of the energy system.
- Be open and transparent, allowing consumers to choose from a range of new products and services that they can engage in directly and/or via energy providers and market intermediaries.
- Information and tools that empower consumers to make decisions must be available, and be clear, transparent, in plain language and accessible (i.e. rather than relying on bills as the primary communications channel, businesses should communicate directly and appropriately with customers according to preferences and in ways that suit the information being communicated).
- Supported by fit for purpose consumer protections, including dispute resolution, to enable full participation.
- Consumers and communities have an ongoing voice and input into the design, evolution and progression through market development to reflect consumer needs and expectations.

Prioritise the long-term and be flexible

- Long-term (2025 and beyond) solutions should be prioritised over short term workarounds. There is inherent uncertainty in transforming complex systems, therefore a staged approach, with scope to adapt along the way, is critical.
- Regulatory frameworks and controls should be fit for purpose, light touch and provide the maximum agency and flexibility for consumers, both individually and in groups or communities. This would favour decentralised bottom up solutions rather than a centralised top down model.

- To deal with changing circumstances and uncertainty, decisions about progressing through reform stages should be guided by a customer centred framework and principles to evaluate consumer needs and preferences, business models, technology, consumer protection frameworks and other material considerations.
- Be flexible and innovative in response to changes in people's needs and preferences, the environment and technology.
- Focus investment on innovation, research and development to develop products and services that meet the diverse needs of people, businesses and communities.

Guarantee just and fair outcomes

- Distribute costs, benefits and risks transparently and fairly to allow for equitable outcomes regardless of people's ability to engage with the energy system.
- Costs should be recovered from:
  - beneficiaries (where costs and beneficiaries can be identified) or
  - causers (where primary beneficiaries are difficult to identify or costs or benefits are difficult to quantify).
- Clearly identify risks of future market arrangements to ensure that risks sit with those best placed to manage and afford them.
- If consumers are going to be exposed to risks, this must be by their own choice, they should be rewarded and they must be empowered to manage and minimise them.
- The designers must be explicit about the limitations of the market solutions and consider the need for complementary measures that may be required to successfully address those limitations.

Ensure it works

- Ensure that investment in, and the operation of the energy system is equitable, economically efficient and avoids wasting money and resources.
- Provide incentives and prioritise energy solutions to manage demand and improve the utilisation and reliability of existing generation and network infrastructure.
- Improve the resilience of people, communities, businesses and institutions as well as the energy system to manage shocks.

Deliver clean and healthy energy

- Support transition to net zero emissions, as well as consumer preferences for clean energy services.
- Support energy services that positively impact the health and wellbeing of people.
- Enables people, businesses and the community to play a role in the transition to a clean and sustainable environment.

Annexure 2

Smart Hot water Case study

This case study was developed for the Working Group to explore the future market from the consumer's point of view, as an illustrative case study to explain interactions of the Post 2025 Market Design Package inside the home.

The case study defined a smart hot water service as a newly installed electric pump hot water unit (in a non PV household) that includes smart control capability that can be controlled externally by a third party to vary the time of heating of the hot water to create value for the customer and the system. The ESB then took this case study and used it to explore the new mechanisms contemplated by the Post 2025 options paper from a practical customer perspective.

The ESB was able to use the case study to illustrate what the MDIs are trying to achieve by reference to interactions in the home. The discussion highlighted the following:

- each of the opportunities for consumers to share in the value that was being unlocked in the case study, depends on a consumer handing management of their smart hot water load to a third party who would then act on their behalf. A key outstanding question for the ESB is who these new energy services providers will be and the terms on which they will interact with customers. It was noted that retailers and to a lesser extent networks have important existing relationships with their customers and they may offer hot water services to customers as the initial highest value use of their flexible hot water load;
- smart hot water can be used to store excess renewable energy at times of low wholesale prices during the day and use renewable energy that may otherwise need to be curtailed;
- if hot water is aggregated and becomes a flexible load at scale then it can help to integrate renewable energy from wind and solar generation;
- a community battery that interacts in the wholesale market could also be set up to heat hot water services for vulnerable customers;
- Governments could shift their subsidies and incentive programs by funding the roll out of smart hot water units to vulnerable cohorts;
- the DER Integration Sprint is looking at peer to peer local trading to enable a consumer to benefit members of their local community;
- if existing load control programs used by networks for grid stability are displaced, networks may need to be incentivised to buy services from a hot water load aggregator rather than augmenting their network;
- over time as consumers became more familiar with the changes and confident that their access to hot water is not adversely impacted, it might be possible for third parties to aggregate hot water services into firm contracts into the market with the opportunity for greater profit and rewards to consumers for being flexible with their hot water load; and
- as more hot water services are being used in the market as a way to balance supply and demand, the Post 2025 design may mean consumers can support aging thermal generation retirement without the need to build extensive replacement generation.

There is ongoing work for the smart hot water case study (and other practical examples) in the next steps that we recommend in this submission including:

- testing smart hot water services with consumer personas as part of the ACIL Allen engagement;
- to inform a discussion on what the supply of smart hot water services will change for consumers with a view to identifying risks to consumers from these new services; and
- identifying how current consumer protections would apply to the supply of smart hot water services.

Annexure 3

A flexibility plan to empower consumers

Why maximising flexible demand should be a priority in the ESB's roadmap[20]

In addition to getting the market design right, ESB, working with Governments, need a practical plan to empower consumers to participate. We are thinking about this in terms of prioritising a flexibility plan.

As thermal generators retire over the next two decades, the generation mix in the NEM will increasingly be dominated by renewable energy. The ESB Consultation Paper's work to develop an ageing thermal generation strategy[21] primarily focusses on system side solutions to the grid management problem caused by the uncertainty of exit timing and does not see flexible demand and DER filling this gap. The ESB's Post 2025 Market Design Review has highlighted that there is now an urgent need to address the affordability, security and reliability challenges arising as the NEM transitions to accommodate lower emissions by 2050 and rapid technological change.

Flexible demand can also deliver a more affordable future energy system that is more distributed and more democratised. Flexible demand will be increasingly important as a low cost means to:

- balance generation and load in a market dominated by variable renewable energy;
- manage expected changes in load; and
- as consumers continue to invest in rooftop solar PV, and in the future in energy storage provide an opportunity to harness the potential of these assets to manage grid stability issues.

Flexible demand can provide a lower cost means to facilitate this transition by limiting the need for investment in expensive, fast response capacity and network infrastructure. Currently, demand is assumed to be fixed and generation is increased or decreased to maintain balance. As variable renewable generation increasingly dominates the generation mix, and as technologies allow load to become more flexible, it makes sense for load to be increasingly relied upon to maintain balance. The alternative would be investing in a significant amount of backup generation, battery storage and network infrastructure, with limited utilisation. Further, flexible demand has the capability to be deployed in small increments as required, in contrast to lumpy fixed assets.

At the same time as the supply side is fundamentally changing, we expect to see ongoing changing patterns of energy consumption which will impact on future investment. This includes:

- a shift towards the electrification of transport and heating;

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[20] This section of our submission draws on material authored by Lynne Gallagher and Elisabeth Ross on flexible demand to be published in 2021 in *Variable Generation, Flexible Demand*. Edited by Fereidoon Sioshansi

[21] MDI B discussed in pages 47-58

- increased demand for heating and cooling Australia's poor housing stock; and
- permanent flexible work patterns post COVID increasing household energy consumption (but not necessarily peak demand).

Managing these changes in energy consumption in a cost effective way will require developing appropriate, easy to understand incentives for consumers to manage their energy consumption in a way that does not adversely impact the grid or lead to investment in underutilised assets.

Partly in response to the rising cost of electricity, consumers have invested significantly in behind-the-meter technology. The ESB has recognised AEMO's concerns that the ongoing widespread adoption of solar PV will continue to create grid and system instability concerns. These concerns have led to calls for curtailment capability of these rooftop generating systems from operating if needed to maintain system security. In the absence of flexible demand, the costs of the additional investment required to reconfigure the NEM around renewable generation and curtailing of PV solar could be much higher and lead to worse affordability.[22]

To date Australia does not have a good track record of cultivating flexible demand, particularly at the household and small business level. While large customers will soon have access to the wholesale price via the wholesale demand response mechanism, either directly or through a third party, households and small businesses are not able to participate. There are some trials currently being conducted that enable small customers to participate in a virtual power plant, but these trials are in very early stages and barriers to the widespread orchestration of small customers' flexible demand remain.

The ESB has a critical role to play in developing the pathway forward to develop flexible demand at scale in the NEM. A core part of developing this part of the ESB Roadmap dealing with flexible demand will be:

1. understanding the barriers to achieving flexible demand at scale;
2. setting out a concrete action plan to remove those barriers and
3. creating a framework that incentivises consumers to easily and conveniently offer demand flexibility into markets and be appropriately rewarded for doing so.

What is flexible demand?

By "flexible demand" we mean any action taken, or consented to, by a customer to change their load profile compared to their usual behaviour, whether by shifting load to a different time period or simply reducing (or increasing) demand.

[22] Energy Consumers Australia recently discussed our preference for alternative approaches to future proofing South Australia's energy system other than curtailment in our submission in response to the Government of South Australia Department for Energy and Mining Consultation on smarter Housing. We favour initiatives that unlock value for all parties, supported by tools, platforms and information for consumers rather than control being taken without consumers knowledge.

Flexible demand includes both load (such as consumption from use of appliances) as well as behind-the-meter generation. Solar PV, batteries or other storage (including smart hot water, and electric vehicles) can be used to change the load profile by shifting generation into self-consumption and into storage thereby reducing exports.[23]

Developing a flexible demand plan within the ESB Roadmap

In order to maximise demand flexibility in its Post 2025 Market Design Package, the ESB needs to develop a strategy and Roadmap that delivers opportunities for greater demand flexibility in a way that consumers find rewarding, without too high a cost in inconvenience. The development of a robust flexibility plan will include several steps including:

- developing a vision for incorporating flexible demand into the NEM,
- conducting a situational analysis of barriers to the implementation of that vision including:
  - examining existing regulatory barriers to enabling flexible demand; and
  - conducting a stocktake of the range of trials in the NEM that are underway, or have been completed, that seek to shift or change customer load and understanding what barriers will prevent implementation of viable concepts and where further trials are required; and
- developing a roadmap of actions describing the elements and stages needed to meet the target over the next decade.

Critically, in examining both the existing trials and possible future trials, explicit consideration must be given to the consumer experience. Removing regulatory barriers is only one piece of the puzzle: consumers must have the incentive and motivation to offer their flexible demand. Given the diversity in consumer preferences and needs, as well as diversity in the range of technologies that a given consumer may be able to access, it is unlikely that a "one size fits all" solution will be available.

The plan should be co-designed with consumers following the Cameron Tonkinwise work on consumer centred design and social practices within the home and work towards a framework that is consistent with consumers' expectations. The plan will need specific actions and action owners (identified clearly across national and state players) and similar progress evaluation criteria to those in the general DER roadmap. Energy Consumers Australia recommends that the flexibility plan start with smart electric hot water and this example is developed further below.

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[23] The WA DER Roadmap (p 24) recognises the potential for flexible load to play a meaningful role in mitigating the challenges encountered in their high-DER future and also to assist customers manage their energy costs. The Roadmap includes a definition of flexible load (p 24) which is limited in that it focuses only on load and does not go as far as including behind the meter generation and storage. The other deficiency with the WA definition is that it highlights the benefits to the system from orchestration of the flexible load but does not refer to the need for customers to be incentivised to respond to the load control or price signals.

Energy Consumers Australia believes that some of the actions in the Roadmap will include:

- changes to policy frameworks to focus on consumer outcome measures including:
  - technology giving consumers greater control rather than controlling them;
  - opportunities being created for consumers that choose to shift their use or generation to be rewarded for doing so other than through time of use or peak pricing tariffs. It is likely that digital technology and smart connected devices will be developed that will be supported by simple pricing plans and increased automation;
  - flexible consumer protection frameworks, such as the NETCC, simplifying how consumers navigate the new energy technology environment;
  - consumers having access to real time data, information and tools to inform their real-time decision making; and
  - a new approach to safety nets and social equity outcomes; and
- designs for the diversity of consumers and how they use energy in their homes and businesses.

Unlocking flexible demand

Essential preconditions to unlocking flexible demand are:

- smart connectivity either through smart meter or smart appliance roll out or cost effective home energy storage options;
- information and tools to enable customers to understand their use;
- smart pricing, rewards or incentives which rewards the customer for changing their use or generation;
- frameworks to encourage products and services built on customers' desire for control and limited capacity or interest in engaging with energy; and
- the emergence of trusted energy service providers to assist customers to make choices that benefit them as well as the system as a whole.

This last point is critical. The majority of consumers will not want to manage their own energy usage. This means that energy service providers must have an incentive to offer flexible demand flexibility to consumers in a way that meets consumers' needs, and consumers must have an incentive to take up those offers. This includes being able to trust that the appliances that consumers rely on to provide home comfort, entertainment and transport will be available when they need them.

The role of energy service providers in flexible demand services

New energy service providers[24] will have an important role to play in extracting the value of demand flexibility, and the role of these service providers must be explicitly considered in the current DER design sprint and wider Post 2025 redesign. Of course consumers already have relationships

[24] The ESB uses the term 'third party providers or the term' intermediaries/aggregators' in the 2SM MDI section of the Consultation Paper. We consider that 'intermediaries' implies a lack of value adding and a business that is simply passing through costs without really taking responsibility for customer outcomes. For this reason, we use the term 'energy service providers', which can include existing retailers and network businesses and other new entrants.

with their retailers and in the case of load control with their network through specific tariffs and as part of network demand response programs[25]. It will be critical for the ESB to look at the barriers to retailers offering demand flexibility as a service as well as removing barriers (including access to and management of data) to the emergence of new third party aggregators, who may offer innovative products and services to customers, leading to greater competition in the retail market.

The NEM is characterised by a few large integrated gentailers that between them control a significant share of generation and retail markets. This integration has led to a conflict of interest where gentailers have little incentive to use flexible demand to hedge against wholesale spot price risk, which in turn has led to very little innovation in flexible demand services from the major retailers. [26] Third party serve providers such as demand aggregators have different incentives to the integrated gentailers – their core business is to identify the value of the demand flexibility and maximise that value across multiple markets on behalf of customers through the use of specialist technology and skills. They can also offer flexibility services independently of a retail product.

Networks and consumers have made an investment to date to support their network-led flexible demand programs, which has led to avoided augmentation expenditure. As regulated networks are currently limited to providing network services they will not be able to unlock additional value streams that a single asset such as hot water storage could provide in other markets. If customers shift from load control and acquire the services of demand aggregators, networks should be incentivised to contract directly with these service providers to acquire contracted flexible demand services in place of building network solutions to replace the lost demand response. As network businesses will need to play an important role in the context of the greater penetration and coordination of DER, barriers to this participation will need to be removed and facilitating access to and exchange of data between network businesses and third party energy service providers will be critical.

If, as we recommend, the ESB does a systematic review of the barriers to entry by new energy service providers offering flexible demand services, the ESB will be able to develop a Roadmap with a series of actions and milestones to both lower those barriers to entry as well as creating a framework to facilitate entry of new innovative demand aggregators.[27]

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[25] For example Energex economy tariffs 31 and 33 and SAPN's new Time of Use Solar sponge tariff

[26] There are examples of emerging innovative service providers to households including Amber Electric, Energy Locals and Pooled Energy and VPP style offerings for customers with batteries. Flow Power and ERM Power are also exploring demand response opportunities for small businesses.

[27] Energy service providers will play a critical role in the future of DER integration and the development of the new energy system. The ESB Consultation Paper is surprisingly silent on who these providers will be and the frameworks needed to support their entry into the market. Given the importance of this issue, Energy Consumers Australia has commissioned CutlerMerz to give advice on issues from a customer's perspective associated with third parties accessing and controlling customer's DER assets (including generation, storage and demand response assets). Some of the issues within the scope of this advice include: Who gets to control behind the meter assets and for what purpose? What choice should the customer be given and how

The threat of competition from new entrants may also be sufficient to stimulate a competitive response from these gentailers.

Motivating consumers to offer flexible demand, including by building trust

Consumers have demonstrated in research and in the limited opportunities available to them, that they have the ability and willingness to change their demand (both consumption and generation), provided it suits them. To date the predominant lens through which the transition has been viewed by the ESB has been the energy system and the need for system security and reliability. As Energy Consumers Australia and other advocates have been stressing, the ESB needs to reframe the issues and challenges facing the NEM to focus on the consumer perspective. Consumers must be rewarded and incentivised to provide flexibility in their consumption and generation in a way that they understand and can respond to. This requires more than standard financial incentives and price signals. Rather a deeper understanding of what drives customer decision-making, including their diverse values, goals and expectations for the future is needed to inform the development of the plan and Roadmap.

As mentioned above, access to smart meters, smart pricing and smart connected appliances are only some of the preconditions needed to unlock flexible demand. Building trust will be needed so that consumers will gradually choose to make small changes in how they use and generate energy whilst ceding control in stages to a third party to enable them to aggregate the small loads in exchange for value.

Smart hot water and the flexibility plan

One of the reasons why we recommend smart hot water being developed as the first flexible load in the flexibility plan is that it is a low cost energy storage device that needs to be replaced on average once a decade in every house and customers are already used to separating their consumption of hot water from the time it is heated due to off peak tariff arrangements. This means that it is an ideal candidate on which to build consumers trust around new services, new energy service providers and the protection frameworks as the flexible demand services market evolves. At the same time policy makers will be able to communicate with customers about how minimal and convenient changes in their behaviour can reward them through more affordable power and benefit the system by integrating variable generation by using smart hot water units as low cost storage.

The authors of the flexibility plan will need to develop a vision for hot water and analyse the cost benefit analysis of including the retrofitting of part or all of existing hot water units and/or subsidising the roll out of new smart units[28].

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should customer choice be enabled/disabled depending on the need/urgency for control? How should equity implications for the various mechanisms be taken into consideration and what are the issues/gaps in the current regulatory framework that are resulting in sub-optimal outcomes for customers?

[28] An example of a current retrofit program is in Hawaii which is using smart connected devices with smart pricing to aggregate hot water load, as a virtual power plant https://www.globenewswire.com/news-

A comprehensive situational analysis should inform the barriers to creating a smart hot water services market including a stocktake of:

- current load control arrangements (e.g. the Ripple control programs in Queensland and NSW; the smart meter load control programs in NSW and the recent smart tariff arrangements in South Australia);
- regulatory barriers to the implementation of smart hot water units (including the acceleration of a common, open standard discussed below); and
- existing trials and projects with emphasis on possible barriers to the widespread adoption of beneficial project outcomes including both local projects (for example the ARENA RACV smart hot water system project[29]) and overseas projects (the Pacific Northwest transformation project discussed above).

The ACIL Allen framework will assist the architects of the flexibility plan to identify situations where some consumers will not be able to participate in a market for smart hot water services. Targeted government initiatives could be developed to meet this gap including subsidising targeted roll out to deliver practical outcomes for household and small businesses[30].

The role of standards in flexible demand

Some steps have already been taken to identify regulatory barriers to the development of a flexibility plan. There is increasing evidence, both locally and internationally, that the development of open common standards will be critical to the successful development of flexible demand in a way that maximises consumer agency and minimises consumer inconvenience. We are also concerned that the approach to development of standards in Australia is slow and that opportunities for Australia to harmonise standards in DER with standards in place in other jurisdictions should be maximised to reduce local and global market fragmentation.[31]

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[29] https://arena.gov.au/projects/smart-hot-water-system/

[30] As we noted in our recent submission to the South Australian smarter home consultation: "*A good example of this would be to retrofit hot water systems in social housing with devices that automate the shifting of hot water load to more appropriate times. In this example, the automation removes the reliance on individuals to change their behaviour on a daily basis. Instead, consumers can "set and forget" and receive the benefits of the new tariffs all while supporting the broader community effort to strengthen the energy system. This initiative could be extended to include private rental properties, with the Department offering an incentive (such as a rebate) to private landlords to retrofit hot water systems in their properties.*"

[31] The WA DER Roadmap makes a similar observation at page 25 about the development of recent updates to the Australian Standard (AS/NZS 5139:2019) that applies to installation of behind the meter battery storage. The Task Force expresses concern that the final Standard could increase costs and delay uptake rates. They note that the Standard includes additional requirements such as non-combustible materials for installation on walls as well as limits on the proximity to windows, ventilation, hot water systems, air conditioning units or other appliances. The standard places a higher requirement than the international standard (IEC 62619) which applies in Europe, and some major manufacturers have argued that the standard is too strict compared to other jurisdictions where batteries that meet IEC 62619 are deemed sufficiently safe to be installed inside houses.

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