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Future regulation of the electricity sector

When accepting this invitation, I was asked to reflect on what market design do we require for 2040 and beyond, as well as what should we be building towards and why?

At Energy Consumers Australia we play a unique role, which is to frame all that we think, say and do from the perspective of consumers. Specifically, we address the long-term interests of 10 million households and 2.6 million small and medium businesses, in the energy system.

There are countless numbers of dedicated policy makers, engineers, economists and people in industry working to ensure that the power system safely and reliably delivers electricity, today and tomorrow.

My Catholic mother would say this is God's work and she would be right.

What is yet to receive the same attention is a plan for reshaping demand so that we have a least cost electricity system as well as one in which the energy bills of households and small businesses are affordable. A plan that reflects the role we are asking consumers to play and creates opportunity for all households and small businesses, rather than deepening inequity.

The market structure we are working towards is a system where Consumer Energy Resources (CER) – that is the assets in people's homes and businesses that use, generate and store electricity and how they are used – are core.

Reshaping demand means consumers changing long established social practices, building new norms for using electricity when it is abundant and at times being adaptive and responsive to match a fluctuating electricity supply.

But this has not been done before. It is new. We can't lay it out in exquisite and prescriptive detail now. We need to invent it.

Given the uncertainty in how we get to the destination, questions of market design are as much about making sure we are geared up for what is going to be a difficult journey as it is about debating the merits of design features.

I don't mean to appear as if I discount the complexity of rebuilding the system and creating new markets to accommodate large-scale renewables and at the same time maintain system security.

But the CER challenge is qualitatively different because of the humans involved and their diverse motivations, abilities and opportunities for participation - that may or may not align with system interests.

Market design needs to get its hands dirty by engaging with this 'messiness'. In our design thinking we need to anticipate and support business models that create authentic value propositions for consumers, that are simple to understand, easy to action and where consumers have agency.

Consumers are on largely on board with a renewable future, but big roadblocks lie ahead to participation and unlocking the flexibility in demand that we need, if we are to achieve a future electricity system at least cost.

The road ahead

The Chinese proverb tells us that a journey of a thousand miles starts with a single step.

Recently the Climate and Energy Minister, Chris Bowen told us that there are only eight years – or 90 months – in which to achieve the Government's 2030 target for reducing emissions economy wide.

The first step that the Government sees as vital is implementing an integrated national plan which covers all the investments needed to move to a renewable economy.¹ The agreement of all Energy Ministers to work on this *National Energy Transformation Partnership*, signals a new era of cooperation in the shared project that is the transformation of the electricity grid.

Yet at the same time this national plan needs to give households and small businesses hope that the renewable energy system of the future will meet their aspirations.

Our research shows strong support for urgent action towards a renewable energy future, though parts of the community remain to be persuaded.

While 30% of people in our recent Energy Consumer Sentiment Survey, either believe it is impossible (23%) or there is no need (7%) to transition to renewable energy system, more people support a swift transition to happen by 2030 to avoid the catastrophic consequences of climate change.²

However, it is also vital that the national plan needs to go further to assure the community that in the future electricity will be affordable and abundant, as well as clean. They don't expect to trade these things off against each other; they expect all three.

The energy system is failing

Retail electricity prices have been high for most of the past decade, averaging 30 cents a kilowatt hour (after adjusting for inflation). Our analysis suggests that they are likely to remain at that level (in real terms) for the remainder of the decade.

This is because future falls in wholesale prices resulting from more renewable generation are going to be offset by rising network costs.

Recently, households and small businesses have seen double digit price increases in electricity and gas and given the persistence of stratospheric wholesale prices, more increases could follow.

This is further burdening households who are facing pressures from rising food and petrol prices and increases in housing costs and rents. Small businesses are also feeling the strain.

Our survey data shows that half of all households are paying between 2-3% of their household income on electricity, while the remaining half are paying between 3-12%.

This energy divide is stark.

¹ Hon Chris Bowen MP, Speech to the National Press Club, 29 June 2022, <https://www.minister.industry.gov.au/ministers/bowen/speeches/address-national-press-club>

² Our results are similar to those findings of the Climate Compass undertaken by the Sunrise Project – where 30% of people were disengaged, dismissive or doubtful concerning climate change.

Not surprisingly Australians right now are deeply pessimistic about energy.

Almost all of the people we surveyed are concerned that energy will become unaffordable for themselves in the next three years (88%) and also worry that it will be unaffordable for others (95%).

They also concerned that the system won't be resilient enough to prevent future blackouts and outages (90%).

The verdict is clear. What people have seen in recent months is not just the energy market failing; they have seen it failing *them*.

Trust remains low, with only 4 in 10 saying in our survey that the energy market is working in their interests, rather than participants self-interest.

Why does this matter? When consumers lose trust in the energy market, they are inclined to disengage from it. If we are going to have a successful energy transition, we need all consumers to play an active and constructive part.

People power

Minister Bowen has made clear his view that the “transformation is about more than transmission.”

Within the Integrated System Plan (ISP) there are assumptions made about the role of flexible storage in a renewable energy system – much of it in small scale in homes and businesses. In the ISP the 31 GW of flexible generation in homes and businesses will be almost twice as big as pumped-hydro and utility-scale batteries.³

And this is reinforced in a recent ARENA study on flexible demand⁴ where the cost savings to the system and consumers were estimated to be as great as \$18 billion (NPV).

And yet in assuming we can tap into this “people power” we haven't taken consumers into our confidence about what a renewable energy system means for them – in how they might need to adapt their use of electricity in their homes and in their businesses, or their reliance on grid-supplied electricity.

Our current approach to market design assumes that all consumers can be co-opted into participating, with a mix of controls over their assets and pricing that punishes the “wrong choices” without being given the “Why?”.

Consumers do not understand that the system is physically constrained in its ability to handle renewable energy (particularly the energy they are generating themselves).

³ ISP page 10 <https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en>. “By 2050, the ISP modelling recognises that VPPs, vehicle-to-grid (V2G) services and other emerging technologies will provide approximately 31 GW of dispatchable storage capacity, and utility-scale battery and pumped hydro storage 16 GW (see Figure 1). This balance of grid- and household-connected storage solutions reinforces the need for close collaboration between AEMO, network service providers (NSPs) and investors to ensure investments are synchronised to optimise benefits for consumers.”

⁴ ARENA, Load Flexibility Study, April 2022. The technical summary for this study can be found here: <https://arena.gov.au/assets/2022/02/load-flexibility-study-technical-summary.pdf>

Nor do they know that in substituting sun, wind and water for fossil fuel generation, the availability of electricity will be largely weather driven and reflect limits on storage.

The way consumers live their lives and run their businesses does not necessarily lend itself to managing their energy use flexibly. We need new business models and service providers to square the circle ... but even under optimistic scenarios this is going to take time, possibly decades.

Further, not all households and small businesses have the same means and opportunity to participate in “people power”.

Those with efficient homes, solar on their roof and a battery and electric vehicle in the garage have more choices in how they meet their energy needs and interact with the system.

Those who rent – around one third of all Australians households and most small businesses – and those who live and work in shared buildings have fewer options and are likely to continue to experience the highest electricity costs.

Australians pride ourselves on a fair go, and the energy divide must be addressed in the transition to a renewable energy system – not by handouts but by building equity and inclusion into market design.

We have a choice to make about which path we take in designing the system to better reshape demand to match available generation – including people’s own generation from their roof.

It’s a choice between treating consumers as conscripts - most likely unwilling - or giving consumers the means and opportunity to be willing heroes.⁵ In a recent paper with my co-authors, we described heroes as those with the potential to be “responsive and responsible managers of their energy use and energy resources to benefit themselves and others.”

The wrong path

We have started down the wrong path, by setting up a dichotomy between consumer interests and the system’s interests.

The market designers often say that they want consumers to have choice and control, but then exceptions are made.

One exception is the capability to ultimately, remotely control or set limits on all electrical devices and technologies in the home (or business premise), including rooftop solar systems, on-site batteries, and electric vehicles.

This capability has begun to be deployed at critical times of stress on the system, largely in advance of evolving markets and the new business models that will engage directly with consumers and support and reward them for changing their behaviour.

Even under optimistic scenarios, we are in a transitional period, possibly a decade long, where we will switch-off instead of reward, in dealing with system constraints.

This means we are treating consumers as conscripts rather than volunteers ... but how far can the conscript army take us and will they still be there when we ask them to volunteer?

⁵ Paul De Martini, Lynne Gallagher, Erik Takayesu, Ryan Hanley, Pierre Henneaux: *Unlocking Consumer DER Potential: Consumer-Centric Approaches for Grid Services*, <https://ieeexplore.ieee.org/document/9804185>

Consumers who want to participate in the market to offer up their flexible demand as an alternative to being switched off, face frankly bewildering levels of complexity that we seem to be unable to address as a top-level consideration in our approach to market design.

For example, we have linked the installation of digital meters to mandatory or default time of use charging for the network costs, with consumers usually completely in the dark as to how to adapt their behaviour when these are passed through into their retail plan.

I defy anyone to explain how to respond to a monthly maximum demand charge. Or to explain how kilowatts or amps could or should feature in people's day to day lives.

I once asked a room full of economists – who supported cost reflective tariffs - if they would take a monthly maximum demand charge home to their family, and there were no takers. I had reached the same conclusion after admittedly being one of the architects of that tariff.

The \$18 billion question is whether the design initiatives in ESB's CER Implementation Plan - i.e., flexible trading relationships, interoperability, Dynamic Operating Envelopes, data, metering amongst others – can create our volunteer army? Will the reforms together create a new, more attractive, and simpler market for consumers to confidently try new ways to reshape their demand with a high chance of reward?

We cannot answer this challenge unless we break away from our traditional approach to market design for CER which has been as fragmented as it is incremental.

One by one, process by process, we design standards, rules and regulations with the intention to stop or stimulate consumers into action. The result is that we have multiple and competing "signals" for "do's" and "don't".

Here are a few examples.

We have limits in connection agreements on what people can consume or generate, with the latest being flexible export limits. We now intend that those limits are ones that consumers will bump up against – if for example they should choose to use multiple appliances or charge their electric vehicle at the same time.

We also have rules for when the system can override people's use of their assets, in "emergency" circumstances that consumers have no awareness of, while at the same time not allowing an override by them.

Our regulation of default network charging results in time varying retail pricing that rarely rewards them for off-peak use and charges most of their use at peak rates and adds insult to injury with high and rising fixed charges.

The root causes of this poor market design is the lack of a holistic approach, working back from the plug to power system. And that the design is most often by those in the system, for the system. It is disconnected from consumers.

Put another way in our market design we are treating consumers as "objects" and not as "subjects".

Go back to the drawing board and start with the consumer

We need to go back to the drawing board. To begin by framing each and every system problem from an understanding of consumers, and the barriers and constraints that they face. Only then, with this knowledge can solutions begin to be shaped, tested and refined.

Our current regulatory frameworks are not fit for purpose to support the active and constructive part that we are counting on consumers to play, in managing their energy use and generation to benefit themselves and the system.

The range of intermediaries or service providers that consumers are interacting with are extending far beyond the purchasing of electricity or gas through a licenced retailer.

We have load and generation aggregators emerging, for those with sophisticated technologies. But we should also recognise that there are other “purchasing” decisions that impact energy costs..... including the efficiency rating of the house or business premises that people buy or rent, the technology that they have in their homes or businesses and in the future the car that they drive, and the terms on which vendor financing and credit are provided for these purchases all have consequential impacts.

What could possibly go wrong, you might ask?

Rather than shy away from the interdependencies of these decisions, we need to lift and broaden our approach in our regulatory frameworks.

We need to invest in consumer **agency**. Consumers should have the capability to make the decisions that benefit them when accessing energy services. Information, tools and advice to support good consumer decision making has been lacking and left to the sellers of services.

Given that electricity is essential we need to consider how we apply vertical and horizontal **equity** in market design, something energy economists tend not to consider but for example is enshrined in both taxation law and health policy.

The current market design imposes risks on consumers that they can't avoid or mitigate, which means we need to consider whether a duty of care is needed in our **consumer protection frameworks**. Our protection frameworks need to keep pace with the way in which energy will be bought rather than how it has traditionally been sold. This means replacing the current narrow framework, one which focuses on consumers simply buying energy from their retailer, with a robust and comprehensive framework for protections and rights for consumers of both traditional and new energy services.

Just as we support consideration of a universal duty of care, there should also be universal access to free and **independent dispute resolution** however energy is bought.

Changing our approach to regulation must go hand in glove with the need for government policies to support investment in the critical infrastructure that is needed for more adaptive and responsive demand. This includes bringing almost all of our existing homes up to a better efficiency standard; ubiquitous local storage; electric vehicle charging infrastructure, in all settings; and open access to data to support new energy services and innovation in business models which requires digital meters in every premise within the next decade.

A new energy grand bargain

To sum up, our approach to market design needs to change in fundamental ways. The system itself will be radically different by the end of this decade, which is only 90 months way.

The task might seem confronting or daunting.

But we do consumers a disservice, if those who have the power to create a future energy system that delivers electricity that is affordable and keeps the power on, do not commit to being bold in the face of their uncertainties.

To go back to the Chinese proverb, about starting with a single step. It can mean get cracking, but it also has another meaning. And that is great things start with small beginnings.

And so that is the meaning I want to leave with you today. There is an opportunity to take that first step to bring consumers into the national plan, to enter into a new grand bargain with them about what they need to support their participation and a better energy future.