Consumer
Challenge
Panel

Incentivising and measuring export service performance for distributed energy resources

Response to the AER Draft Report of November 2022

AER Consumer Challenge Panel – Consumer Energy Resources (CER) sub-panel

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30 January 2023

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Acknowledgement of country

The authors recognise the traditional owners of the lands on which the Australian Energy Regulator (AER) operates, as well as the lands where this report is being prepared. We respect the elders of these nations, past and present along with their emerging leaders.

Confidentiality

We advise that to the best of our knowledge this Advice neither presents any confidential material nor relies on confidential information.

Consumer Challenge Panel

The AER established the Consumer Challenge Panel (CCP) in July 2013 as part of its Better Regulation reforms. These reforms aimed to deliver an improved regulatory framework focused on the long-term interests of consumers.

The CCP assists the AER to make better regulatory determinations by providing input on issues of importance to consumers. The expert members of the CCP bring consumer perspectives to the AER to better balance the range of views considered as part of the AER's decisions.[1]

The views of CCP expressed in this paper are the views of the members of a sub-panel of CCP members comprising Mike Swanston, Professor Dr Andreas Chai and David Prins.

[1] Detailed information on the CCP is available on the AER website at https://www.aer.gov.au/about-us/consumer-challenge-panel

1 Overview

1.1 The Access, pricing and incentive arrangements for distributed energy resources rule change

In August 2021, the Australian Energy Market Commission (AEMC) published its Access, pricing and incentive arrangements for distributed energy resources final determination. The resulting rule change[2] amended the National Electricity Rules (NER) and National Energy Retail Rules, and tasked the AER with delivery of a package of reform work streams to strengthen customer protections, and the AER's regulatory oversight of the provision of export services by distribution network service providers (DNSPs). These reforms are also intended to provide stakeholders with useful information and insight about the quality of their export services.

We support the intent of the AEMC rule determination to improve access, pricing and incentive arrangements for distributed energy resources. The broader concept to develop greater transparency and incentives for DNSPs to provide efficient export services is highly likely to be beneficial to energy consumers.

1.2 The AER focus on establishing a data gathering and analysis framework, with reputational incentives initially as the driver for better outcomes

The actions and recommendations from the AER's earlier consultation and its draft report on incentivising and measuring export service performance are essentially focused on establishing a data gathering and analysis framework, with reputational incentives initially as the driver for better outcomes. We do not object to this approach, as we recognise that the many environmental variables and peculiarities across the DNSPs, and even within an individual DNSP, will make it challenging to establish a new framework. How the findings from data gathering and analysis will drive more prudent and effective operation by the network businesses will be a further challenge.

1.3 A summary of our recommendations in this submission

In this submission, we make the following recommendations that flow from the consultation paper.

1. *Maintain a consumer focus:* The AER's draft report tends to reflect the technical nature of the data gathering and analysis of this initiative. We encourage the AER throughout the consultation and feedback for the draft report to continue to ask: "what would this mean to an energy consumer, with or without CER capability?"
2. *Ultimately drive better network utilisation:* While the actions and recommendations from the consultation paper to develop metrics and benchmark export service performance are reasonable, we strongly encourage the AER to see these actions as just the first step in reviewing how DNSPs can effectively be encouraged and rewarded to use their assets efficiently, particularly in the environment of increasing localised, time-dependent two-way power flow, and decreasing daily and seasonal load factors.
3. *Re-frame the DMIS:* There is now an opportunity to revise the approach to the demand management incentive scheme. The DMIS, revised in late 2017, focuses on encouraging DNSPs to resolve a network constraint with non-network options. While the fundamental concept of the scheme remains sound, the AER should consider reframing the scheme to encourage improved load factors and more productive use of existing assets, as customers continue to embrace new energy technologies.

[2] For more information on this rule change, see Access, pricing and incentive arrangements for distributed energy resources | AEMC

4. *Encourage innovation:* Several distributors operate innovation programmes. We recommend encouraging DNSPs to develop and deliver innovative approaches to network efficiency generally, rather than focusing more narrowly on efficiently growing export capacity.
5. *Focus key parameters:* The application of data gathering and investment modelling for export capacity remains complex. In developing the draft data template, we encourage the AER to take a clear view of defining not only *hosting capacity* but also the approach to calculating the *alleviation profile* – a variable that has time-of-day and locational parameters.
6. *A staged approach to data collection:* The rate of uptake of smart meters will impact the rate that appropriate data will become available. Data collection, validation and analysis may take some years, and therefore we support the staged approach to data collection and analysis suggested by some DNSPs.
7. *Consider targeted localities for reporting, not DNSP wide:* Rather than choosing a base year to measure improvement in export performance, it could be more useful to organise performance reports along levels of CER penetration observed across different subregions. Such an approach would help ensure performance improvement could be measured more effectively across subregions with similar CER penetration levels DNSPs could be asked to deliver curtailment data by the level of CER penetration observed in each subregion. This would then allow AER to compare DNSP export improvements over time in subregions where CER penetration is high, and help ensure that DNSPs are investing in network improvement efficiently, in the sense that DNSPs should be primarily investing in export service improvement in subregions where CER penetration is high (rather than investing in export service improvement in subregions where CER penetration is low).

1.4 Maintaining consumer focus

In maintaining consumer focus, we suggest that some of the topics that the AER should include in a holistic more elegant approach to consumer engagement are the following:

- *The willingness of customers to pay for more export capacity*. To properly measure the allocative efficiency of DNSP investment in network hosting capacity, the AER should obtain data on consumers' 'Willingness to Pay' (WTP) for additional increase in network hosting capacity and measure the deadweight loss associated with DNSP underinvestment in these resources.

  Particular attention should be paid to consumers who have currently not invested in CER but may be stimulated to do so as result of improved DNSP export service performance. These are the consumer who stand to benefit from this initiative, yet no data has been collected on how many of these consumers exist, their WTP and what marginal difference the additional incentives will make for their DER investment decisions.

- In terms of changing the approach to benchmarking DNSP performance, the AER should consider how *changing export service performance impacts consumer behaviour and self-consumption.* It may be the case that low export limits could encourage consumer to engage in self-consumption. Export limits effectively increase the incentive for consumers with solar PV to invest in batteries in order to maximise self-consumption. So if self-consumption is an important policy objective, is curtailment really a problem?

  The AER should recognize that there are potential trade-offs in terms of incentivising self-consumption and incentivising improvements export service performance. The AER needs to investigate and outline the conditions in which self-consumption takes a policy over reductions in curtailment. This additional information then help better inform the design of incentives to ensure it is fit for purpose.

1.5 Assessment of the efficiency of initiatives

In considering the efficiency of initiatives to address their efficiency, we suggest that a broad analysis needs to be undertaken, to include:

- Improving utilisation of existing assets (lowest marginal cost for export services);
- Encouraging self-consumption, particularly at times of high solar generation (wider grid stability / local voltage considerations);
- Taking account of the rapid technological change that could change the landscape very quickly (electric vehicles, electrification, etc.); and
- Other relevant matters such as affordability of fuel, and cost of living more generally.

Some of these are inter-related. Increased electrification, uptake of electric vehicles, and increasing use of electricity rather than gas for heating and cooking – all these will to some extent drive increased self-consumption.

Proposed solutions need to be tested against these criteria.

1.6 Consideration of a broader range of consumers

We note in section 4.2 below:

> The AER writes "*customers are guiding the investment decisions of their DNSPs, which are investing in additional network hosting capacity...*" (page 20). The reverse is also likely true, i.e. network hosting capacity is guiding local customer investment in CER, along with associated service expectations among customers.
>
> This should be kept in mind when the AER makes the proposal to collect data on customers that request export capacity (p 32). It is likely that the level of customer requests is endogenously determined by network hosting capacity. The same is true for data on export customer complaints and overvoltage complaints (page 31). Such data only captures those consumers who meet all of the following three requirements.
>
> - They have already invested in CER.
> - They are already using network hosting capacity.
> - They are not satisfied with the existing hosting capacity that is available to them.
>
> This data ignores the segment of consumers who decided not to invest in CER and may have made that decision *because* the level of hosting capacity is too low.
>
> This "missing segment" of customers will benefit the most from future improvements in export service performance as they may begin to enter the market and invest in CER if DNSP hosting capacity is improved in the future. This segment of consumers, which represents the marginal change in the number of consumers investing and self-consuming CER, is one of the key marginal benefits of improving export service performance on which the AER should actually be focusing when deciding on how much to incentivise DNSPs to increase performance.

1.7 An example DNSP trial using community batteries as an approach

We have also included as an Appendix to this report information on trials being undertaken by United Energy in Victoria to install community batteries in its area as a mechanism to "soak up" excess local solar generation that might otherwise have been curtailed due to constraints in the local network. We provide this as an outline case study to illustrate the use of innovative and potentially future mainstream technology to provide

benefits to consumers, rather than doing nothing or undertaking traditional network augmentation. These happen to be a trial of which we are aware. We have not undertaken a comprehensive search for such initiatives, so there may be other similar or different initiatives being undertaken of which we are not aware. We have not studied the evaluation framework or any results that might be emerging from the trial, so we are not endorsing the effectiveness of community batteries. However, we do support and encourage innovation in general that will result in long-term benefits to consumers.

2 Background

The AER Consumer Energy Resources Consumer Challenge Panel (CER-CCP) is pleased to contribute to this next stage of work to support the development of Consumer Energy Resources (CER) in the community. This advice is in response to the AER document '*Incentivising and measuring export services performance – Draft Report – November 2022'* (the **draft report**).[3]

2.1 Review process objectives

The rule change from the AEMC[4] had the primary aim of integrating more Consumer Energy Resources (CER),[5] in particular customer-owned generation, into electricity networks to support the decarbonisation of energy and greater access by energy consumers to distributed energy resources.

The determination notes concerns that without appropriate incentives, DNSPs may tend to underinvest in the network capacity and systems needed to support increasing levels of CER.

a) Existing efficiency schemes could incentivise DNSPs to reduce or defer the expenditure needed to provide an effective export service (clause 47), and

b) There are no performance parameters for export service quality, or the capacity that is available for consumers to export (clause 48).

2.2 Outcomes of the AER's earlier consultation

We note the key aspects of the AER's earlier consultation process in 2022, from which the AER has distilled the following outcomes:

1. The Service Target Performance Incentive Scheme (STPIS) will not initially be extended to export services, on the basis that there is a lack of robust data necessary to implement a standardised scheme that places revenue at risk.

2. The AER will use reputational incentives to encourage DNSPs to improve its delivery of export services. The draft report includes a 'strawman' information request. Data gathering will commence in 2023, with the view of an inaugural report on export services late in 2023.

[3] For more information on the AER project, see Incentivising and measuring export services performance | Australian Energy Regulator (aer.gov.au)

[4] AEMC, Access, pricing and incentive arrangements for distributed energy resources, Rule determination, 12 August 2021

[5] We have chosen to use the term 'Consumer Energy Resources' (CER) in lieu of 'Distributed Energy Resources' (DER) in recognition of the role of consumers in the rapidly growing energy ecosystem. CER includes equipment located on the customer's side of the network connection that is capable of exporting electricity to the grid and/or responding to price and remote-control signals to change export or consumption patterns.

3. The process to introduce a *small-scale incentive scheme* (SSIS) will commence in 2023, and a review of the incentive arrangements for export services in the context of export tariffs and flexible export limits will be undertaken by 2027.
4. The AER will not develop an export service operating environmental factor (OEF), as there is insufficient data available to do so.
5. The AER proposes to initiate a full review of the benchmarking models by 2027.

The AER's draft position is not to review the Distribution Reliability Measures Guidelines (DRMG), demand management incentive scheme (DMIS) and demand management innovation allowance mechanism (DMIAM) as part of this work.

2.3 Consultation paper key issues

The consultation paper seeks views on three issues (work streams):

1. The timing and nature of any incentive arrangements, including developing a small-scale incentive scheme (SSIS);
2. The performance metrics to include in a DNSP export service performance report, and the process for developing the inaugural service performance report; and
3. Develop the options and test the nature of benchmarking to incorporate export services into the AER's annual benchmarking framework.

3 Discussion

3.1 Relate the framework to the wider energy environment

It is important to maintain a customer-centric view, not losing sight of the fundamental objectives of not only connecting more consumer-investment generation but also to promote initiatives to use CER in conjunction with improve network utilisation. After all, CER is not only generation and export; it also includes EV charging (and V2G) and demand response, and hence the role of tariffs and even direct load control.

Any proposal must be tested against 'how will customers access the data, and will it make sense and lead to better decisions?'

3.2 Previous CCP advice remains applicable

We see a risk that DNSPs will choose to invest and increase the value of the asset base rather than seek efficient levels of curtailment.

We do not accept the argument that information such as curtailment ratios and the volume of curtailment across peak is not available or too challenging. The information is critical to understand the quantum of the problem and to track the success of any changes to the incentive scheme. Potential options for resolving data issues include DNSPs acquiring inverter data from third parties, or the AER estimating curtailment volumes based on AEMO's methodology of calculating large-scale variable renewable energy (VRE) curtailment.

We believe that consumers' views and needs can get lost in the regulatory design process. Much of the AER's draft report has considered whether incentive arrangements for DNSPs to provide export services are appropriate. At the same time, as pointed out in our previous submission, the assessment ignores a growing heterogeneity in the types of consumers (non-CER customers, prosumers and gensumer) with their unique set of energy needs.

In the draft report, the AER noted two types of curtailment:

- Static export limits: set a maximum limit on volume of electricity exported to the grid; and
- Voltage-related curtailment prevents customers from exporting electricity to the grid and also prevents customer from self-consuming their own electricity.

Beyond measuring the prevalence of these forms of curtailment, the AER should clearly stipulate what are customer rights, and should prioritise addressing the type of curtailment in which DNSPs engage in practice. Of the two types of curtailment listed above, reductions in voltage-related curtailment should be prioritised by DNSPs, since it inhibits both self-consumption of energy as well as export to the grid. This type of curtailment has a broader negative impact on a wider set of customers (both prosumers and gensumers), relative to static export limits.

The AER should also more explicitly consider how it manages the trade-offs across the interests of non-CER customers and CER customers. While the National Energy Objectives are a useful set of criteria for this, they do not consider the vastly different energy needs of CER and non-CER customers.

4 Questions raised in the draft report

4.1 Incentive review

(a) Extending the STPIS to export services (3.3.1)

Q1 - Do you agree that no amendments to the DRMG are necessary?

CCP – agree. We have many DNSPs proposing CSIS (Customer service schemes that will further marginalise or modify the role of STPIS. We also agree that the averaging nature of STPIS will not identify the needs of the smaller number of customers who export energy.

Q2 - Do you agree with our proposed timeline for a future review of incentive arrangements for export services? What factors may prompt an earlier or later review?

CCP - agree. The AER states "We intend to commence a future review of incentive arrangements for export services ***by*** 2027." We see this as a bit vague, and 4 years seems a long time. We will need to be vigilant that DNSPs don't take the opportunity to overcapitalise in the meantime.

(b) Bespoke incentive schemes (3.3.3)

CCP – agree. We support the view that the AER should frame a set of design principles, similar to those for the CSIS, with the DNSPs having the freedom to design their metrics and approach. Critical to this approach is the need for clear and effective consumer engagement to establish valid expectations and operational objectives.

Q3 - Do you agree that developing a new small-scale incentive scheme is the best way to facilitate DNSPs proposing bespoke incentives? (3.3.3)

CCP – agree. It is a fair compromise between wide and varied data and the need for a level of consistency in definition and scope. It will be necessary to watch for overlap with, say, CESS, and about double rewards.

Note our caveat that any scheme should be consistent with a review of incentives to encourage better network utilisation overall, whether through an extension of the SSIS or linking with the DMIS.

Q4 - What level of revenue at risk (rewards and penalties) is appropriate for a small-scale incentive scheme for export services?

CCP - No response

Q5 - Do you consider that the benefits associated with a small-scale incentive scheme for export services will outweigh the costs of measuring performance and administering the scheme?

CCP - We do not have enough information to comment on this issue.

Q6 - Are there any other factors we should consider for a new small-scale incentive scheme?

Note our caveat that any scheme should be consistent with a review of incentives to encourage better network utilisation overall, whether through an extension of the SSIS or linking with the DMIS.

(c) Allowance and Margin Mechanisms (3.3.4)

Q7 - Do you agree that no amendments to the DMIAM and DMIS are necessary?

CCP – disagree. As we haven noted earlier in this submission, while the DMIS remains valid, the approach should be extended to provide clear incentives to implement forms of demand response incentives to address the falling network utilisation and collapsing load factors. This may not need to be immediately addressed, but a longer-term strategy by the AER to feed into the proposed review of benchmarking would help by reducing the need to change 'mid-stream'.

4.2 Export Service performance reports

(a) Improving the suite of reported data

Q8 - Is there any data we are missing that should be included in our key metrics?

The AER writes "customers are guiding the investment decisions of their DNSPs, which are investing in additional network hosting capacity..." (page 20). The reverse is also likely true, i.e. network hosting capacity is guiding local customer investment in CER, along with associated service expectations among customers.

This should be kept in mind when the AER makes the proposal to collect data on customers that request export capacity (p 32). It is likely that the level of customer requests is endogenously determined by network hosting capacity. The same is true for data on export customer complaints and overvoltage complaints (page 31). Such data only captures those consumers who meet all of the following three requirements.

- They have already invested in CER.
- They are already using network hosting capacity.
- They are not satisfied with the existing hosting capacity that is available to them.

This data ignores the segment of consumers who decided not to invest in CER and may have made that decision *because* the level of hosting capacity is too low.

This "missing segment" of customers will benefit the most from future improvements in export service performance as they may begin to enter the market and invest in CER if DNSP hosting capacity is improved in the future. This segment of consumers, which represents the marginal change in the number of consumers investing and self-consuming CER, is one of the key marginal benefits of improving export service performance on which the AER should actually be focusing when deciding on how much to incentivise DNSPs to increase performance.

To properly measure the allocative efficiency of DNSP investment in network hosting capacity, the AER should obtain data on consumers' 'Willingness to Pay' for additional increase in network hosting capacity and measure the deadweight loss associated with DNSP underinvestment in these resources. As the AER has pointed out, export curtailment cannot be observed directly by DNSPs, as it is generated on the consumer side of the meter, and its estimation requires modelling customer generation.

This data could be directly collected by the AER as part of its effort to improve connection agreement data (discussed page 31). The AER suggests recording customers' "preferred export capacity". In addition to this, it would be useful also to record the customer's willingness to pay for their preferred export capacity.

We also suggest measuring the number of customers going off-grid (e.g. permanent disconnections), i.e. becoming self-sufficient in a region where grid supply is readily available. If networking hosting capacity is low, customers with CER may forego the opportunity to earn revenues from export to the grid, and instead invest in batteries. In regions where hosting capacity is low, we may see an increase in the number of customers deciding to go off grid, especially as electricity storage technology improves and becomes cheaper.

Customers choosing to go off-grid, or to install their own storage solutions, often refer to the desire to be "empowered" as being a driving force in their decision-making. However, it is well-known that customers do not always make economically rational decisions, and even to the extent that customers wish to make rational decisions, they lack the information and data to enable fully rational decision-making.

Q9- Do you foresee any challenges in collecting the new data for the key metrics? Can you identify any additional costs associated with data collection?

The outcome of the current review to the market metering framework will impact the ability for DNSPs to collect appropriate data.

(b) Content to include in the inaugural report

Q10 - Do you agree with the proposed base year for 2020-21 for most metrics and 2022-23 for metrics where data may be less available? Please suggest an achievable timeframe for metrics where the proposed reporting date is not feasible.

In regard to base year selection, the AER has reported a high degree of variability in CER uptake across different network regions. Levels of curtailment are likely to be closely related to the degree of CER uptake present in a region.

Therefore, rather than choosing a base year to measure improvement in export performance, it could be more useful to organise performance reports along levels of CER penetration observed across different subregions. This would help ensure performance improvement could be measured more effectively across subregions with similar CER penetration levels DNSPs could be asked to deliver curtailment data by the level of CER penetration observed in each subregion. This would allow AER to compare DNSP export improvements over time in subregions where CER penetration is high. This would help ensure that DNSPs are investing in network improvement efficiently, in the sense that DNSPs should be primarily investing in export service improvement in subregions where CER penetration is high (rather than investing in export service improvement in subregions where CER penetration is low).

We support the wide coverage.

Q11 - Do you agree with the level of data disaggregation in the strawman information request (typically disaggregated by customer type and feeder classification, with some exceptions)? Please provide your views and reasons if you consider specific data should be disaggregated at a different level to that proposed.

As discussed above, we suggest that data should be disaggregated according to the CER penetration level observed in subregions. This would allow AER to compare DNSP export improvements over time in subregions where CER penetration is high. This would help ensure that DNSPs are investing in network improvement efficiently, in the sense that DNSPs should be primarily investing in export service improvement in subregions where CER penetration is high (rather than investing in export service improvement in subregions where CER penetration is low).

Q12 - Is any of the proposed data ambiguous? If the information request would benefit from additional definitions or specification, please provide your suggestions.

CCP – no response

4.3 Update to benchmarking reports

Q13 - Do you agree that we should not proceed with developing an export services OEF at this time?

CCP – we agree with the paper.

(a) possible impacts of export services on the benchmarking models

Q14 - Do you agree with our draft views summarised in Table 2, including on:

• the potential impacts of export services on the benchmarking models?

• the possible options for addressing these impacts?

• the early 'indicative' views of the materiality of changes to the productivity results of implementing these options?

• key issues that would need to be resolved before changes to the models could be implemented?

In providing your comments on each issue, please include any rationales and evidence in support of your views.

Concerning the Energy Throughput (ETP) variable, the AER notes that an increase in energy generated by household and self-consumed could lower output and decrease the productivity scores of the network. The AER discusses a possible change where the amount of energy self-consumed is added to existing ETP, such that networks in which more energy is produced by customers and self-consumed are considered to be more efficient.

We are concerned to what extent this modification reflects services provided to customers. DNSPs could effectively be rewarded for their customer investment decisions in CER that may be completely unrelated to how efficiently DNSP performance (see the description of gensumers in our previous submission). Such an amendment to the ETP could act as a perverse incentive for DNSPs to reduce export services as lower static export limits could increase self-consumption.

Also, if networking hosting capacity is low, customers with CER may forego the opportunity earning revenues from export to the grid and instead invest in batteries that could foster higher degree of customer self-sufficiency. In regions where hosting capacity is low, we may see an increase in the number of customers deciding to go off grid.

We have similar concerns about how amendments to Ratcheted Maximum Demand reflect service provided to customers by DNSPs.

We support the inclusion of an export service output variable in benchmarking models, provided it is based on negative output and CECV weighted (options 2). This ensures that improvement in export services are in the interested of non-CER customers. We do not support option 1 where export service customer number are used – this is an imprecise approach that ignores the possibility that many CER customers could be experiencing curtailment.

(b) how the benchmarking models could be adjusted to account for export services

Q15 - Do you agree with our revised approach for reviewing if and how benchmarking models can be adjusted to better account for export service, including:

• not further considering the option of excluding exports service inputs from the benchmarking inputs?

• the materiality checks in Table 2 (column 2) proposed to establish the benefit of options to adjust the benchmarking models?

• the final assessment criteria in Table 2 (column 3) proposed to decide whether to proceed with an update or not?

• initiating a full review of the benchmarking models by 2027 to determine the materiality of export service impacts, the best combination of changes to appropriately account for export services, and the feasibility of successfully implementing these changes?

CCP – no specific response, however we agree with the broad approach taken by the AER.

Q16 - For the list of export services data in Box 1 needed to assess materiality of potential export service impacts, considering the uncertainty around which adjustments, if any, may be required and the costs to business of collecting the data:

• what data should we start collecting?

• what data are you able to / not able to begin reporting?

• what data may be feasible to report on in the future?

CCP – no response.

Q17 - For the list of export services data in Box 1 needed to implement possible adjustments to the benchmarking models, considering the uncertainty around which adjustments, if any, may be required and the costs to business of collecting data:

• what data should we start collecting?

• what data are you able to / not able to being reporting?

• what data may be feasible to report on in the future?

CCP – no response.

Q18 - For the Canadian and New Zealand DNSPs currently used in the econometric benchmarking, what are the key issues that would need to be resolved to determine if it were appropriate to continue to use these jurisdictions to update the econometric models for export service impacts? What data and information could we begin to collect to resolve these issues? What alternatives to the Canadian and New Zealand DNSPs could we consider, if their use was not appropriate?

CCP – no response.

Appendix: United Energy community batteries trial

United Energy is implementing a group of projects under the banner of *Electric Avenue*,[6] to rollout pole-mounted[7] neighbourhood batteries on its low voltage network with the aim of helping customers to share power in their communities.

The Electric Avenue Feasibility Study was a collaborative study with 12 community-based partners which identified preferred locations for batteries across many neighbourhoods. It was supported by a grant from the Victorian Government's Neighbourhood Battery Initiative in 2021 and was completed in June 2022. Importantly, it found neighbourhood batteries are very promising. But they are also very complex projects.

The partners worked together to investigate the various uses for batteries, the key factors to consider in their location, design and planning, as well as the commercial considerations for not only their costs and potential revenue streams. For most partners, their interest in neighbourhood batteries is related to community concerns over climate change and their preference was for the batteries to be community-owned. The study therefore prioritised locations where there is a demand related network opportunity, high residential solar penetration, available land and community support.[8]

The trial is partly funded by the Australian Renewable Energy Agency (ARENA).[9]

The first of its kind in Australia, the $10.98 million project will see 40 custom-built batteries manufactured and mounted to electricity poles across United Energy's distribution network. The batteries will operate as a virtual power plant (VPP), providing demand management services, and increasing hosting capacity for rooftop solar.

Each of the 30 kW batteries will be capable of providing at least 2 hours of storage and will be installed at strategic locations across the network. The batteries will be manufactured locally by Thycon in Melbourne's north and mirror the design of existing distribution transformers that are already mounted to poles across United Energy's network in Melbourne's bayside area.

In addition to reducing stress on distribution transformers in times of peak demand, the batteries will also be able to regulate voltage and increase the hosting capacity of solar PV in the local grid, providing benefits to all customers.

United Energy has signed a deal with Simply Energy for the market trading rights of the VPP. When the batteries are not required by United Energy, Simply Energy will operate them to provide wholesale power and frequency control ancillary services (FCAS). This is an example of how DNSPs and retailers can share value streams to provide benefits to customers and the wider energy system.

The project follows a successful pilot by United Energy that saw two battery units installed in early 2020 in the Melbourne suburbs of Black Rock and Highett to demonstrate the feasibility of pole mounted technology.[10]

In order to facilitate the trial, the AER granted United Energy a ring-fencing waiver allowing it to lease the storage capacity of pole-mounted battery units to a retailer partner as part of a trial project, until 30 June 2026.[11]

[6] Electric Avenue - United Energy
[7] Electric Avenue pole-top battery program - United Energy
[8] Electric Avenue Feasibility Study - United Energy
[9] United Energy Low Voltage Battery Trial - Australian Renewable Energy Agency (ARENA)
[10] Transforming the grid with pole-mounted batteries - Australian Renewable Energy Agency (ARENA)
[11] United Energy - Ring-fencing Waiver - October 2020 | Australian Energy Regulator (aer.gov.au)