

Industry Engagement: Energy Market Transition

CitiPower, Powercor and United Energy Stakeholder Workshop (23/09/2020)

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Background, Research Objectives and Methodology

Industry Engagement Background

CitiPower, Powercor and United Energy's activities over the past two years have demonstrated that their customers want to connect and export their excess solar into the network. They are choosing exports to lower their bills, have greater energy independence and build a sustainable future.

CitiPower, Powercor and United Energy recognise that it is increasingly unrealistic to constrain solar and the choices it enables.

In response, CitiPower, Powercor and United Energy commissioned Forethought to facilitate Stakeholder Engagement Workshops to collect feedback and holistic industry thinking on how best to transition the energy market.

The networks were interested in the industry expectations of the role that networks should play beyond distributing energy. These discussions were the basis for the revised regulatory proposal that included aspects relating to the digital network, solar enablement and associated tariffs.

On the 23rd of September, 2020, 25 stakeholders participated in these online workshops that included representatives from energy regulators, government, industry bodies, peak bodies and charities.

Challenge and Objectives

Business Challenge

- Submit a regulatory reset proposal to the AER that best reflects the interests of the key industry stakeholders of CitiPower, Powercor and United Energy.

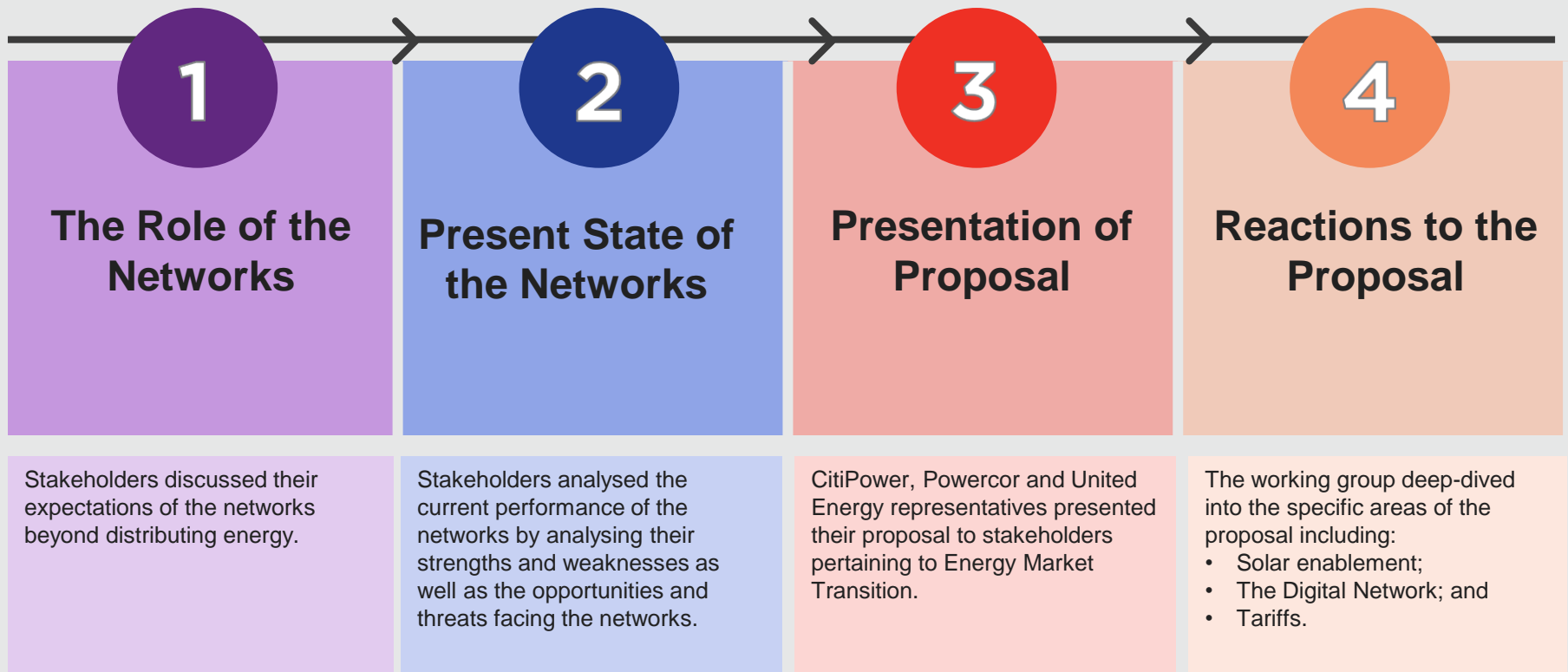


Research Objectives

- Present the solar and digital component of the regulatory reset proposal to industry stakeholders;
- Understand and contextualise industry stakeholder perceptions of the role of the networks in the energy supply chain;
- Understand and contextualise CitiPower, Powercor and United Energy stakeholder perceptions of the proposal with regards to:
 - Solar enablement;
 - Digital Network; and
 - Tariffs.

Workshop Design

The online workshop design comprised of four key areas, where stakeholders were navigated from Townhall to Breakout Groups to ensure all had the opportunity for their thoughts and feedback to be heard as part of the discussion.





The Role of the Networks

In breakout rooms, groups discussed their expectations of the role that CitiPower, Powercor and United Energy should play in the energy supply chain...

The conversation largely hinged on the power dynamic that existed between customers and the networks.

The key question being: *should distributors actively encourage customers to engage in electricity supply to benefit themselves and others, or should distributors be a passive facilitator of customer choices?*



Activity 1:
What role should CitiPower, Powercor and United Energy play beyond supplying energy to businesses and consumers?

Stakeholders expected the networks to take on three main roles beyond distributing energy to consumers*...

In order to manage uncertainty, reduce impact on the grid and deliver fair and efficient outcomes, stakeholders expected CitiPower, Powercor and United Energy to be an...



Enabler

Empowering and supporting customers to take actions in line with their preferences and values.



Advisor

Communicating deeply and frequently with customers to help make mutually beneficial decisions.



Innovator

Providing products and services that increase productivity and efficiency whilst enabling a better energy future.

Enabler

Empowering and supporting customers to take actions in line with their preferences and values.

Stakeholders expected networks to continue delivering in their **ongoing operational capacities** pertaining to asset and vegetation management and responding to outages. These were expected to be continually conducted with efficiency and **safety** as a top priority.

Into the future, stakeholders expected the networks to be **an enabler of customer choices**. This included providing technologies and behavioural interventions that enabled customers to make the decisions relating to their energy supply and consumption that were in line with their values. This included a greater ability of customers to uptake solar PV and storage by better facilitating exports from personal systems.

Regardless of how active or passive customers were with their energy, it was expected that the networks would be *supportive* of customers and provide flexibility of options regardless of their level of engagement.

“Networks should be facilitating exports from the systems so that they can get the most out of their personal investment out of DER.”

Workshop Stakeholder

Advisor

Communicating deeply and frequently with customers to help make mutually beneficial decisions.

Stakeholders saw **education and communication with customers as a key role in helping enable choices** about the future of the networks and the future of energy. Instead of simply supplying energy, distributors were expected to provide the service of providing information and tools to consumers.

Part of this process included **increasing the visibility** of the networks in the energy supply chain (whether through retailers or other means) to educate, collaborate with and advise consumers on key issues.

Key themes that stakeholders wanted the networks to engage and advise customers on were:

- Engaging with customers about what they **value from the network**;
- Providing information to customers as to **how their actions impact network** and end costs; and
- Engaging with customers about what the **future of the network** should look like.

“They should be helping consumers make better use of the network by advising consumers on safety issues, economic use, appliances, solar and battery.”

Workshop Stakeholder

Innovator

Providing products and services that increase productivity and efficiency whilst enabling a better energy future.

Many stakeholders believed that networks had a role in **being a thought leader** to realise a successful transition of the energy market.

Stakeholders saw the three networks as being flexible and innovative enough to **commercialise existing technologies and create new technologies** to help decentralise power supply and ensure that the grid is more resilient into the future.

Some specific technologies and innovations that were referenced were:

- Smart-meter technologies;
- Peer to peer trading;
- Virtual power plants;
- Microgrids, and
- Standalone power systems.

“[Networks should be] innovating and bringing technologies to commercialisation and activation in line with what people are looking to get out of their networks.”

Workshop Stakeholder

Activity 1:
What role should CitiPower, Powercor and United Energy play beyond supplying energy to businesses and consumers?



SWOT Analysis of Distributors in The Energy Market Transition

SWOT Analysis Overview

Strengths

- Abundance of data and analytics capabilities
- Established, monopolistic position leading to strong reputation
- Strong industry relationships as a source of knowledge

Weaknesses

- Over-regulation limiting organisational flexibility
- Susceptibility to political disruption
- Limited stakeholder and customer engagement
- Inconsistencies across networks

Opportunities

- Customer engagement as a vehicle for service delivery improvement and network demand management
- Within and cross industry collaboration for increased knowledge
- Availability of smart city and meter data
- Technological and operational innovation

Threats

- Inability to act due to over-regulation and non-competitive organisational structure, increasing:
 - Susceptibility to market disruption due to free-market players and technological innovation
 - Uncertainty associated with political variation
- Environmental forces such as COVID-19 and climate change

Strengths

Key distributor strengths included:

- An abundance of data and strong analytics capabilities
 - Access to meter data across the distribution networks meant a wealth of data was available
 - Distributors were known for having access to strong data analytics capabilities, with a history of improvement enabled and evidenced by outage data
- An established, monopolistic position leading to strong reputation
 - Having sole and unquestioned control over infrastructure, ensured relevance of distributors
 - Being an incumbent monopoly created a 'practiced' reputation based on experience
- Having strong industry relationships as a source of knowledge
 - Industry relationships existed between distributors both domestically and internationally such that they could learn from one another
 - The non-competitive nature of the three Victorian distributors meant there was enhanced collaboration and coordination leading to operational efficiencies

Weaknesses

Key distributor weaknesses included:

- Over-regulation limiting organisational flexibility
 - Seen to inhibit adaptability of distributors and create confusion where multiple sources of regulation were concerned
- Susceptibility to political disruption
 - There were multiple points of governance regulating distributors with conflicting / competing objectives and agendas
- Limited stakeholder and customer engagement
 - Organisational focus was largely operational as opposed to customer and so capabilities in this space were seen to be out of date
 - Lack of engagement meant that customers had limited knowledge and understanding, limiting distributor ability to influence behavioural change and mitigate demand outcomes
- Inconsistencies across networks
 - Inconsistencies in reliability and performance existed between rural and metro networks
 - Older and newer parts of the networks were described as 'incompatible'

Opportunities

Key opportunities for distributors included:

- Customer engagement as a vehicle for service delivery improvement and network demand management
 - Increased customer engagement would lead to better understanding of end-user needs enabling service delivery augmentation
 - Engagement would also provide a platform for customer behavioural change, enabling long-term reduction in network demand
- Within and cross industry collaboration for increased knowledge
 - Collaboration and knowledge sharing with other networks, industrial and academic partners may inform strategy development; improving network stability
- Availability of smart city and meter data
 - Smart meters presented an ongoing opportunity to leverage strong analytics capabilities and a wealth of usage data to inform strategy development
- Technological and operational innovation
 - Harnessing technological and operational changes such as the move from macro to micro grids may improve management per network with decentralisation, leading to positive operational outcomes

Threats

Key threats to distributors included:

- Inability to act due to over-regulation and non-competitive organisational structure
 - Leading to increased susceptibility to market disruption due to competitive orientated organisations and technological innovations
 - Access to opportunities which resided in the competitive space were also restricted due to regulation and 'ring-fencing'
 - Close alignment to Government entities meant increased political uncertainty from potential changes in Government parties, objectives and agenda
- Environmental forces such as COVID-19 and climate change
 - COVID-19 had already impacted network demand
 - An increase in extreme weather event frequency was predicted with climate change, impacting network operations and reliability



Reactions to the proposal



Solar Enablement

After presenting the proposal to customers, stakeholders were asked if pursuing affordability ahead of economic benefit was an appropriate objective with respect to DER integration...

Stakeholders saw **pursuing affordability as an important objective but disagreed on the trade-offs required to achieve affordable energy.**

Many did not see affordability and economic benefit to be a trade-off and instead saw economic benefit to be inherent flow-on value, which should therefore not be de-prioritised.

The assessment was seen to need to incorporate reliability, emissions and affordability as integration was seen to be a better frame than trade-off.

Many stakeholders **did not give a clear response to this prompt** and instead questioned the modelling.

Some believed that the model should have already included affordability and others argued that affordability would be an outcome of efficiency.

“Affordability is an important consideration but there’s not a clear distinction between economic benefit as that effects the wholesale market.”

Workshop Stakeholder

“In any case, an economic model that doesn’t consider affordability is flawed. People have to be able to afford the electricity.”

Workshop Stakeholder

... and what they considered an acceptable level of network performance for solar if affordability is an issue.

The acceptable level of network performance for solar if affordable is an issue was seen to be **dependent on the part of the network in question**. Given the different performance of the respective CitiPower, Powercor and United Energy networks, there were different expectations for each network.

Despite this, stakeholders agreed that the most constrained parts of the network should be a priority, and largely prioritised the most constrained parts of the network to focus attention.

It was also argued that priority should be given to accessing solar over guaranteeing that there would not be constraints.

Many also referenced the fact that due to higher levels of residential demand with Victorians working from home, networks should be cognisant that performance needs will increase as **consumers expect that solar PV will work more efficiently**.

With this being said, **effective communication with customers was seen to be of high importance** to ensure expectations are set and customers can manage their load to reduce the impact on the grid.

“This is dependent on the part of the network that we’re talking about.”

Workshop Stakeholder



The Digital Network

After presentation of the proposal, stakeholders were asked about the benefits of the Digital Network Program presented...

Stakeholders were **generally pleased** about the Digital Network program presented however there were some questions about the proposal and its implementation over then next period.

Most prominently, stakeholders were interested to know **how the Digital Network Program would link with other assets and infrastructure in the grid** as they are created in isolation to each other. Stakeholders wanted to ensure that the Digital Network gave consumers flexibility without creating stranded assets in the long-term.

There was also some concern that there may not be large benefit to the Digital Program as there is not a large penetration of PV in Victoria and it **may not deliver economic benefit**.

“There’s uncertainty for all things into the future. How do we link everything together to give flexibility or else consumers will be exposed to stranded assets.”

Workshop Stakeholder



Tariff Options

Reactions to tariff options were mixed....

“Communications is front, centre critical; get that wrong then whatever you do is a waste of time.”

Workshop Stakeholder

While there was support for the new tariff options, being seen as straight forward and equitable by some, there were concerns raised by others.

The current time of use tariff design was considered the slowest path to tariff reform and a missed opportunity.

Interest rates were considered to be at a once-in-a-generation low point, with opportunity to design a time of use tariff with minimal price increases.

Current analysis was seen to assume normal distribution of economic stress, where an abnormal distribution was more realistic.

Concerns were voiced regarding low-income households having to regiment energy use according to ‘odd hours’ due to the time of use premium. A tariff model akin to that of the water corporation in Durban, South Africa was suggested, where premiums were placed on usage beyond a certain point considered efficient.

Understanding who was going to be most impacted was raised as part of a larger consideration regarding the pathway and associated communications in transitioning to new time of use tariff model. Communications were important; ensuring customers understood changes and what they meant from a bills perspective; impacting long-term support and success.

External factors also needed to be considered when assessing the success of the current tariff reform. Example was given in the availability of workplace charging for electronic vehicles; the absence of which would define when electronic vehicles were charged, regardless of time of day tariffs.

...and stakeholders were undecided on DER rule change initiatives

“Recognising the impact on those customers that have virtually no capacity to adjust is critically important.”
Workshop Stakeholder

The majority of stakeholders did not take a position on whether rule changes were positive or negative.

Stakeholders felt DER initiatives should hold a community focus, prioritising facilitation of community level changes over individual. This was driven by demographic observations, such as proportion of renters to owners, the former with no capacity to respond to DER initiatives

Another guiding principal held was that generators or large exporters should not have to pay as this was seen as one of the founding tenants of the electricity market

It was also suggested that while the idea of charging for economically valuable service made sense, the idea of a minimum guaranteed level of export for all may be more politically realistic.

Stakeholders mentioned that they would be keen to see networks buy services from the owners and rules which encourage efficient investment.

Appendix:

Proposal presented to stakeholders

Proposal for discussion

Background

Customers want affordability, reliability, security and the ability to use DER. To achieve these aims, we're seeking the right balance between:

Preparing the network to accommodate more DER

VS

Allow customers more flexibility in managing their consumption and electricity bills

VS

Restricting DER (lower bills or less opportunities and higher bills?)

Our original proposal included solar enablement and digital network initiatives, focussed on:

- Preparing the network to enable the efficient level of solar i.e. unlocking solar when the benefits to all customers exceeded the costs
- Developing the ability to allow customers to use electricity more flexibly to manage their own electricity bills and reduce the requirement for further network augmentation
- Get more out of our existing assets by better managing distributed energy resources

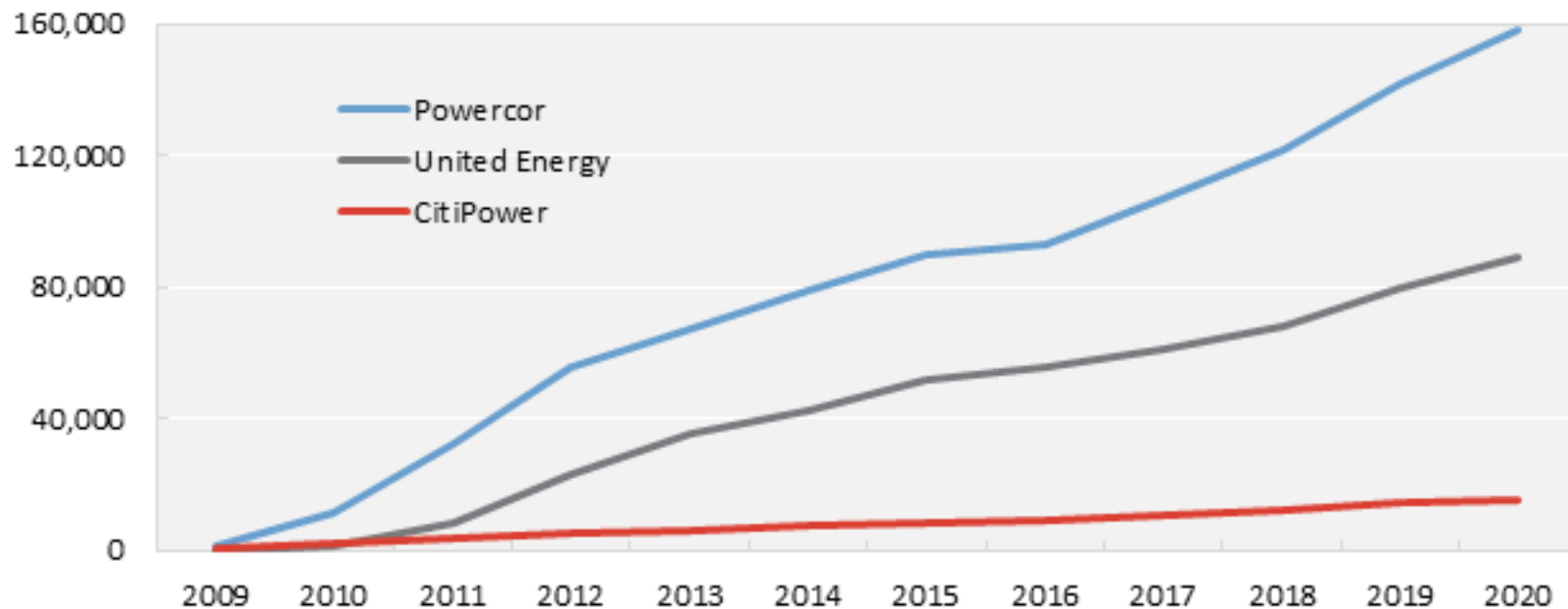
These programs were designed to help us transition the network to a future our customers have told us they wanted.

Since our proposal we've continued the conversation and particularly in this highly uncertain environment and stakeholder feedback, we are revisiting whether we got the balance right.

Solar continues to grow

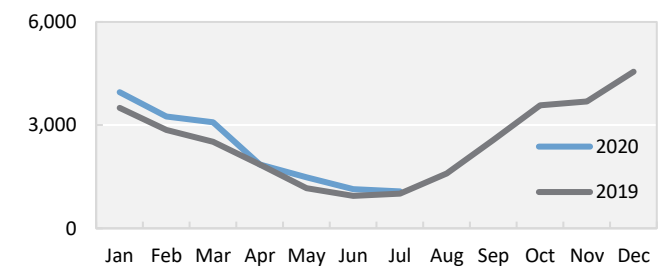
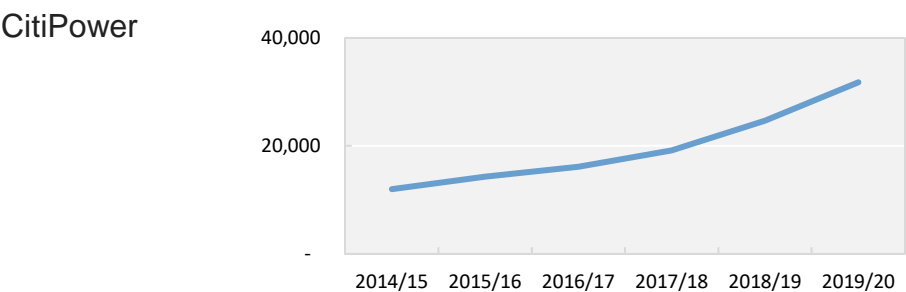
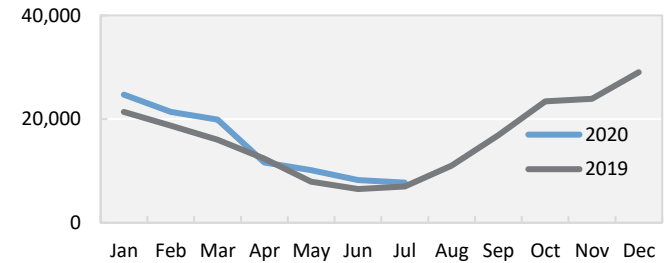
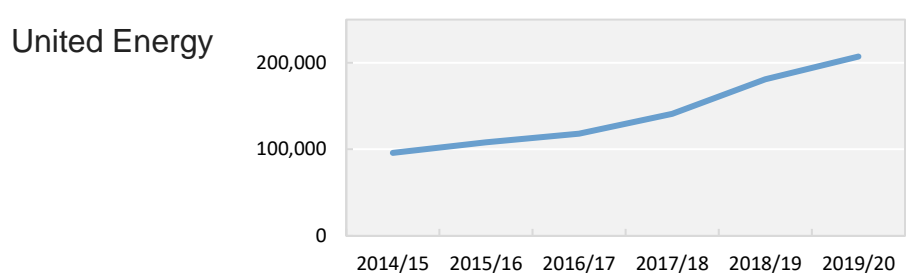
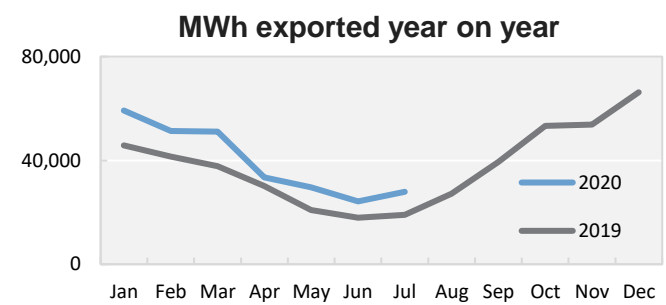
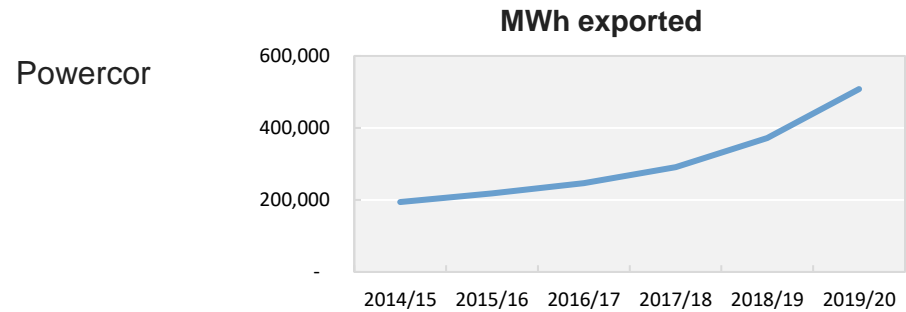
- Solar connections, unit sizes and exports continue to grow
- Solar cause network voltages to rise and subsequently, solar inverters to trip off
- If an inverter trips, a customer can neither export nor self consume from their solar system

Solar Connections



Solar continues to grow

Export Trends



Solar enablement program

Because solar is important, but requires network investment, our program was focussed on preparing the network to accommodate only the efficient amount of solar. Ensuring an efficient amount of solar maximises the benefit to the community

Original proposal

We proposed to:

- Make export capable connections for the large majority of our customers
- Enabling our customers to connect a 5kW system with export capability
- Remove 95% of the solar constraint that would otherwise occur

We committed to our customers that going forward, instead of constraining them when we normally would, 95% of the time we will enable their 5kW systems to be connected and allowed to export. The other 5% was deemed uneconomical

We proposed to only enable solar when the benefits—the wholesale generation cost savings and carbon emission reduction—exceeded the cost

We assessed the network's solar capacity and the efficient level based on a data led approach—using over 38 billion actual data points from our Advanced Metering Infrastructure. The information has enabled us to pinpoint the least cost way to address a constraint, including by:

- Applying smart settings to customers' solar inverters
- Leading the industry development of Dynamic Voltage Management System (DVMS) to 'tap' down voltages
- Undertaking efficient network investment

DVMS

This is a combined IT and network system that monitors voltages and if they are too high, it automatically lowers them. This is very effective at improving solar outcomes across a large number of customers, but also has limitations due to the voltage spread within large areas.

We are leaders in developing and deploying this technology

Solar enablement feedback and actions

We have heard:

- While an efficient level of solar export and connections may deliver the greatest benefit to the community, maybe at this stage it is unaffordable
- We need to investigate use of technological solutions

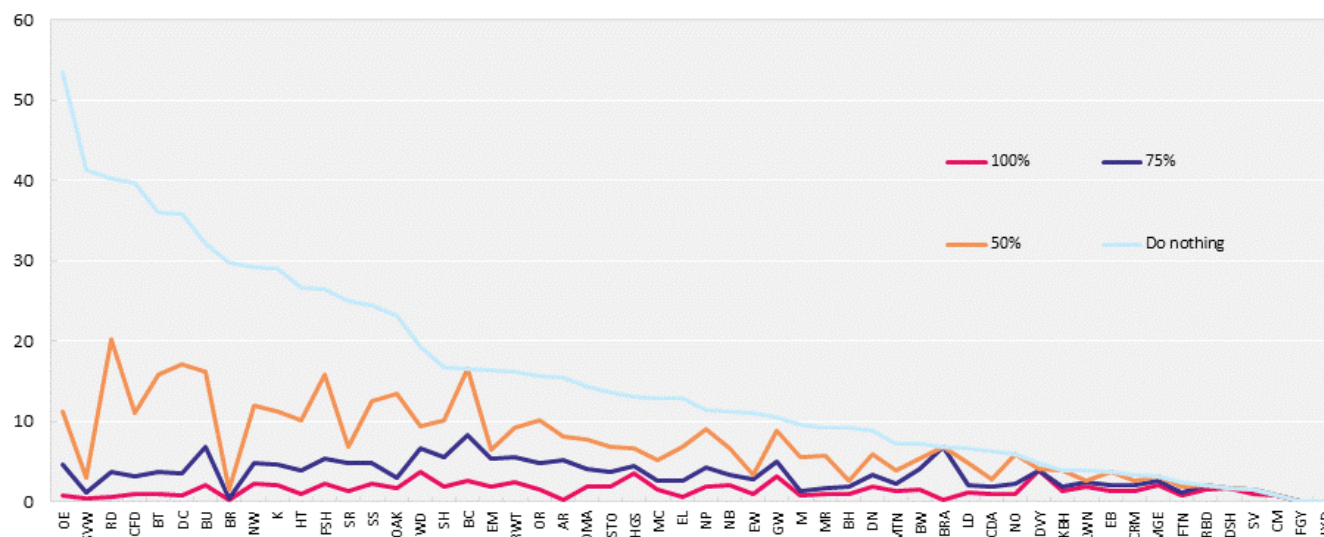
We are seeking to do this by:

- Reviewing the outcomes we can potentially offer and working with stakeholders to determine the most favourable outcomes
- Further enhancing the role of DVMS to manage voltages in smaller geographical areas using existing HV regulator assets
- Examining possibilities presented by DERMS

Solar enablement options — United Energy case study

However, feedback has suggested the target of the program—enabling the efficient level of solar—might not be the right outcome at the moment, more emphasis may need to be placed on affordability.

Percentage of daylight hours solar experiences constraints in 2025/26 (by zone substation)



Program	Customers with improved voltages and opportunity for solar/less tripping	Average time tripped (2026)	Incremental bill impact per annum	Investment (capex + opex)
100%	246,911	1%	\$0.97	\$41m + \$3.2m
75%	192,178	4%	\$0.84	\$31m + \$3.2m
50%	132,446	8%	\$0.70	\$21m + \$3.2m
Do nothing	0	16%	\$0	\$0.0

'Average tripping' can understate the impact—likely to be little tripping in winter and more in spring

Digital network—managing future network costs

Digital network is proposed new technology investment to *ensure we get the most out of the existing network* by encouraging more flexible electricity and DER use

In response to strong stakeholder feedback that Digital Network should be more focused and streamlined, we are reviewing where we focus our resources to get the most out the investment and better demonstrate its benefits

- our original proposal did not demonstrate customer benefits well, including from additional devices on the network
- the most valuable investment in technology leads to lower augmentation costs
- we needed more ambitious plans for customer-side solutions

There is an opportunity to refocus Digital network to be centred around facilitating greater demand management and third party participation on our network by developing a platform that:

- identifies network constraints—using AMI data to model where electricity is flowing on the network to identify overloaded / near overloaded assets—using ‘frequent data’ *not* ‘real-time data’, without any additional network devices
- publish network constraints for us and third parties to use—enabling competitive markets behind the meter
- enable us to engage and monitor demand management outcomes rather than doing it manually

Demand management delivers benefits to customers by:

- lower network demand and augmentation costs—including easing any demand pressures from future growth in EVs
- limiting demand driven regulatory asset base growth
- helping the market accommodate more innovative solutions to integrating renewable generation

Digital network also helps manage DER integration

Digital Network does not remove solar constraints on the network, but it helps! It comes in a package of initiatives that compliment our Solar Enablement program

Digital Network can get the most out of solar on the network via the development of a low voltage distributed energy resources management system (LV DERMS) and developing dynamic operating envelopes:

LV DERMS

This is an IT system that monitors the network to identify DER constraints.

When they are found, though this tool we can actively manage the constraint to provide better and more certain outcomes to customers and aggregators.

Dynamic operating envelopes

Sends out signals to DER devices on the networks limits that can operate within. Customers and aggregators can operate DER with these local and time varying network limits.

- Ensure virtual power plants and aggregators can identify how much DER electricity is available to them at any given time, and operate within the constraints of our network
- Dynamic connection agreements—allow us to connect larger sized solar inverters in areas of no constraint and then dynamically ramp these down later when constraints do emerge
- Mitigate individual customer solar tipping by instead ramping down solar output from all customers at times when constraints are present
- Critical to ensure we get the most benefits possible out of the solar enablement program—ensuring phases are balanced

This will:

- stimulate the aggregator business models meaning customer can participate in, and benefit from, more market opportunities
- enable us to better use existing assets by allowing the connection of more solar
- provide fairer outcomes for all customers

Digital Network and Solar Enablement together give us the tools to tackle the energy market transformation efficiently, making the customer journey as seamless as possible with regard to price and experience

Managing DER

What role can tariffs play in helping to accommodate DER?

Time of use

We are proposing a time of use tariff where electricity prices are lower during the day and higher at peak times. Will this encourage EVs to charge off peak?

Solar sponge

SAPN set a low rate during high solar output of 3.45 c/kWh to encourage customers to 'soak up' solar. Our proposed rate is 4-5 c/kWh (time of use tariff off-peak rate). Customers can opt out of this rate. Have we done enough?

Export tariffs

Three new rule changes have been submitted to enable distributors to charge customers for exporting solar into the network, rather than recover the costs from all customers. Is this a fairer approach?

DEIP access and pricing Rule change

Base level of export

There is a proposal that there be a base level or minimum level of export provided to all customers. Do you support this? What should the base level be?

Firm access

Another proposal would allow customers in certain circumstances to pay extra to acquire firm access such that they could not be tripped off. Is this a good idea?

Incentives

The potential for an incentive scheme has been discussed whereby distributors would be rewarded or penalised depending on the amount of export capacity they can provide. Is this an initiative you would consider?

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