

ARENA

DER CUSTOMER INSIGHTS: THE CUSTOMER JOURNEY

JULY 2020



Australian Government
Australian Renewable
Energy Agency

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ABOUT THIS REPORT

This report is part of the Australian Renewable Energy Agency (ARENA) 'DER Customer Insights Series' which investigates the experiences of customers involved in twenty ARENA-funded Distributed Energy Resources (DER) projects ('projects'). A summary of the projects that were systematically analysed is in Appendix B

The analysis was undertaken by UTS Institute for Sustainable Futures, who prepared the report in conjunction with ARENA.

The Institute for Sustainable Futures (ISF) is an interdisciplinary research and consulting organisation at the University of Technology Sydney. ISF has been setting global benchmarks since 1997 in helping governments, organisations, businesses and communities achieve change towards sustainable futures. For further information visit: www.isf.uts.edu.au

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Disclaimer

The authors have used all due care and skill to ensure the material is accurate as at the date of this report. ISF and the authors do not accept any responsibility for any loss that may arise by anyone relying upon its contents.

1.0

EXECUTIVE SUMMARY

This report is part of the ARENA 'DER Customer Insights Series' which investigates the experiences of customers involved in ARENA-funded DER projects. Customer insights were drawn and analysed from almost one-hundred reports arising from twenty of ARENA's DER projects.

This report features insights drawn from the customer journey. The DER customer journey was assessed across all twenty projects as four separate stages, documenting approaches, experiences, issues and key lessons. These four stages were defined as:

- › **Engagement and acquisition:** involving all steps in the lead up to product's installation, including all awareness raising up to the point of the financial transaction and signing of contracts.
- › **Installation:** involving all the steps directly related to the installation, including any pre-installation site visit.
- › **Operation and maintenance:** covers all ongoing activities related to the operation of the DER system (firmware and hardware), including any scheduled or unscheduled maintenance.
- › **Retention:** the post-installation phase that ensures customers continue to be satisfied with their product and service, leading to on-going engagement and the customer becoming an important advocate of DER.

THE DER CUSTOMER JOURNEY ILLUSTRATES THE STEPS THAT CUSTOMERS GO THROUGH IN ENGAGING WITH A DER PRODUCT OR RELATED SERVICE.

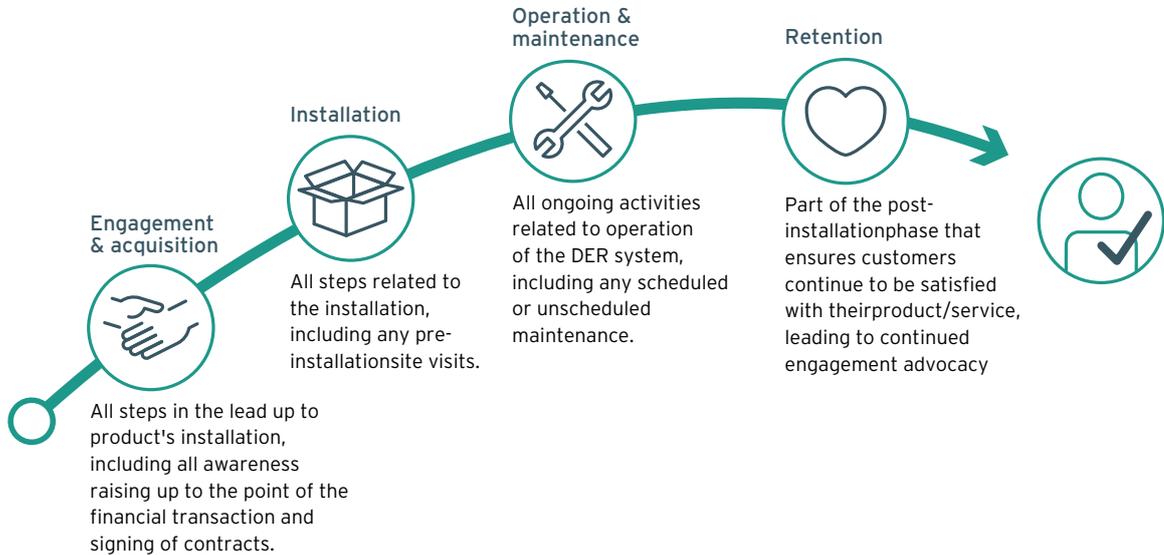


Figure 1: The Customer Journey

Note: The customer journey depicted here takes into account the product lifecycle excluding the end-of-life phase. While an important aspect to consider in terms of sustainability, this was outside the scope of this project.

Characterising the customer journey can facilitate better understanding of the customer for the organisations involved in the projects, and lead to continual improvement of the value proposition. From analysing the insights derived along the DER customer journey, 6 key 'ingredients' were identified that contribute to creating a happy DER customer:

- 1. Customer knowledge & understanding:** know who your customers are and the values that drive them.
- 2. Clear value proposition:** the customer value proposition and the benefits are clearly articulated.
- 3. Smooth customer experience:** Provided throughout the entire customer journey.
- 4. Market-ready product:** the DER products are of sufficient commercial maturity.
- 5. 'Super installers':** Installation is a critical moment - enlist well-trained, knowledgeable installers who know their customers.
- 6. Earned trust:** trust is critical in public acceptance and advocacy. This should be earned along the entire customer journey.

Ultimately this will help accelerate the rate at which DER is deployed by the sector and maximise the potential benefits to customers and the energy system.

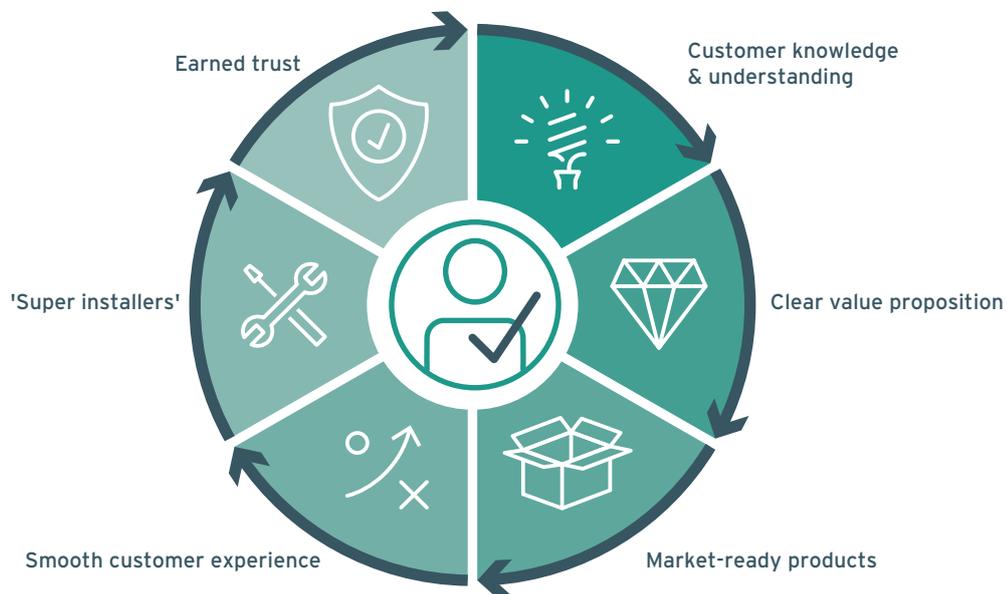


Figure 2: Six key ingredients to a happy DER customer.

2.0

INTRODUCTION

2.1 THE DER CUSTOMER JOURNEY

Characterising and critically assessing the journey that DER customers go through can facilitate better understanding of the customer, while leading to continual improvement for organisations involved in this sector. It can also lead to better customer outcomes and help maximise the benefits of DER to both customers and to the energy system. A customer journey illustrates the steps that customers go through in engaging with a product or service.

For ARENA's DER Customer Insight Series, this encompasses the phases from when a customer may become first aware of a DER product or service offering, through the transactional purchase, and beyond as part of an ongoing relationship that is the result of the continued servicing of that customer.

Many of the ARENA projects emphasised the need for providing a smooth customer experience along the entire customer journey. As part of this, listening to - and acting on - customer feedback was seen as essential for ensuring continual improvement of the customer experience across the entire journey.

For the purposes of this Customer Insights Series, the DER customer journey has been simplified into four main steps. The customer journey was assessed across these four separate stages for twenty ARENA DER projects, documenting approaches, experiences, issues and key lessons.

The following sections address steps one to four in the customer journey detailed in Figure 1. Each section contains more details of each step, resulting from the analysis of almost one-hundred reports that were generated by twenty DER projects funded by ARENA and its industry partners.

ENGAGEMENT AND ACQUISITION

INSTALLATION

OPERATION AND MAINTENANCE

RETENTION

3.0

ENGAGEMENT AND ACQUISITION

The acquisition and engagement step in the customer journey involves all steps prior to installation of the DER product. This includes any awareness raising on the part of the provider via marketing and communications, as well as the customer acquisition process itself.

3.1 ENGAGEMENT

A wide range of engagement methods were employed by project partners in the twenty ARENA-funded projects analysed. Engagement activities were undertaken through a variety of online and offline methods in order to reach potential customers and/or the targeted communities.

3.1.1 ENGAGEMENT METHODS

The variety of the engagement methods used across the different projects is detailed in the table below.

TABLE 2: OFFLINE AND ONLINE ENGAGEMENT METHODS EMPLOYED BY ARENA-FUNDED PROJECT PARTNERS

OFFLINE	ONLINE
Direct mail	Email campaigns
Public / town hall meetings	Project partner websites
Community workshops	Other websites (including news)
Home visits	Social media
Marketing material, banners and signage	Media releases
Traditional media (radio/tv/newspapers)	Webinars
Surveys	Surveys
Community groups / Local champions ¹	



Figure 4: Synergy's community battery signage from Alkimos Beach.

The marketing signage was designed to create a buzz in the community with simple but enticing messaging for the community battery installation.

Source: Synergy

¹ A 'Local Champion' is an individual, group, or organisation who is trusted among the target customer group/community and supports the offer/project.

3.1.2 KEY CONSIDERATIONS FOR SUCCESSFUL ENGAGEMENT

A number of considerations emerged as key when it came to successful engagement activities. These were drawn from across the different projects and were a result of existing knowledge and expertise that partners brought to the projects, as well from lessons learned through from the project engagement.



3.1.3 SEEKING A LOCAL CHAMPION IN GEOGRAPHICALLY-FOCUSSED PROJECTS

Identifying and engaging a local champion was considered critical where a project had a geographic focus, such as a specific town, area, or housing development. The critical step for these types of projects is to identify trusted agents as early as possible in a project and prior to any public communication taking place.

Projects that had a particularly strong geographic focus and were assessed as part of this research were:

- > **UTS and partners** 'Networks Renewed' Virtual Power Plant (VPP) trial that was centred on Collombatti in NSW and Yackandandah in Victoria. <https://arena.gov.au/projects/networks-renewed/>
- > **Synergy and partners** community battery trial that took place at a new residential development at Alkimos Beach, WA. <https://arena.gov.au/knowledge-bank/alkimos-beach-energy-storage-trial-customer-insights-2019/>
- > **ANU and partners** 'CONSORT Battery Trial' that was undertaken on Bruny Island, Tasmania. <https://arena.gov.au/projects/consumer-energy-systems-providing-cost-effective-grid-support-consort/>
- > **United Energy** and partners residential solar storage trial that focussed on a number of network constrained locations east of Melbourne CBD. <https://arena.gov.au/projects/united-energy-distribution-demand-response/>

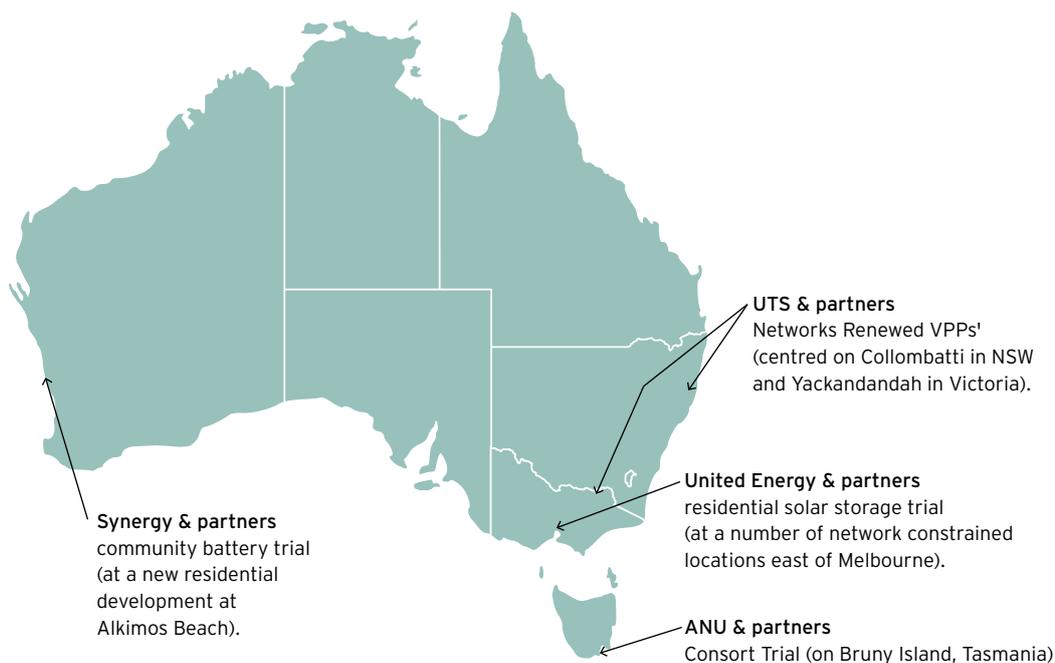


Figure 5: Map of ARENA-funded DER projects with a strong geographic focus.

These projects were focussed on a particular development, town, or area in order to address an identified electricity network constraint at that location.

3.2 ACQUISITION

Acquisition is the phase when the customer considers the offer. Key activities of the customer would include:

- › **Undertaking their own research** through accessing online and offline information, engaging with employees of the project partners (in-person, on the phone, or via email), and speaking with friends, family, or neighbours (word-of-mouth).
- › **Facilitating any pre-installation suitability assessment** and site inspections.
- › **Participating in the actual transaction and purchase itself**, which is initiated through review and signing of a contract, paying the supplier, and agreeing an installation and activation date.

3.2.1 THE CHALLENGE OF CUSTOMER ACQUISITION

Customer acquisition was challenging for the majority of DER projects studied. This typically resulted in the process taking longer than expected, or recruiting less customers than was originally targeted. Those that had more success with this part of the customer journey had:

- › **Undertook detailed customer research in advance** to better understand the needs of their target customers².
- › **Targeted communities that they were already familiar and/or had high-levels of engagement** on energy issues already (such as the ANU-led Bruny Island trial, or the UTS-led Yackandandah trial).
- › **More conservative** customer acquisition targets

CASE STUDY: THE CONSORT BRUNY ISLAND BATTERY TRIAL

Background	Bruny Island is a Tasmanian island and popular tourist destination. It comprises farms and small townships comprising suburban housing. While most of the island has mains supplied electricity, the electricity distribution network must deliver power to the widely dispersed population that can pose challenges for reliability and resilience.
Project Details	The aim of the Bruny Island Battery Trial was to use residential solar PV and batteries in the homes of 34 of the island's residents to reduce reliance on diesel generators. The project investigated whether solar PV and batteries could manage household energy demand while also supporting the island's electricity network. Consumers and their experiences were an important focus for the trial.
The Customer Journey	Following initial awareness raising through various channels (e.g. community and industry forums, and up to at least 50 media items across various types), interested participants were required to submit an expression of interest, which helped select those that met a basic criteria for trial participation. Those expressions of interest that qualified were then entered into a random ballot. Those selected were offered the opportunity to participate in the trial and were allowed to select an installer from a pre-selected list (intended to mimic a "real-world situation").

3.2.2 ENGAGEMENT & ACQUISITION: WHAT WORKED, AND WHY?

Engagement and acquisition of customers represents a key stage in the customer journey. Below summarises what worked in particular, and why.

- › **Thorough planning** of all communication and engagement - ensuring that messaging was consistent and avoiding confusion or misinformation spreading.
- › **Careful consideration of which partner's branding to use** - the more familiar, well trusted brand will have the most positive impact on acquisition.
- › **Understanding which communication channel works best** for different types of customers - all customers are different and making assumptions about preferred methods of communication can mean missing engagement with a large section of the market.
- › **Ensuring that all partners and key stakeholders have the relevant and up-to-date information** (e.g. scripted descriptions of the project, proposition and benefits, and answers to frequently asked questions) - this ensures that all partners are prepared to deliver accurate and consistent information and messaging, avoiding customer confusion.
- › **Updating information in response to developments as part of a constant feedback loop** - this ensures that the customer journey and their experience is continually improved.
- › **Increasing publicity** through launch events, community forums/events, and word of mouth were found to be an important way to acquire customers.

² For more information see ARENA's DER Customer Insights Report on Customer Values.

- › **Trusted platforms** (such as the websites of government agencies) were found to be an important source of information potential customers turned to.

Publicity surrounding launch events, community forums/events, and word of mouth were found to be an important way to acquire customers.

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Personalised email communication was found to be the preferred method of communication in some (but not all) projects, although different response rates could be expected depending on when emails were sent. For example, in GreenSync's deX Consumer Insights Report³, 8am on a Sunday was found to work best compared with evening or weekday mailings. This has implications for increasing the marketing leads into sales.

- › **Working with local champions** who are trusted within the community are particularly important in certain cases - they play a major role in how a project is perceived and accepted so their buy-in is crucial.
- › **Providing detailed information on benefits** (e.g. savings) in communication material (including optimal sizing for a customer's specific system, and the likely impact on their bills under different scenarios) provided transparency to the customer on the likely benefits.

Focusing on a simple proposition and avoiding jargon

In one trial, in response to feedback from customers, the term 'smart' was removed from the description of their offer. Instead this was replaced with a description of a simple value proposition based on a specific financial return over a fixed time period (i.e. earn \$5,000 over 2 years). This resulted in an increase in the customer acquisition rate.

- › **Minimising the number of customer steps** for registering interest and signing up - fewer steps and a simplified sales process contributes to a lower attrition rate during the customer acquisition process.
- › **Timely and effective follow-up of leads** - a fast, well managed sales process contributes to a lower attrition rate during the customer acquisition process.
- › **Early determination of customer eligibility** - reduces customer acquisition costs, and minimises the time investment (and subsequent disappointment) of potential customers.
- › **Ownership models tailored to the target customer** group - early adopters (who were well-represented within the projects) highly valued their energy independence so did not find third-party ownership models appealing.

3.2.3 ENGAGEMENT & ACQUISITION: WHAT DIDN'T WORK, AND WHY?

Initial approaches to engagement and acquisition weren't always found to be successful. Below summarises what didn't work in particular, and why.

- › Complex messaging or providing too many options - leading to customers not understanding the offer and the benefits to them resulting in low acquisition rates.

Too many options are daunting for customers who preferred simple brochures and products

ANU's Consort Trial found that providing a suite of choices of technology types and billing options was daunting for customers. Other trials also found that simple brochures that focused on the benefits were most effective, and "simple products" were preferred by customers.

- › Slow and/or cumbersome acquisition processes (e.g. delays due to network connection approvals, or where there was a reliance on postal delivery in areas where this could be slow or infrequently checked) - leading to a lower rate of customer acquisition.
- › An irregular or impersonal point of contact - these barriers to effective communication led to lower levels of trust, the spread of misunderstandings or misinformation, and lower rates of customer acquisition.

³ <https://arena.gov.au/assets/2019/03/dex-consumer-insights-report.pdf>

3.2.4 ASSESSING CUSTOMER SUITABILITY

During the acquisition and engagement process, it is critical to identify as quickly as possible the suitability of a prospective DER customer for installation (i.e. the next stage in the customer journey). For example, having enough roof space for solar PV or having a suitable location to house a battery.

Several projects conducted thorough eligibility checks and pre-inspections before attempting installation to speed up customer recruitment while minimising customer acquisition costs. A shared sentiment across all projects was that installation was often more complex, time consuming, and costly than expected.

If the customer is deemed suitable, and the transaction proceeds, the 'potential customer' becomes an 'actual customer' and their journey advances into the Installation phase.

4.0

INSTALLATION

The installation of any DER product is a key moment with lasting impacts on the customer and their view of the technology and the provider. This phase involves all the steps directly related to the installation, including any pre-installation site visits.

If the installation is not planned well, it can be a source of frustration for both installers and customers with multiple communications and repeat visits needed.

This step involves direct contact with the customer, with whom the installer may or may not have been in contact before (depending on if they were involved in the engagement or acquisition process). A number of projects emphasised strongly the need to enlist well-trained, knowledgeable installers who deeply understand customers, their requirements, and the product.



Figure 6: Typical customer installations from United Energy's residential solar and storage program.

United Energy reviewed a number of technology providers for their trial before selecting a preferred installer to undertake the work.

Source: United Energy

4.1.1 INSTALLATION: WHAT WORKED, AND WHY?

Below lists what worked when it came to the installation phase, and the reasons considered being behind this.

- › **Including installers in the project design phase** - early involvement helped get installers' buy-in to the project and its overarching objectives. It is likely to also have had a positive impact on improved cost estimation, planning, and management of certain risks.
- › **Investing resources in the installation process** (e.g. pre-install site inspections, technical support for installers, knowledge transfer) - this helped ensure higher quality installations with fewer return visits to remedy issues.
- › Comprehensive training of installers including upskilling and embracing their capacity to be 'knowledge brokers' - customers look to their installers for advice and are willing to place their trust in them. Therefore, they have a major influence on the overall customer experience.
- › **Quick, effective installation with a single site visit** - this minimises cost and time for the installer/provider, while leading to a more positive experience for the customer.

-
- › **Providing an early indication to customers if they are likely to need non-standard installations** (longer, more costly, more intrusive) - managing the expectations of customers will avoid the chance of a negative customer experience.
 - › **Providing firm pricing options with no hidden costs** - adding to a more positive customer experience when the costs are transparent.
 - › **Planning for internet connectivity issues** (e.g. installers were able to confirm 3/4G coverage at a customer's home prior to visiting the home for the installation. This was the case with the "Reposit Box" that was deployed across many sites in a number of the projects) - this would avoid potential frustration, additional costs, and delays for the customer and installer.

Internet connectivity could pose a challenge but could be mitigated with forward planning

Some projects were aware already of the challenges to set up devices and maintain internet connectivity on home networks. Gathering internet provider and connection details prior to a site visit helped identify and address issues in advance of the installer visit.

Customers (or their family members/co-inhabitants) with the lowest level of technical expertise should be expected and be able to be catered for. DER technologies should ideally be able to cope with frequent interruptions in internet connectivity.

- › **Survey customer emotions before and after installation** - this can give an indication of any deeper issues or problems that have emerged in the customer journey up to and including the crucial installation phase.
- › **Timely, effective response to any issues** - leading to a more positive customer experience.

4.1.2 INSTALLATION: WHAT DIDN'T WORK, AND WHY?

- › **Underestimating the time, complexity and cost in planning the installation of a new technology** - in particular the electrical infrastructure and physical layout of homes can vary widely. This can mean additional work, from laying concrete plinths and upgrading switchboards, to fixing cracked roof tiles and trimming surrounding vegetation to reduce shading.

Many homes needed some form of upgrade to the infrastructure to accommodate a residential battery

For AGL's South Australian VPP project, 78% of sites needed a variation due to certain characteristics of the home. This was due to the requirements of installing the battery storage system. This had implications for the amount of work, cost, and complexity of the installation.

- › **A drawn-out, "diffuse" process** that was slow with multiple visits required can lead to negative sentiments, such as frustration, anxiety and anger. Repeat visits to fix technical issues were a common issue.
- › **Cashflow for installers was an issue that delayed installs significantly.** This is particularly true when most installs needed some rectification and installers were only paid when these issues were rectified
- › **Pre-suitability checks** are in general a useful tool for the installation phase but issues can still arise - they can improve process efficiency, minimise costs, and address any safety issues in advance. However, even when they are employed, unexpected issues can still lead to lower than expected customer acquisition rates.

Pre-suitability checks can be a useful tool but unforeseen issues can still arise

Synergy's Alkimos Beach project found a large number of their target customers weren't eligible as they had reversible air conditioning units that didn't meet with the required standard for demand response control.

- › **Over-stretched supply chains or those covering large areas** can be slower to respond. Addressing customer issues quickly can be a major challenge where installers cover a large area, for example in regional areas with lower population densities.

Stringent management of supply chains critical to a positive customer experience

In 2015, Ergon Energy tested a hybrid energy system with 33 customers in Toowoomba, Cannonvale, and Townsville. The network found that “stringent management of supply chains was critical” to a positive consumer experience as well as a cost-effective service.

- › **Variable installer quality**, including varying levels of service, ability, knowledge and technical competence - leading to a poor experience for some customers.
- › **Poor aesthetics** of installed equipment - not fitting with an existing home's look and feel affected the satisfaction levels of customers.

Aesthetics as a barrier to DER uptake

CSIRO's study, 'Householder interest and active participation in the solar distributed energy market', found that aesthetics were a barrier to DER uptake, particularly around the size of batteries and where they would need to be located. New industry standards require that batteries be mounted on a “non-combustible surface” (often a cement block) and extra cement sheeting may be needed to line the wall where there is a “habitable room” on the other side.

5.0

OPERATION AND MAINTENANCE

This step involves all activities related to the scheduled and unscheduled operation and maintenance (O&M) of the DER equipment over its lifetime. This can include interaction with both the hardware and firmware.

Most customers involved in ARENA-funded DER projects received at least one additional home visit after installation and this is a key stage of the customer journey. However, there was not the same wealth of insights that were found in the previous stages. One reason may have been because the projects were focused on reporting outcomes on customer recruitment/acquisition, installation and early operation. Another may have been because positive experiences of O&M in the first 1-2 years are less likely to be as reported compared to negative ones (there is a base-level expectation that the product will work).

Most projects acknowledged the importance of providing timely and effective support to customers. Keeping communication channels open is a way to ensure integrity of the installed technology and build trust. As with installation, customers cared about having access to well-trained and knowledgeable personnel.



Figure 7: The LO3 mobile app for DER customers.

The app provided customers in LO3's trial with an overview of the electricity being generated by their DER, as well as choosing what devices to enact for demand response.

Source: LO3

5.1.1 OPERATION & MAINTENANCE: WHAT WORKED, AND WHY?

Below provides a summary of what was found to have worked with regards to the operational and maintenance stage of the customer journey, as well as the reasons why.

- › **Effective, fast follow ups to customer issues** - this was core to achieving a higher level of customer satisfaction.
- › **Providing detailed and accessible technical documentation to the customer** - allowing them to either troubleshoot issues to solve common problems, or understand when external support was needed.
- › **Comprehensive technical and customer engagement training** for installers and support service personnel to reduce issues for the customer further down the line.
- › **Keeping online resources (e.g. product manuals, user guides) current and up to date** to resolve common issues more easily and quickly.
- › **Providing clear, end-to-end processes** for the entire project to all project partners, stakeholders and subcontractors in the supply chain to ensure a smooth process for the customer.

Half of post-installation issues avoided for one project by investing in the installation process

Ergon's Residential Solar PV + Battery (Hybrid Energy Service) Pilot found that 50% of post-installation issues could be avoided with a combination of better documentation, training, and through the establishment of end-to-end processes that were easy for contractors to follow.

5.1.2 OPERATION & MAINTENANCE: WHAT DIDN'T WORK, AND WHY?

Below provides a summary of what was found to have not worked with regards to the operational and maintenance stage of the customer journey, as well as the reasons why.

- › **Gaps in processes and a lack of documentation** that included a description of the roles and responsibilities of each actor in the supply chain - this could lead to confusion and increase in post-installation issues.
- › **Lack of training for key customer-facing roles** including installers (who may need to return to the premises to remedy issues) and support service personnel (who will have to deal with customer calls to field queries and complaints) - this would lead to a poorer customer service and experience.
- › **Issues with DER functionality**, particularly for inverter connectivity that was disrupted (e.g. by network voltage issues). These interruptions would then impact on the customer economics and their perception of the trial and technology.

Some operational issues were linked to wider energy system challenges

AGL's Virtual Power Plant trial found that around an eighth of the energy storage systems in its project experienced high voltages that would lead to disconnection from the grid. This meant that they would become unavailable assets within the AGL fleet at times of high grid voltage.

These high voltages can be exacerbated by low electricity demand and high solar generation (e.g. during the middle of the day), and is a challenge for Australia's network businesses to remedy. Another of ARENA's projects (the UTS-led Networks Renewed) was funded to look at whether offering network support services through a customer's connected DER could address voltage issues. The trial proved that both solar and batteries can support network voltage in this way.

- › **Issues or discomfort with third-party ownership or control of the DER** - For some customers in the DER trials, greater control and independence over their energy were important motivators, sometimes even more important than the financial benefits on offer.

A majority of customers in some trials valued control over any additional financial benefits

One project said only 16% of their customers were comfortable with this, although it was felt that this was addressable if framed in a different way.

Another said that it expected that if consumers were remunerated well-enough, then there would be greater ease over their battery systems being controlled. Instead, it was found customers put a much higher premium on back-up power than was assumed and were willing to forego the additional financial benefits to maintain control.

6.0

RETENTION

This step involves the post-installation phase that ensures customers continue to be satisfied with their product and service, leading to on-going engagement and the customer becoming an important advocate of DER.

This includes any potential interactions between the customer and their system. For example, controlling their device, visiting an online portal/smart phone app to review energy usage and any savings made, proactively contacting the supplier/operator/installer of their DER system (and having queries or complaints answered quickly and effectively), or passively receiving alerts (via email, text, or a mobile phone app).

The implementation of ongoing communication plans as part of a retention strategy can contribute to maintaining a generally positive sentiment towards the technologies and the providers.

The twenty ARENA-funded DER projects were mainly demonstrations that sought to show how the effective use of distributed energy resources can help Australia transition to a secure and reliable grid with a high share of renewables. These were typically innovative applications of technologies and/or business models that took place over a defined period of time. As would be expected, the project reports that were generated contained less customer insights on the retention phase. Some individual findings are reported below.

A CUSTOMER PERSPECTIVE ON ARENA DER TRIAL PARTICIPATION

DER Sharon from Osbornes Flat in Yackandandah shares her perspective on why it was great to be involved in an ARENA-funded DER trial.

Yackandandah is a small former gold mining town in North East Victoria. In 2014, it set itself a target of 100% renewables for the town by 2022. Totally Renewable Yackandandah is the local community group run by volunteers that has established a roadmap for achieving this target. For this reason, it is an ideal community to target for DER projects.

As well as the location for one of the ARENA-funded Networks Renewed trials, it also has several microgrids funded by various agencies including the Victorian Government that seeks to help it towards its 2022 target.



Source: UTS

6.1.1 RETENTION: WHAT WORKED, AND WHY?

The retention phase is the final stage in the customer journey. Below provides a summary of what in particular worked and the reasons why.

- › **Ongoing certainty was preferred**, even if greater savings were on offer - for some customers in the DER trials, greater control and independence over their energy were more important motivators.

Lower capped earnings were preferred to higher variable ones

One project found that a \$2 a day offer with a capped price proved more popular even if it was shown that they could be better off on a variable rate.

- › **Ongoing and planned engagement** for the years beyond installation that the project is likely to last (e.g. community forums and events, online forums and/or social media 'communities') - directed at customer retention and building advocacy.
- › **Influencing changes in consumer behaviour** - from participating in the trials, customers decided on moving to a time-of-use tariff. This showed customers were able to adapt their behavior as required.
- › **Offering ongoing support** - helping customers optimise their DER over time, noting that some customers wish to "set and forget", while others prefer regular notifications. This ongoing support was able to improve the chances of retaining those customers for whom this was an important requirement.

Customer knowledge and understanding will help inform engagement for retention

Possessing a good understanding of the customers is also important for understanding how different types of customers prefer to engage and be engaged with. This may require the development of different models for customers depending on how they prefer to engage with their DER asset.

For example, regular notifications would assist the 'optimisers' get most value out of their DER assets but switching off of the notifications would be the preference of the 'set-and-forget' type customers.

6.1.2 RETENTION: WHAT DIDN'T WORK, AND WHY?

Below provides a summary of what was found to be less successful with the retention phase of the customer journey and the reasons why.

- › **Complex pricing structures or value propositions that change over time** - leading to confusion and disengagement
- › **Designing optimisation algorithms without customer participation** - leads to systems that lack the ability to adapt to the operational schedules and demands of the different types of customers.

A need for greater consumer input into the design and refinement of algorithms for DER control

A number of trials found the need for greater consumer input in designing and improving the algorithms that can return positive outcomes for both supplier and customer. There is a role for machine learning and artificial intelligence if it can deliver better ongoing outcomes for customers.

- › **Not planning for legacy** - it is unclear how customers will be supported at the conclusion of each trial, which may affect the long-term trust and interest in future DER projects.

7.0

CONCLUSION

The customer journey can facilitate better understanding and lead to continual improvement for the organisations involved in the projects. It can also lead to better customer outcomes and help maximise the benefits of DER to them and to the energy system.

A wealth of customer insights are contained within the reports that are generated by the ARENA-funded DER projects. This has been condensed into seven broad key findings, as well as six key ingredients for a happy DER customer. This can serve to help inform future ARENA-funded DER projects, as well as be used by other organisations with interests in DER related products or services.

7.1 THE SIX KEY INGREDIENTS TO A HAPPY DER CUSTOMER

Characterising and critically assessing the journey DER customers go through will facilitate better understanding for the organisations involved in these projects, encouraging continual improvement as well as lead to a better outcome for customers. Ultimately this will help accelerate the rate at which DER is deployed and maximise the potential benefits to customers and the energy system.

The six key ingredients were formed based on the customer insights analysed from the almost one-hundred reports generated by twenty ARENA-funded DER projects. These are summarised below:

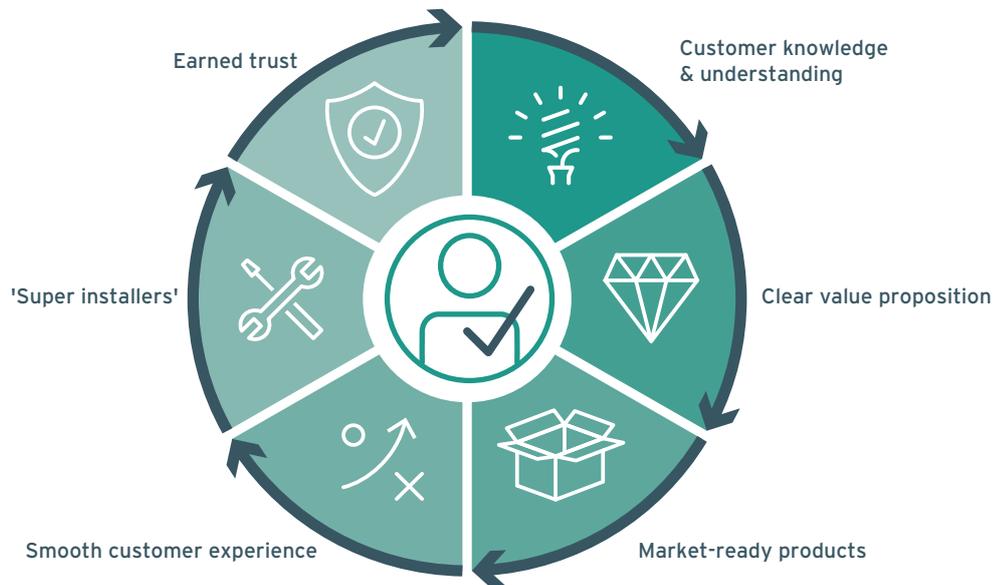


Figure 6: Key ingredients to a happy DER customer.

CUSTOMER KNOWLEDGE & UNDERSTANDING

Know who your customers are and the values that drive them - through customer segmentation, customer research, and customer feedback. Tailor customer proposition and engagement accordingly.

CLEAR VALUE PROPOSITION

The customer value proposition and the benefits are clearly articulated for the customer. Communicate the cost and benefit in simple and transparent way that appeals to the individual customer and their values. Cost is a cross cutting motivator so ensure the financial aspects are aligned with the customer's values.

MARKET-READY PRODUCTS

The product works and is ready for being deployed with customers. This means a certain level of commercial maturity has been reached. The supply chain knows how to install and how to overcome common installation and operation issues quickly and effectively.

SMOOTH CUSTOMER EXPERIENCE

Provide a smooth experience along the entire customer journey, with a key and knowledgeable point of contact for when support is needed. This means minimizing touch points as part of the acquisition process as well as making the installation as short and non-intrusive as possible.

'SUPER INSTALLERS'

Installation is a critical moment - enlist well-trained, knowledgeable installers who understand customers and the products being installed. Involve them in the overall project design process as early as possible, train them well, and provide sufficient resources for the installation phase.

EARNED TRUST

Trust is critical in public acceptance and advocacy. This may be earned along the entire customer journey through regular and appropriate communication and engagement with customers and other stakeholders (such as community groups or local government) Seek to work with partners who are also trusted.

8.0

APPENDICES

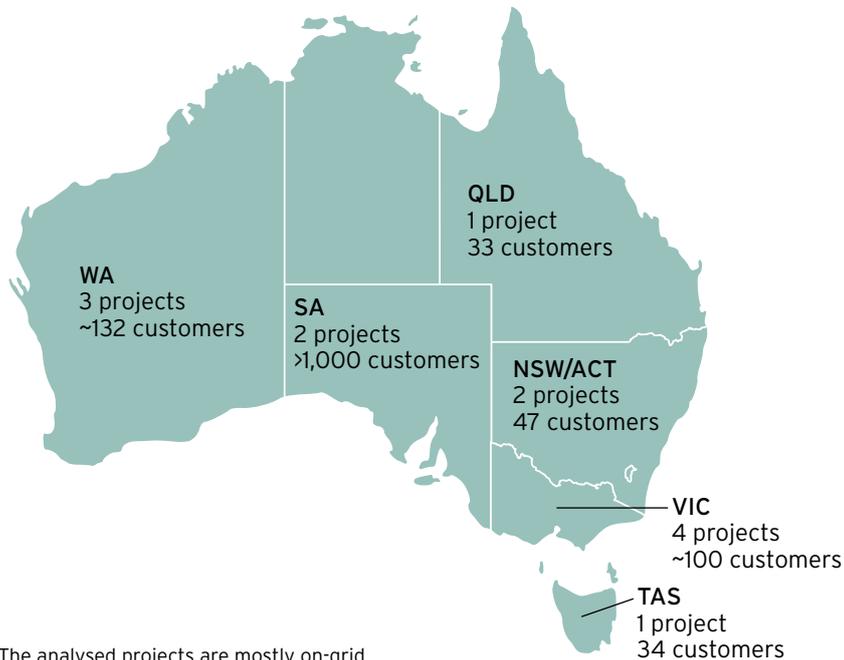
8.1 APPENDIX A: SUMMARY OF KEY LESSONS

What worked	The Customer Journey	What didn't work
<ul style="list-style-type: none"> › Undertaking detailed customer research and segmentation. › Carefully planned, regular communication and engagement. › Communicating your offer, options, and pricing simply. › Providing customers with a single, accessible, point of contact. › Responding and addressing frequently asked questions quickly and effectively. › Maintaining online resources that are relevant, accessible, and up-to-date. › Creating excitement of the offer with the target customer group / community. › Working with trusted partners / local champions. › Established and smooth process for acquiring customers 	<p style="text-align: center;">Engagement & Acquisition</p> <p>This stage involves all steps in the lead up to product's installation, including all awareness raising up to the point of the financial transaction and signing of contracts.</p>	<ul style="list-style-type: none"> › Complex messaging. › Providing too many options. › Slow and/or cumbersome acquisition processes. › An irregular or impersonal point of contact.
<ul style="list-style-type: none"> › Including installers in the design phase of the main project. › Investing suitable resources in the installation process. › Providing comprehensive training and upskilling of installers. › Quick, effective, non-intrusive installation with a single site visit. › Consideration of home aesthetics. › Transparency over final installation requirements and cost. › Plan ahead for common pitfalls, such as internet connectivity issues where required. › Responding and addressing any installation issues quickly and effectively. › Customer research before and after installation to identify any concerns early. 	<p style="text-align: center;">Installation</p> <p>This stage involves all the steps directly related to the installation, including any pre-installation site visit.</p>	<ul style="list-style-type: none"> › Underestimating the time, complexity and cost. › A slow, drawn-out and "diffuse" process requiring multiple site visits. › Over-stretched supply chains that can be slow to respond. › Variable installer quality, some offering lower levels of service, ability, knowledge and technical competence. › Poor aesthetics of installed equipment that doesn't fit with an existing home's look and feel.

What worked	The Customer Journey	What didn't work
<ul style="list-style-type: none"> › Responding and addressing any operational issues quickly and effectively. › Providing accessible technical information and updated FAQs to allow customer troubleshooting. › Comprehensive technical and customer engagement training for installers and support service personnel. › Providing all project partners, stakeholders and subcontractors in the supply chain with clear, end to end processes. 	<p>Operation and Maintenance</p> <p>This stage covers all ongoing activities related to the operation of the DER system (firmware and hardware), including any scheduled or unscheduled maintenance.</p>	<ul style="list-style-type: none"> › Poorly managed processes, and undefined supply chain partner roles and responsibilities. › Lack of training for customer-facing roles. › Intermittent issues with DER functionality and continuity of operation. › Issues and discomfort with third-party ownership / control of the DER.
<ul style="list-style-type: none"> › Certainty of financial costs and returns preferred to variable rates, even if those variable rates offer greater benefit. › Ongoing and planned engagement directed at customer retention and advocacy › Changing consumer behaviour, such as through time-of-use tariffs. › Tailored engagement depending on customer preferences, such as through different degrees of control offered for optimising their DER. 	<p>Retention</p> <p>This stage covers the post-installation phase that ensures customers continue to be satisfied with their product and service.</p>	<ul style="list-style-type: none"> › Complex pricing structures or value propositions that change over time. › Designing optimisation algorithms without customer participation or acknowledging different the types of customers. › Not planning for legacy and how customers will be supported at the conclusion of each trial.

8.2 APPENDIX B: THE COHORT OF ARENA-FUNDED DER PROJECTS AND THEIR CUSTOMERS

19 ARENA projects* across almost all states and territories hosted ARENA-funded projects. The demonstration projects involved over 1,300 customers who chose to have DER systems installed in their homes.



The analysed projects are mostly on-grid residential solar and storage trials therefore it is important to consider the nuances of other contexts when applying these findings.
Presentation to ARENA | Institute for Sustainable Futures

*13 demonstration projects and 6 non-demonstration projects (including feasibility studies, standards development and market testing).

PROJECT			DESCRIPTION
Solar and Storage Trial at Alkimos Beach	Lendlease Communities, Synergy , DevelopmentWA	2014	The Solar and Storage Trial at Alkimos Beach Residential Development project involves developing, deploying and testing the commercial feasibility of a new energy retail model. It will combine community scale battery storage, high penetration rooftop solar PV and energy management within a new residential development at Alkimos Beach, Western Australia.
Latrobe Valley Microgrid Feasibility Study	LO3 Energy	2018	The Latrobe Valley Microgrid Feasibility Study will assess the viability of creating a local energy marketplace for dairy farms, residential participants and commercial/industrial customers in the Latrobe Valley. Participants will sell excess energy generation, demand response capabilities and network support services to improve integration of Distributed Energy Resources, such as rooftop solar. The Project will incorporate PV, storage, demand response and LO3 Energy's Exergy platform to deliver an optimal distributed energy model in the region.
Indra Monash Smart City	Indra Australia Pty Ltd	2018	The Indra Monash Smart City will demonstrate how smart and renewable technologies can be integrated at the Monash University Clayton embedded network to maintain power quality and test market driven responses and business models. Indra's Active Grid Management (InGRID AGM) platform will provide real-time monitoring and control over the grid-connected assets, and be optimised to add value to customers, market participants and the electricity grid.
Intelligent Storage for Australia's Grid	Reposit Power Pty Ltd	2014	The Intelligent Storage for Australia's Grid project involves piloting GridCredits, a battery storage control module that allows consumers to monitor electricity usage and access their solar power overnight and at peak times. Reposit will offer the 'GridCredits System' to volunteer households in Canberra. The pilot will demonstrate the value of smart storage and also increase the understanding of how residential solar and energy storage systems can operate in Australia's electricity grid. The project has the potential to increase the uptake of rooftop solar and may allow more renewable energy to be connected to the grid.

PROJECT		DESCRIPTION	
Distributed Energy Market	Australian Photovoltaic Insitutute (APVI)	2012	The Distributed Energy Market project assessed a range of ways in which customers and electricity utilities might participate in a distributed energy market.
Higher Renewable Penetration in New Land & Housing Developments	Brookfield Energy Australia Pty Ltd	2015	This project aims to explore the commercial viability and impact of renewable energy for large new housing developments with off-grid microgrids. Brookfield Energy Australia, through Flow Systems, will work with Siemens, Kinesis and CSIRO to determine whether renewables, battery storage and enabling technologies can reliably and cost effectively power new suburbs.
CONSORT Bruny Island Battery Trial	ANU, TasNetworks, Reposit Power Pty Ltd, University of Sydney, University of Tasmania	2016	The CONSORT Bruny Island Battery Trial successfully developed and demonstrated an innovative automated control platform that enables consumers with battery systems to provide support to a constrained electricity network. It continues to do so in a way that is of maximum benefit to both the consumer and the network. At the heart of CONSORT is a platform called Network Aware Coordination (NAC). The NAC's primary task is to automatically coordinate household energy systems (in a non intrusive way) enabling them to adhere to and alleviate network constraints. The trial effectively demonstrated the use of this approach to manage high renewable penetration and other constraints at a much lower cost than is conventionally possible.
Increasing the Uptake of Solar PV in Strata Residential Developments	Curtin University, LandCorp, Electricity Networks Cooperation, CRC for Low Carbon Living, City of Freemantle, Balance Utility Solutions	2016	The Increasing the Uptake of Solar PV in Strata Residential Developments project will develop governance models to allow shared solar photovoltaics (PV), battery and monitoring systems to be used in medium density apartments. The governance models will be tested at 50 units of the White Gum Valley development in Perth. The governance models developed will examine the shared benefits, risks and costs between developers, owners, tenants, strata bodies and utilities. The models will also include the energy system design, billing, legal addendums for dwelling purchasers and dwelling leases. The financial aspects of the governance models will be studied, tested and demonstrated in three different strata lot developments. The models developed are expected to be adaptable and scalable to suit different development types.
Networks Renewed	UTS, Reposit Power Pty Ltd, Essential Energy, United Energy, AusNet Services, APVI	2016	The Networks Renewed project investigated pathways to increase the amount of renewable energy in Australia by paving the way for small-scale solar photovoltaic (PV) and battery storage installations to improve the quality and reliability of electricity in Australia's distribution networks. Two demonstrations focussing on voltage management, recruited 90 customers in three locations across NSW and Victoria under new commercial models for network-related businesses. A key outcome of the project is a practical understanding of the commercial value of new smart inverter technology.
AGL Virtual Power Plant (VPP)	AGL Energy Limited	2017	The AGL Virtual Power Plant is a world-leading prototype of a virtual power plants (VPP) created by installing and connecting a large number of solar battery storage systems across 1000 residential and business premises in Adelaide, South Australia, to be managed by a cloud-based control system. The batteries will be able to 'talk' to each other through a cloud-based platform using smart controls, forming a connected system that will be able to operate as a 5 MW solar power plant.
Peak Demand Reduction using Solar and Storage	United Energy	2017	The Peak Demand Reduction using Solar and Storage project has successfully demonstrated a reduction in peak demand as an alternative solution for deferring network augmentation. United Energy: developed operating modes for the systems including automated control algorithms; and investigated business models that could facilitate the deployment of storage to address network issues. The outcomes from the dispatch events were complemented by ongoing market research in order to facilitate the provision of non-network solutions to system planners where network constraints are identified, and to feed into ongoing asset strategy development regarding the application of energy storage in a network context.
Trialling a New Residential Solar PV and Battery Model	Ergon Energy, Sunverge, SunPower	2015	The Trialling a New Residential Solar PV and Battery Model project involves Queensland energy provider Ergon Retail undertaking a pilot demonstration to test a commercial and operational model for providing grid-connected solar photovoltaic (PV) and battery storage systems to residential customers. The demonstration will involve installing and testing 33 systems in Cannonvale, Toowoomba and Townsville.

PROJECT		DESCRIPTION	
Carnarvon Distributed Energy Resources (DER) trials	Horizon Power	2017	This project aims to resolve the technical, operational and transitional barriers to a high penetration DER business future. It also aims to leverage Horizon Power's experience and pioneering use of distributed energy storage to build capabilities in the management and optimisation of high penetration renewable energy generation in remote microgrids. Held over three years, the Distributed Energy Resource (DER) trials will test distributed energy systems through a variety of behind-the-meter energy systems tests, with the aim of better understanding how to manage the variability of renewable energy and its impact on the network, and ultimately increasing PV system penetration throughout our remote networks.
Battery Storage System Performance Standard	DNV-GL	2018	The Battery Storage System Performance Standard project aims to produce a proposed Australian Battery Energy Storage System (BESS) Performance Standard (ABPS) for batteries connected to residential or small-scale commercial solar photovoltaic (PV) systems. The intention is for this proposed ABPS to be submitted to the Standards Australia standard creation process. A Guideline based on the proposed ABPS will also be produced for use by industry stakeholders prior to a final ABPS being agreed and finalised via Standards Australia.
Simply Energy VPP	Simply Energy, GreenSync, SAPN, AEMO, Tesla, Flextronics	2018	The Simply Energy Virtual Power Plant (VPP) project will deliver up to 1200 Tesla Powerwall 2 batteries to Adelaide households. This represents 6 MW of residential energy storage, while a further 2 MW of demand response capacity will be deployed across 10 commercial businesses.
Solar Analytics: Monitoring for Better Energy Outcomes	Solar Analytics Pty Ltd, APVI	2016	The project aims to accelerate deployment of an Australian-developed technology designed to monitor the performance of residential solar PV systems and provide low cost analytics and fault diagnostics. The technology compares energy generation against performance expectations, reporting system data back to the residential user, while also identifying faults and providing corrective actions.
Decentralised Energy Exchange (deX)	GreenSync, United Energy, ANU, Mojo Power, ACT Environmental Planning Directorate, Victorian DELWP, ActewAGL	2017	Decentralised Energy Exchange (deX) is a prototype online marketplace that will provide a way for households and businesses with rooftop solar and battery storage systems to be paid for allowing electricity network businesses to access their rooftop solar and stored electricity to strengthen the grid.
Building the world's first consumer owned solar retail and services company	DC Power Co	2018	DC Power Co. is a disruptive business planning to launch the world's first solar focused, customer owned energy retailer and services company. Taking account of the 1.8m+ Australian homes with rooftop solar that are ripe for disruption in the current energy retail market, the DC Power Co. model proposes to deliver: <ul style="list-style-type: none"> › A disruptive electricity retail solution focused on solar prosumers › Customer engagement through ownership › Enhanced savings by divorcing profits from consumption

Further information is available at
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