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“Jemena”
is an Aboriginal word
that means “to hear,
to listen and to think”



Acknowledgement of Country

Jemena acknowledges the Traditional Owners of the land on which we operate and recognises their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

Artwork is by Chern'ee Sutton a contemporary Indigenous artist from the Kalkadoon people from the Mount Isa area in Queensland.

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Abbreviations

ADMD	After Diversified Maximum Demand
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AMI	Advanced Metering Infrastructure
BESS	Battery energy storage systems
BTM	Behind-the-meter
CECV	Customer Export Curtailment Value
CER	Consumer Energy Resources
DEECA	Department of Energy, Environment, and Climate Action
DNSP	Distribution Network Service Providers
DPV	Distributed solar photovoltaic
DR	Demand response
DVM	Dynamic Voltage Management
EDC	Electricity Distribution Code
EDPR	Electricity Distribution Price Reset
ERG	Energy Reference Group
ESS	Essential System Services
EV	Electric Vehicle
FIT	Feed in Tariff
FOTM	Front-of-the-meter
LV-DERMS	Distributed Energy Resource Management System
MSL	Minimum System Load
MV	Medium Voltage
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
OE - Export	Export Operating Envelope
OMS	Outage Management System
PBST	Powerline Bushfire Safety Taskforce
POE	Probability of exceedance
PV	Photovoltaic
RAPS	Remote area power supplies
REFCL	Rapid Earth Fault Current Limiter
RERT	Reliability and Emergency Reserve Trader
RINs	Regulatory Information Notices
SAPN	South Australian Power Networks

1. Customer engagement insights

Customer Voice Groups – key themes and messages

Two Customer Voice Group sessions were held across the six groups to gain greater insights into the experiences, views and preferences of our customers.

The second session held in November—for each group—focused on ‘equity and pricing’ and what ‘fairness means’ for customers in the context of electricity pricing.

Part of an exercise that explored fairness in the session drew out what ‘key message’ customers would like us to share with the People’s Panel for their consideration in making recommendations to Jemena and thinking about the diverse customers and lived experiences of customers outside of the people’s panel.

The table below includes the key messages from each Customer Voice Group across several themes. Highlighted in yellow are the messages customers wanted to share on what fairness means to them.

Consideration for the Energy Reference Group

Review the key messages from customers and consider how the advice you provide Jemena acts in the best interest of customers and acknowledges the challenges they face (where possible).

Customer Voice Group	Theme	Key Message
Mental Health Customer Voice Group	Accessibility to electricity	How to increase accessibility without burdening other consumers who wish to pay for their usage only.
Multicultural Customer Voice Group	Balance	How can we balance, paying less, aim for more benefits and focus for a sustainable future
Seniors Customer Voice Group	Batteries	Batteries are expensive.
	Batteries	Batteries can be dangerous.
	Batteries - community bank	Explore community battery banks, especially as new developments are built.
	Batteries - incentives	Give more incentives with subsidises to install batteries.
	Batteries - lifecycle	The batteries will only last so many chargers and then they need to be replaced.
Disability Customer Voice Group	Close the Loop	Feedback would be great on how and whether the ideas and feedback presented here have been used by the People's Panel and Jemena.
Seniors Customer Voice Group	Community based generation	We want to encourage community-based generation and batteries.
	Compensation for solar feed in	Compensation on our essential connection cost with all the solar power we're contributing to the grid. If not, all the power we're contributing to the grid should be cover cost of installing all the infrastructure needed!

Customer Voice Group	Theme	Key Message
Disability Customer Voice Group	Contribution to society	Pricing is beyond a \$1 bigger should include social and economic and governance outcomes - Ensure there is a contribution to society - what else do we do.
	Cost burden	Every additional cost layer will be felt by all of us.
	Cost of living impacts	Having a disability is expensive, and people with disabilities are more likely to be facing COL pressures. From that perspective, fairness means keeping prices as low as possible.
	Customer centric advice	To be able to clearly articulate the type of solution delivered based on the individual's needs - E.g. What would be the best battery for me etc.
Multicultural Customer Voice Group	Customer education	contentious education of customers of any changes that is upcoming with asking to feedback from them
Young People Customer Voice Group	Customer education	more understanding on how Jemena works to be circulated among consumers to better understand
Disability Customer Voice Group	Customer lived experience	Have empathy for all experiences, life stages and circumstances.
	Diversity awareness	Ensure diversity awareness all through Jemena - Governance - Employees - across the business.
Mental Health Customer Voice Group	Electricity demand	How to balance the increasing SINKS/DINKS households and bigger households and what effect that has from a distributor perspective
Seniors Customer Voice Group	Environment	Environmental considerations should be paramount - if we kill the planet all other considerations are moot.
	Equity - user pays	Coming up with an equitable way for all users to pay for batteries - if batteries were far more widely owned by users across the grid there would be less need for investment in poles/wires. Therefore, the money that would have to be spend on poles/wires could instead be invested in financing batteries for those who cannot afford them.
Disability Customer Voice Group	Essential Service	Electricity as an essential service and that should be reflected in the pricing - a system that ensures it is accessible to everyone.
Multicultural Customer Voice Group	Fairness	Large companies obtain electricity at wholesale prices, is this fair?
Mental Health Customer Voice Group	Fairness	Things need to look fair not just be fair (i.e. there needs to be a perceived fairness for consumers).
	Fairness - capacity for solar	How to balance the cost of building the 'dual carriageway' into a system originally designed for one way travel, sharing that cost with households who have the opportunity to go solar against those who do not (renters, apartment dwellers)
	Fairness - capacity for sustainable choices	There are a lot of people already trying at an individual level to move to a sustainable future. However, the panel need to also be aware that there are also people who are unable to move to a

Customer Voice Group	Theme	Key Message
		sustainable future on an individual level (i.e., strata, rental, etc)
Young People Customer Voice Group	Fairness - capacity to afford options	Going to just restate what I've said a few times about poor people having a higher burden, they live in houses that are less insulated, they can't afford to buy more energy efficient products and particularly in the case of an unemployed welfare recipient they spend more time at home using electricity because they don't have a job to go to during the day so they face the brunt of electricity costs in all directions but have the least capacity to afford to pay for their electricity and most burdened, so much anxiety about heating vs food etc. this issue is exasperated if they have children for example single parent with children, the children also use additional power but only one welfare income so just being very clear about this side that not everyone sees or know about if they haven't witnessed it for themselves.
	Fairness - financial situation	greater thought on different financial capabilities of consumers
Seniors Customer Voice Group	Fairness - paying for solar	Not feasible for all to install solar panels, why should I pay for others?
	Fairness - paying for solar	People who come from lower socioeconomic and disadvantaged backgrounds should not pay for costs associated with solar panels.
	Fairness - paying for solar	We have already paid for solar panels but now we have to pay for new users.
Young People Customer Voice Group	Fairness - pricing	Individual customer's financial situation and usage should be taken into account when considering pricing and passing along costs. Perhaps customers that earn more or have a greater presence on the grid should pay more.
Mental Health Young People Customer Voice Group	Fairness - pricing	Consider the various groups of customers (i.e. renters and owners, those with or without solar panels and/or batteries, city and country, concession and non-concession holders) in setting prices for the next reset period to ensure they are fair and equitable.
	Fairness - pricing	How do make sure there is a balance between the provision of service and the balance between appropriate costs to individuals?
	Fairness - profit	How does Jemena balance incentives to provide a good system vs just a profitable one. What is the role of regulation, vs just profit from an internationally owned business distributing a critical service?
Young People Customer Voice Group	Fairness - renewables	We want renewable energy, but understand it's an expensive and slow process; that cost should be on the shoulders of all energy consumers, not only those already paving paths for renewable energy because it's too tricky to handle now

Customer Voice Group	Theme	Key Message
Multicultural Customer Voice Group	Future proofing	Jemena to look at future proofing new infrastructure and commit to remove infrastructure if it becomes redundant or polluting (for example old power plants - just an example as that is not Jemena but Energy)
	Government role	Can govt take initiatives to pay for the renewal energy
Disability Customer Voice Group	Hear Us	Hear what we are saying and take everything into consideration all inclusive!
Mental Health Customer Voice Group	Incentives	What incentive is there for consumer to stay loyal to an energy retailer?
Seniors Customer Voice Group	Incentives	Incentives other than government grants.
Disability Customer Voice Group	Inclusive & Accessible	Hear what people with disabilities (Disability Customer Voice Group) have to say - being inclusive of people with disabilities & have clear and accessible information.
	Inclusive & Accessible	You must be inclusive & accessible to all customers and keep it simple.
Mental Health Customer Voice Group	Infrastructure costs	What is the fear that solar panel people have to pay for the infrastructure?
Young People Customer Voice Group	Insulation	Homes should be built with better insulation so that energy usage (climate control) is lowered
Disability Customer Voice Group	Intersectionality & Life stage	Ensure there is awareness for all customers and at all phases of their life - Intersectionality other experiences should be taken into account multiple experiences.
Young People Customer Voice Group	Micro grids	Consider micro grids
Seniors Customer Voice Group	Network security	Even with a lot of solar, we want the security of the network.
	Network security	Provide a robust network that can cope with disruptive issues as they arise.
	Peak period timing	Why does the retailers peak period differ to Jemena's peak period?
	Production	Balance coal fired production and solar generation to the distribution system capabilities.
Multicultural Customer Voice Group	Renewables	What benefits to us presently for going onto renewables compared to focusing on net zero and renewables.
	Renewables	Proper commitment from Jemena to focus on renewables, generating solar from homes and heading towards net zero
Mental Health Customer Voice Group	Retail competition	Does competition in the retail market lead to cost benefit to the consumer.

Customer Voice Group	Theme	Key Message
Mental Health C Customer Voice Group	Retailers	Lack of retention strategies from the retailers and no loyalty bonuses for staying with a retailer. Very different to other consumer-based industries like telecom.
Seniors Customer Voice Group	Retailers	Retailers benefit from us installing solar so they should pay for the upgrade to the grid system.
Disability Customer Voice Group	Role in keeping customer costs low	What can distributors do to ensure that we keep electricity costs low for those who rely on it to live.
Seniors Customer Voice Group	Solar - costs	Ongoing cost of solar panels (maintenance, cleaning etc.).
	Solar - investment advice	Would be good if there were some unbiased, reliable authority who could advise an individual on whether or not it is appropriate for them to invest in solar panels / batteries etc, taking into consideration their particular location (e.g. are there many others in the area who are already feeding in). Just adding to the "congestion" in some circumstances might be less than helpful.
	Solar - role in network	Solar generation shouldn't be blamed for inability of poles and wires to accept their extra electricity.
	Solar - technology upgrades	Technology for batteries is advancing quickly - concern that battery will be redundant in a few years' time? Can Jemena offer an upgrade to the battery if technology advances?
Disability Customer Voice Group	Solar & contingency	Solar panels will increase, so we need something else to keep big factories going. We need something on standby when the solar panels don't work and the wind doesn't blow.
Seniors Customer Voice Group	Solar panels - costs	Return on investment does not recover the cost of installing solar panels.
Multicultural Customer Voice Group	Solar to the grid	Can solar panel rates for adding electricity back into the grid be increased and the customer gets better rates?
First Nations Customer Voice Group	Sponsorship & incentives	Sponsorship of indigenous organisations, education organisations, sporting groups, scholarships. There's a whole range of incentives (tax deductible) you could give back to community.
Seniors Customer Voice Group	Supplier incentives	Suppliers not giving any incentives for the cost of batteries, if so, they wouldn't need to spend so much money on infrastructure.
Young People Customer Voice Group	Tailored bills	Wanting more tailored bills and not just flat rates
Disability Customer Voice Group	Transparency	Transparency.
Seniors Customer Voice Group	Transparency	More regulation and accountability needed for transparency.

Customer Voice Group	Theme	Key Message
Young People Customer Voice Group	Transparency - information	• Re: to transparency maybe putting up how we're tracking for climate change and the infrastructure change in public spaces
	Transparency - pricing	• Greater transparency over price and running costs that contribute to bills
Multicultural Customer Voice Group	Transparency - what affects bills	• Better transparency in fluctuation of rates that effects our bills
Disability Customer Voice Group	Transparency from retailers	• Want transparency across all parts of energy, especially from the retailers.
	Working within the system	• We won't unscramble the egg, we have distributors, generators, retailers. We have to work within the system we have.

2. Levers to support the network, issues of fairness and equity

Background

Jemena faces challenges in system stability and reliability that are caused by the energy system transition to non-synchronous forms of generation. Non-synchronous generation produces a different amount of electricity depending on the energy available. It does not produce the same amount of electricity all of the time. This makes it less reliable, and more difficult to bring onto the grid.

In order for Jemena to play an active role in enabling and facilitating the transition, there are several choices to consider when developing this forthcoming price reset submission. Inherent in these choices is the question of “equity and fairness” to different classes of electricity consumers / prosumers.¹

The Export Conundrum

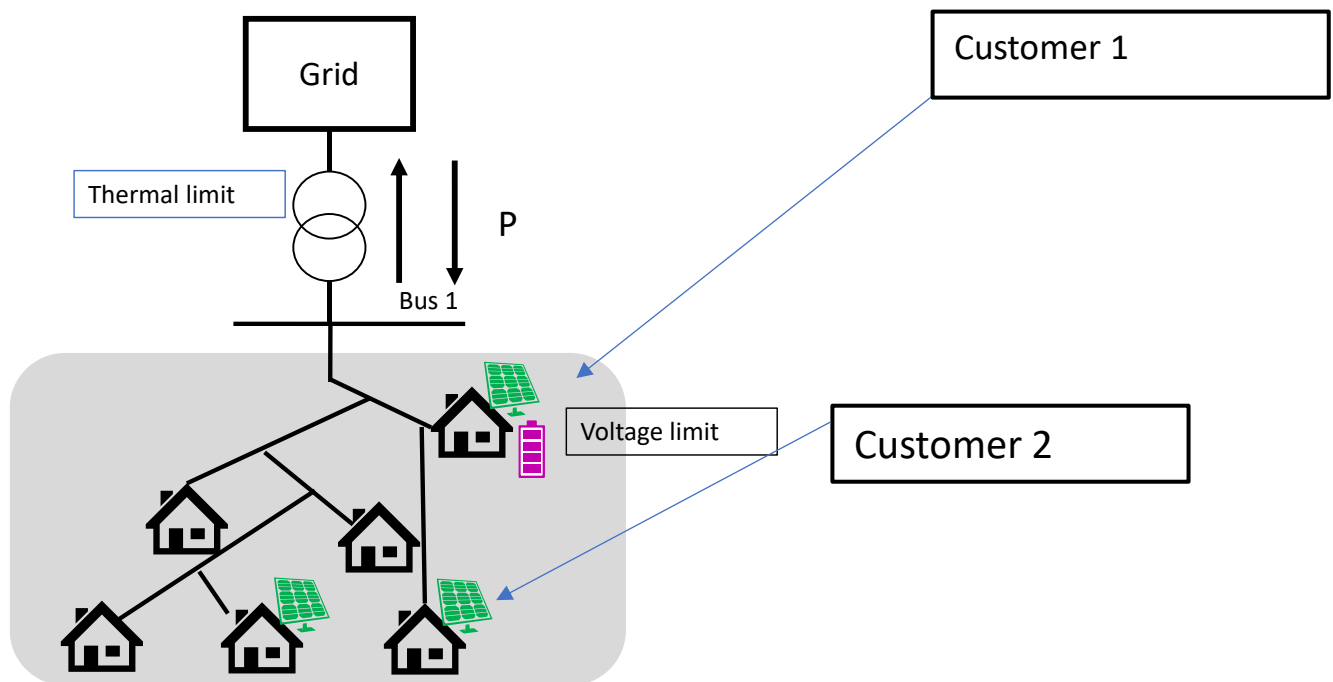
Note on Jemena’s role: *To maintain the segregation between generation, transmission and distribution function, Distribution Network Service Providers (DNSPs) like Jemena is not allowed to own generation assets. For customer-owned generation systems, such as Distributed Photovoltaics (DPV). Jemena has an obligation to connect them under its Electricity Licence conditions but does not have an obligation to allow export back onto the grid; this approach will restrict how much generation systems can be installed. That said, with the increasing penetration of DPVs and the significant role they will play in the renewable energy future of Australia, Jemena is playing an increasingly active role in facilitating DPV connections through a number of initiatives in its Electricity Distribution Price Reset (EDPR) proposal.*

Australian electricity distribution networks, in particular the Medium Voltage (MV) and Low Voltage (LV) networks, are historically designed to supply electricity to consumers.

Because of this design, there is limited capacity to accept reverse power flow from prosumers who have installed Distributed Photovoltaic (DPV) systems and who choose to export surplus power back to the grid. Excessive reverse power flows can cause the local distribution network to exceed the regulated voltage limit at the point of generation injection and thermal limit at the upstream substation, as illustrated in Figure 1:

¹ A prosumer is a customer that not only consumes electricity, but also produces electricity from time to time, and exports that electricity back onto the electricity grid.

Figure 1. Illustration of thermal and voltage limit on LV networks



The physical limits an electricity network experiences consist of:

- **Thermal limit** – A limit relating to the thermal capability of a network asset to carry consumption (or generation) of customer equipment. If the limit is exceeded, the network asset will reach a temperature that could cause damage to the asset.
- **Voltage limit** – The voltage that a DNSP supplies to its customers is required by regulations to be within a range defined by limits (the lower and upper limits). Customer electrical equipment is designed with these limits in mind. The consequences of exceeding these limits on customer equipment include inefficiency, sub-optimal performance, reduced life or even damage.

The maximum export limit at a customer connection point, without exceeding the voltage and thermal limits, is called the export operating envelope (OE - Export). Jemena must determine a maximum OE – Export for the Customer Energy Resource (CER) at the customer connection point to operate the electricity network within technical limits. In addition to these operating envelope constraints, system security requirement from AEMO mandates solar exports to be curtailed under certain minimum system load conditions from time to time.

When determining an OE – Export to multiple CERs in the same LV (or MV) circuit, several technical, economic and sociological considerations must be taken into account:

- **Static or dynamic OE** – The impacts of electricity injection into the distribution network vary depending on the balance between generation and consumption at any given point in time. As consumption varies during the day, so does the technical capability of the distribution network to accept electricity exported into the electricity network. If Jemena designs a static OE – Export with its customers, it has to consider the “worst” case scenario, and therefore, the static limit will be set at a low (conservative) level. A time-varying or dynamic export limit is better than a static limit as it allows more export when the network can handle it and pares back export limits when it can’t. This approach allows prosumers to export more electricity more often and only limits exports in those few “worse case” scenarios throughout the year.

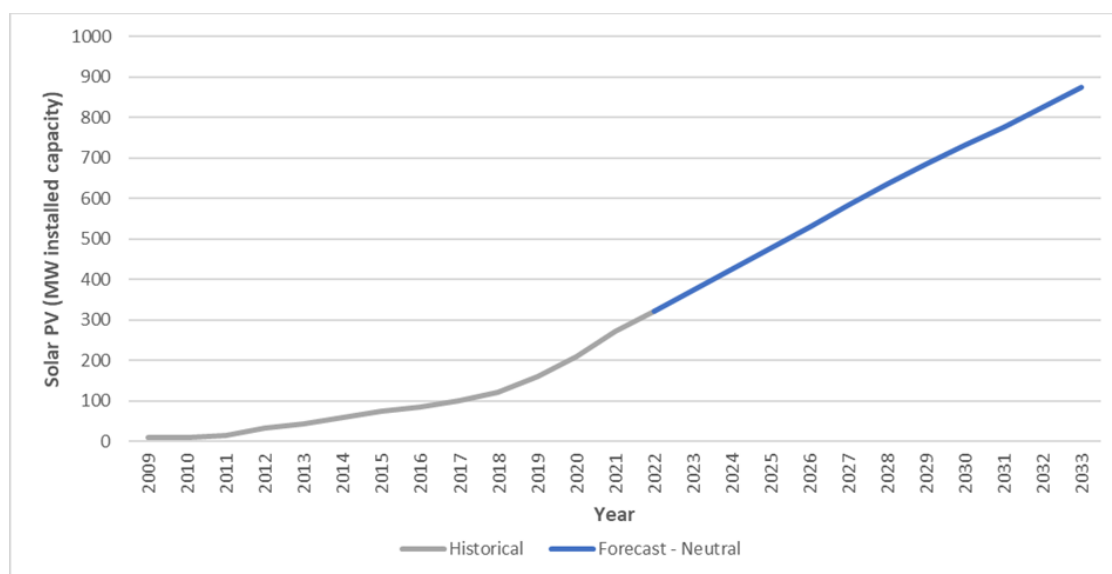
Dynamic Operating Envelope (DOE), however, is more complex to design and requires a communication infrastructure to transmit the DOE to the CER and a compliance regime to ensure the DOE is adhered to;

- **Fairness in OE allocation** – According to the laws of Physics, CERs that are closer to the grid supply source (e.g. customer 1 in Fig. 1) will be able to export more electricity into the grid without exceeding the network limits when compared with CERs that are at the end of the distribution circuit (e.g. customer 2 in Fig. 1). If OE allocation is based on the principle of maximising export, then customer 1 will be allocated more export capacity compared with customer 2. However, if OE allocation is based on the principle of equity between customers, then all customers will be allocated the same OE, and in this example, customer 2 will limit what all customers can export in this local circuit. There are many considerations under this approach; for example, what if customer 2 does not want to export electricity? Should customer 1 be constrained to the lower limit, and what are the social impacts of the loss of ability to export?

A more thorough examination of the various OE allocation methodologies can be found here.²

- **First come, first serve** – There were very few DPVs installed by Jemena customers until the premium solar feed-in tariff (FIT) was introduced on the 1st of November 2009 in Victoria, offering residential a rate of 60 c/kWh for exported solar energy³. As the percentage of DPV increased and its costs came down, the FIT was reduced. Despite this, DPV installations have continued to increase (Fig. 2). Electricity distribution businesses, Jemena included, have allowed the connection of DPVs provided they meet technical requirements, including compliance to inverter sizing. As spare network export capacity is used up, distribution businesses have started to restrict the allowable export from new DPVs in parts of the network; in some cases, the restrictions prevent electricity exports to the grid altogether. This raises the question of fairness for new DPV customers.

Figure 2. Cumulative capacity of installed solar PV systems within Jemena's supply area



² University of Melbourne: Project EDGE Fairness in Dynamic Operating Envelope Objective Functions, April 2023, <https://aemo.com.au/-/media/files/initiatives/der/2023/the-fairness-in-dynamic-operating-envelope-objectives-report.pdf?la=en>

³ <https://www.energy.vic.gov.au/for-households/solar-premium-feed-in-tariff>

- **Charging for export service** – the current Jemena network tariff structures are based on consumption and not on export, even though it can be argued that export requires the same electricity infrastructure as does import. This creates a potential equity issue between prosumers and consumers.

Consideration for the Energy Reference Group

How can Jemena ensure that the allocation of export limits is efficient for the energy market while it is also fair among export customers?

Should Jemena provide dynamic export limit or static export limit?

What is the appropriate mechanism to allocate limited export capacity? Is “first come first serve” the right approach?

Currently Jemena only charges residential customers for consumption and not for exporting energy back into the grid. Should Jemena charge for export service?

The Import Conundrum

Note on Jemena’s role: *Jemena has an obligation under its Electricity Licence to connect customers who want supply of electricity. As customers install more electrical equipment like EV chargers and replace their gas appliances with electrical equivalents, electricity consumptions go up necessitating more investment from Jemena into its electricity distribution infrastructure to meet the increasing demand.*

As discussed in the previous pre-reading materials, the energy system transition over the next decade will result in increasing exports (and decreasing minimum demand) but we also expect to see an increase in electricity imports (and increasing maximum demand) due to the uptake of electric vehicles and greater electrification of household and industry energy use.

What we find with these trends is that the time of increase in exports does not generally align with the time of increase in imports.⁴ While the increasing use of electricity is a phenomenon welcomed by the electricity industry, the non-coincidence of peak generation and demand is placing increasing strain on the electricity supply networks.

The traditional approach to address increased electricity imports is to install more network assets and, therefore, capacity to cater for increased load conditions. However, this approach may neither be efficient nor sustainable when compared to alternative approaches.

Excessive load imports lead to similar problems on the distribution network as excessive exports, including breaching voltage and thermal limits. The maximum import limit at a customer connection point without exceeding the voltage and thermal limits is called the import operating envelope (OE - Import).

However, unlike electricity exports, the Electricity Distribution Licence requires distribution businesses, including Jemena, to supply customers with their electricity consumption.

For electricity loads that are controllable and flexible—such as EV and residential battery charging—it could be appropriate to extend the mechanism of OE to cover both export and import, allowing

⁴ This timing difference occurs in different time dimensions, including the time of day and seasonal differences.

customers to use more electricity when the network allows. This will result in flexibility in the supply network. However, does this conflict with the obligation to supply?

There is a contractual limit at the moment and a "hard limit" based on the size of the fuse installed at the connection point. The idea of using dynamic import OE is to allow customers to use electricity above the contractual limit (but still below the hard limit imposed by the fuse) when the network has spare capacity. The contractual limit depends on the deemed standard connection contract that is enforced at the time and the After Diversified Maximum Demand (ADMD) that utilities use to plan for the electricity distribution network.

Also, similar to the case for export, the law of Physics dictates that customers located at the end of a distribution circuit will experience voltage issues before the customers who are located close to the supply source. The allocation of flexible import capacity will have to address the same issues of market efficiency and fairness.

Consideration for the Energy Reference Group

Do you support the allocation of import limit for controllable loads? How could this work?

Similar to the case for export, the law of Physics dictates that customers located at the end of a distribution circuit will experience voltage issue before the customers who are located close to the supply source. The allocation of flexible import capacity will have to address the same issues of market efficiency and fairness.

How should the import limit be constructed so it is fair and equitable for customers with and without flexible loads while promoting efficient utilisation of the distribution network?

Solar PV Backstop Mechanisms

Note on Jemena's role: The Australian Energy Market Operator (AEMO) has primary responsibility for power system security (i.e., Grid Stability) under National Electricity Rules (NER) Clause 4.3.1. To support this requirements, Distribution Network Service Providers (DNSP) (including Jemena) must respond to an AEMO directive under NER Clause 4.3.3. These powers and obligations contribute towards ensuring the stability of the national electricity system.

In August 2021, AEMO issued a directive to Jemena and the other Victorian DNSPs, to identify and implement measures to restore power system security from threats caused by increased levels of uncontrolled DPV within their respective networks. The directive has resulted in a mandate from the Victorian Government Department of Energy, Environment and Climate Action (DEECA) that Victorian DNSPs adopt an emergency DPV Backstop capability on all new and modified DPV systems to allow DPV output to be monitored and curtailed at times required by AEMO to maintain power system security.

As discussed in meeting #3, declining minimum system demand has resulted in the need to curtail DPV generation to maintain system security. When such a need first arose in South Australia, SA Power Networks (SAPN) introduced a backstop mechanism that raised the network supply voltage in the specified local zone substation areas to cause the DPV systems to trip on over-voltage protection.

This approach was considered a "stop-gap" design as it had the unintended consequence of subjecting customer appliances to higher voltage during the backstop events (potentially contributing to appliance damage or shortened lives) and was also indiscriminate in its action. SAPN has since

moved to use the dynamic export OE approach as the preferred means to regulate DPV export in accordance with prevailing network capacity, and the backstop mechanism can be achieved by sending a zero export signal.

Jemena is considering using export OE as the solution to address both the Victorian Government's solar PV backstop requirements and to facilitate more solar export into the NEM. Over time, the solution can be extended to cover import OE as more flexible loads come onto the network.

Consideration for the Energy Reference Group

Do you agree with the Jemena approach?

Are there other ways to manage network export constraints that should be considered?

The Case for Tariffs

The discussions so far on operating envelopes focus on what Jemena can do as a network business to ensure export and import behaviours will not lead to supply quality non-compliance, deteriorating supply reliability or system stability by controlling appliances and CER.

But is there a way to create incentives to induce customer response rather than firm control by network businesses? Jemena is aware that appropriate tariff designs will incentivise customer behaviours that could achieve similar outcomes as the behaviours become ingrained.

We will discuss Jemena's tariff design in future ERG meetings.

Low Voltage Network Management & Control

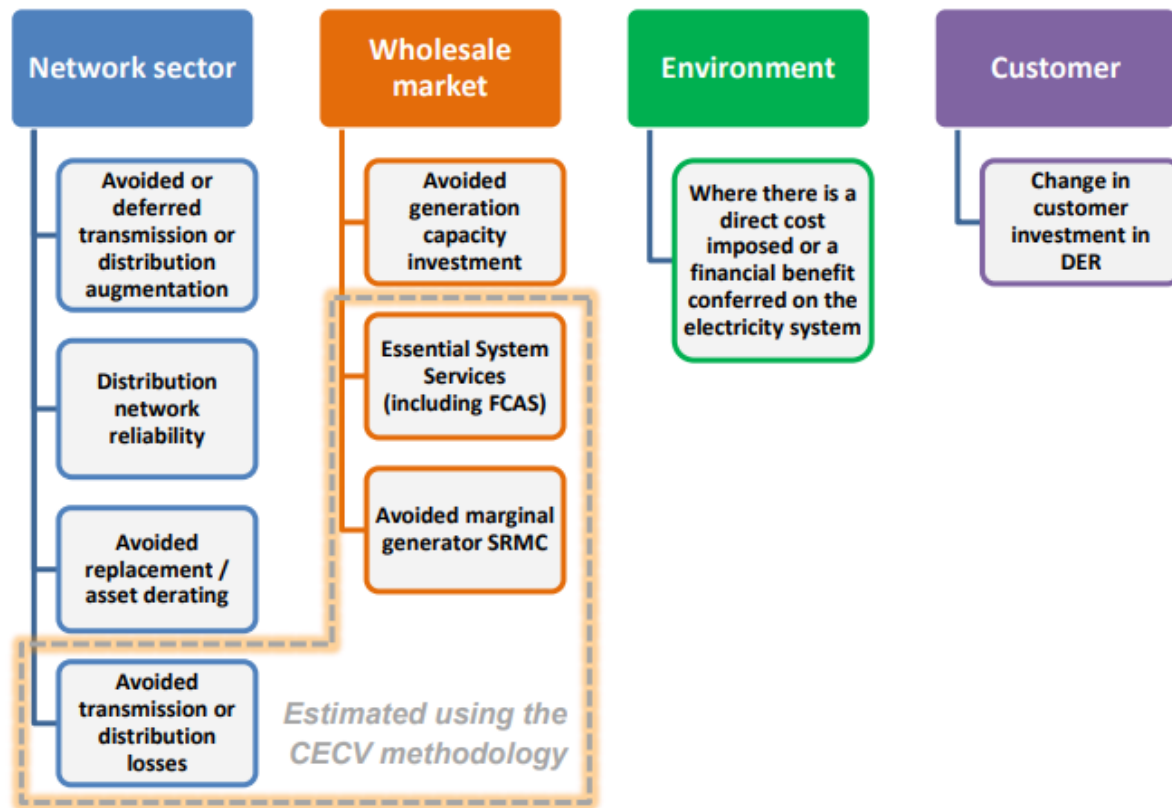
Note on Jemena's role: *Jemena is required under the Electricity Distribution Code (EDC) to supply electricity within specified technical parameters (e.g. within the voltage range of 230V +10%/-6% at Low Voltage (LV) customer supply points). This is to ensure that electrical equipment and appliances will perform as designed.*

While the electricity distribution networks are not traditionally designed for export service, technologies are available today that can be retrofitted to existing networks or be incorporated in greenfield⁵ designs that can improve the network capacity to host CERs. There is also a need to increase the visibility of the network as "what gets measured gets fixed". In this regard, Jemena has and will continue to make investments in LV network visibility tools that leverage its Advanced Metering Infrastructure (AMI) and big data analytics platform. With voltage compliance a major issue caused by the variability of two-way power flows in the LV and MV networks, Jemena is considering investing in a Dynamic Voltage Management (DVM) platform that can respond dynamically to changes in the two-way power flow, to ensure that supply voltage is always delivered within the regulated voltage limits.

⁵ Greenfield meaning new estates or new customer connections in new areas, rather than existing areas, of the electricity network.

Investments in these network management and control systems are currently justified via AER's published methodologies such as the Customer Export Curtailment Value (CECV) methodology⁶. A high-level diagram depicting the various value streams of DER is shown below:

Figure 3. DER value streams provided by AER guidance



Consideration for the Energy Reference Group

Are there other value streams that should be considered in integrating DER?

Who should capture these value streams and how can these be shared with customers?

⁶ AER: Final CECV Methodology, June 2022, <https://www.aer.gov.au/system/files/Final%20customer%20export%20curtailment%20value%20methodology%20-%20June%202022.pdf>

Community Batteries

Note on Jemena's role: To maintain the segregation between generation, transmission and distribution function, DNSPs like Jemena are not allowed to own generation assets, and this includes Community Batteries.

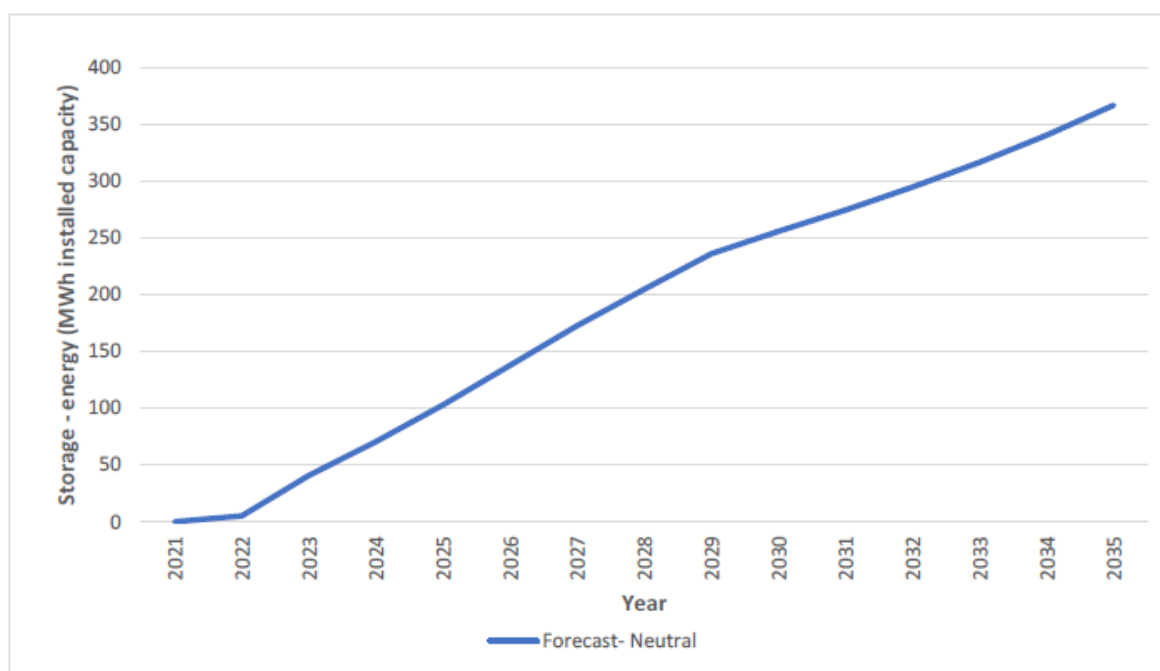
The big challenge associated with electricity generation and end use is that there needs to be an instantaneous balance between electricity generation and consumption. Even a small imbalance between generation and consumption will deteriorate the quality of the electricity supplied, while a larger imbalance can result in a loss of system stability and cascaded blackouts.

Energy storage systems can restore the imbalance by storing the energy when generation is in surplus and supplying the energy when generation is in deficit.

Electrical energy can be stored in many forms, as gravitational energy (e.g. pumped hydro systems in Snowy 2.0), heat energy (e.g. Concentrated Solar), mechanical energy (e.g. flywheels) or chemical energy (e.g. batteries).

In electricity distribution networks, battery energy storage systems (BESS) are more common. These BESS can be installed behind-the-meter (BTM) by customers or front-of-the-meter (FOTM) by electricity distribution companies. Below is Jemena's forecast of battery storage system uptake:

Figure 4. Forecast uptake of battery storage systems (MWh installed capacity) within Jemena's ⁷supply area



Many BESS customers have DPV and use the BESS to store excess solar generation during the day and use the stored energy during the evening peak time. This use case of BESS can benefit the distribution network by reducing the amount of solar export back into the grid at times when the grid cannot handle any more exports.

While the cost of BESS has been declining, it is still relatively expensive for individual customers. A Community Battery (also known as a Neighbourhood Battery) is a local installation that allows the

battery capacity to be shared among several customers with DPV to store their surplus PV output and then use the stored energy for evening peak time. The sharing can be extended to non-DPV customers who can also purchase surplus stored energy in the community battery. Due to its bigger size compared with individual BESS, there are other possible revenue streams for community batteries, such as providing capacity support to the local distribution networks and participating in energy services for the NEM.

While the concept of community batteries is appealing, there remain a number of regulatory and commercial issues to be resolved before we can see widespread adoption of the technology. A good reference document can be found here⁸.

Apart from remote area power supplies (RAPS), the current rules forbid regulated electricity distribution companies from owning community batteries as they are seen as generation systems. The Commonwealth Government has applied successfully for a class waiver for 400 community batteries to be owned and installed by distribution network businesses and community groups, with several stages of grant funding applications (Community Batteries for Household Solar Program). Jemena has successfully applied for grant funding to support the installation of four community batteries in Alphington, Bellfield, Coburg and Flemington in 2024.

Consideration for the Energy Reference Group

Do you support the concept of Community Batteries?

What do you see are the main issues that need to be resolved for Community Batteries?

What do you see is the role for Jemena in Community Batteries?

⁸ Australian National University: Implementing community-scale batteries final report, December 2020, <https://arena.gov.au/assets/2020/12/implementing-community-scale-batteries-bsgip.pdf>

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