

ARENA Demand Response Trial: Knowledge Sharing Project performance report

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The views expressed herein are not necessarily the views of the Australian Government, and the Australian Government does not accept responsibility for any information or advice contained herein.

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1. Report summary

This report provides an overview of the demand response (“DR”) provided by Enel X and its customers across New South Wales and Victoria for the ARENA Demand Response Trial, and knowledge sharing pertaining to the following period: **1 June 2018 to 30 November 2018 (Program period #2)**

Consistent with Enel X’s previous knowledge sharing reports, this report:

- describes Enel X’s technology used to provide DR, including the software and hardware solutions used to monitor customer load and remotely initiate curtailment
- provides a summary of Enel X’s DR business model and the pricing structures and incentives for recruiting customers
- Enel X lists the various industries from which Enel X has recruited its commercial and industrial (C&I) customers. A full list of customer types and their general locations is in **Appendix A**.

This report also sets out the knowledge and experiences gained by Enel X during the reporting period, including:

- Enel X details of the tests undertaken in April (‘winter 2018 test’) and November (‘summer 2018/19 test’) for Program Period #2
- Summary of lessons learnt from the operation of the project during this period, including Enel X’s reflections on the reduced baseline demand across its portfolio during the April 2018 audits and winter months, which led to the requirement to recruit additional customer sites as backfill to provide an operational buffer in the event of dispatch
- High-level comparison of dispatch performance between customer sites that have agreed to Enel X automated curtailment vs. customer sites that require manual on-site curtailment for dispatch events.

Finally, the report also looks at the ramp rates at key customer sites across its portfolios, both prior to and following dispatch events. This section will also compare ramp rates at automated sites vs. manual-curtailment sites, which may assist with the reviews currently underway to consider in-market demand response as part of the NEM Dispatch.

Note: the report is structured and labelled such that many section and subsection headers are verbatim prompts excerpted from the *Knowledge Sharing Agreement* (“KSA”) Enel X and ARENA agreed to. Use of these headers helps to ensure that Enel X has addressed all topics and included all information specified in the KSA.

2. Overview of demand response being provided

In accordance with its contracts with ARENA and AEMO, Enel X has developed a 20 MW reserve in New South Wales and a 30 MW reserve in Victoria.

The combined 50 MW DR portfolio is comprised of C&I energy users who have agreed to safely reduce their electricity consumption during DR events when dispatched by AEMO. These C&I

energy users (Enel X's customers) are capable of implementing load curtailment within 10 minutes of receiving dispatch instructions from Enel X indicating that a DR event is commencing.

In the first six months following program start on 1 December 2017, Enel X recruited an additional 5.2 MW (approx. 17%) in firm capacity for its VIC portfolio. Since then, Enel X has recruited an additional 2.9 MW for VIC (total 8.1 MW), as well as 2.5 MW for its NSW portfolio. This presents a total 10.6 MW (or 21% of the 50 MW combined portfolio) of additional capacity recruited since program start. As noted in the previous Knowledge Sharing Report, Enel X planned to build a 20% buffer for its portfolio.

The intention of this is to provide an operating buffer in the event of unplanned unavailability at customers' sites, and to offset lower operational demand for seasonal loads such as cold storage facilities. Enel X is confident that its expanded portfolio will be able to perform strongly for all upcoming test and dispatch events for the remainder of the three-year trial program.

Summary of technology being used to provide DR

As stated in previous Knowledge Sharing Reports, Enel X has developed individual Energy Reduction Plans ("ERPs") in consultation with each of its customers – these are stored in Enel X's customer database and accessible to customers via the Enel X desktop application.

Each ERP includes the following three-step process:

- 1) Enel X will notify customers that a DR event has been called.
- 2) Customer to confirm phone and e-mail notifications.
- 3) Customer sites to commence load reduction processes (E.g. safely reduce energy usage, shut down equipment, and processing units etc.) **Note: this part of the ERP is customised to each customer's facility.**

Enel X has installed its own metering technology at customer sites to monitor the facility's demand and facilitate effective demand response. The Enel X Site Server (ESS) is a highly secure, low-latency communications gateway for energy management and demand response applications.

During DR events, an "event performance dashboard" becomes available in the Enel X Demand Response portal, which Enel X's staff and customers can use to assess the near real-time "performance" of each facility: the instantaneous and average load reduced from its adjusted baseline – superimposed against a "reduction target".

Additionally, a portion of the sites has been equipped with control equipment that allows Enel X to remotely initiate a load reduction. Automated DR capability is provided via the ESS relay control module, providing a clean contact state change at both the start and end of the dispatch period. Customers integrate this signal into their Programmable Load Control and/or Building Management Systems to provide a safe, controlled initiation of load curtailment.

Enel X works closely with customers that are able to automate their energy reduction plans, with the controls tested prior to full customer enrolment. As participation by these customers in DR events is automated and pre-authorised, the customer will simply receive notification from Enel X that a DR event is taking place.

Business model and pricing structures/incentives employed to recruit capacity and activate load reduction

Enel X presented customers with the following pricing structures/incentives to participate in the trial:

- Availability payments – based on customers' daily availability for responding to a DR event. The units for these payments are \$/MW/year.
- Energy payments – based on the energy delivered/reduced per interval during a DR event. The units for these payments are \$/MWh.

Availability payments cover the costs of searching for, contracting, commissioning, account managing, and ensuring continuous availability of each customer facility. Energy payments are intended to cover the customer's short run marginal costs including the costs of additional resources associated with load curtailment during DR events.

Payment terms with customers are negotiated on a case-by-case basis, depending on:

- individual operational requirements
- size of loads, cost of reducing load
- magnitude and complexity of required on-site technology and controls work
- opportunity cost of other energy management strategies,
- and other commercial considerations.

Since the previous Knowledge Sharing Report was published in June 2018, Enel X has signed up a new multi-site customer in the retail sector. These customer sites form an important part of our VIC portfolio, helping to offset lower baseline demand from other customers during non-summer months and providing fast dispatch during peak demand periods.

Unlike most/all other customers in our portfolio, this customer agreed to forgo availability payments and instead opt for higher Energy Payments during dispatch events. This arrangement reflected the relatively low setup costs of enrolling in the program, due to existing Building Management Systems (BMS) designed to manage and reduce energy usage across all sites. However, the higher energy payment rates are designed cover the customer's relatively higher short run marginal costs associated with load curtailment during DR events, and to cover the costs of resourcing the program particularly during summer months.

Customer types and geographic location

Enel X's initial approach was to target C&I customers in industries where it had prior experience developing flexible loads in other markets. This included businesses such as chemical manufacturers, metalworkers, and cold storage and refrigeration facilities.

Following program commencement, Enel X has been able to identify and contract new customers in industries in which we had less prior experience. This included industries such as fruit and tree nut growing, product manufacturing, as well as HVAC customers in the tertiary education sector

and more recently, the retail space. Enel X has also recently recruited a new customer in the Paper Product Manufacturing industry, a first for Enel X in this program. This customer performed well above expectations during the recent November test event for NSW, and will be an important part of the portfolio for future DR events.

All new customer loads will provide an invaluable resource as part of our VIC and NSW portfolios because they help to offset lower baseline demand from seasonal customers (such as cold storage facilities) in the winter months. This provides Enel X with a more diversified DR customer portfolio, which is not heavily reliant on seasonal HVAC loads, and ensures Enel X is not reliant on any single industry to deliver its aggregated reserve.

The newly recruited customers from the aforementioned industries have demonstrated an ability to successfully participate in this ARENA DR program, with strong results in the recent November test events.

To date, Enel X has recruited a range of C&I customers from the following industry sectors:

Table 1: Commercial and Industrial customer segments

Commercial	Industrial
Agricultural Product Wholesaling	Basic Chemical Manufacturing
Building Structure Services	Basic Metal Manufacturing
Fruit and Tree Nut Growing	Fruit and Vegetable Processing
Other Goods Wholesaling	Grain Mill and Cereal Product Manufacturing
Tertiary Education	Meat and Meat Product Manufacturing
Warehousing and Storage Services	Waste Treatment, Disposal & Remediation Services
<i>New customer segment: Retail</i>	Wood Product Manufacturing
	<i>New customer segment: Paper Product Manufacturing</i>

With the recent additions to our VIC and NSW portfolios, the percentage split (in terms of MW capacity) is now approximately 30% commercial, and 70% industrial. This is in line with the forecast guidance Enel X provided to ARENA in its application to the Demand Response Competitive Round.

In terms of overall customer numbers enrolled in the program, the percentage split is 50% commercial and 50% industrial.

The charts below provide an illustration of the various industry segments that make up our VIC and NSW portfolios (by MW).

Figure 1. VIC customer segments by percentage of portfolio

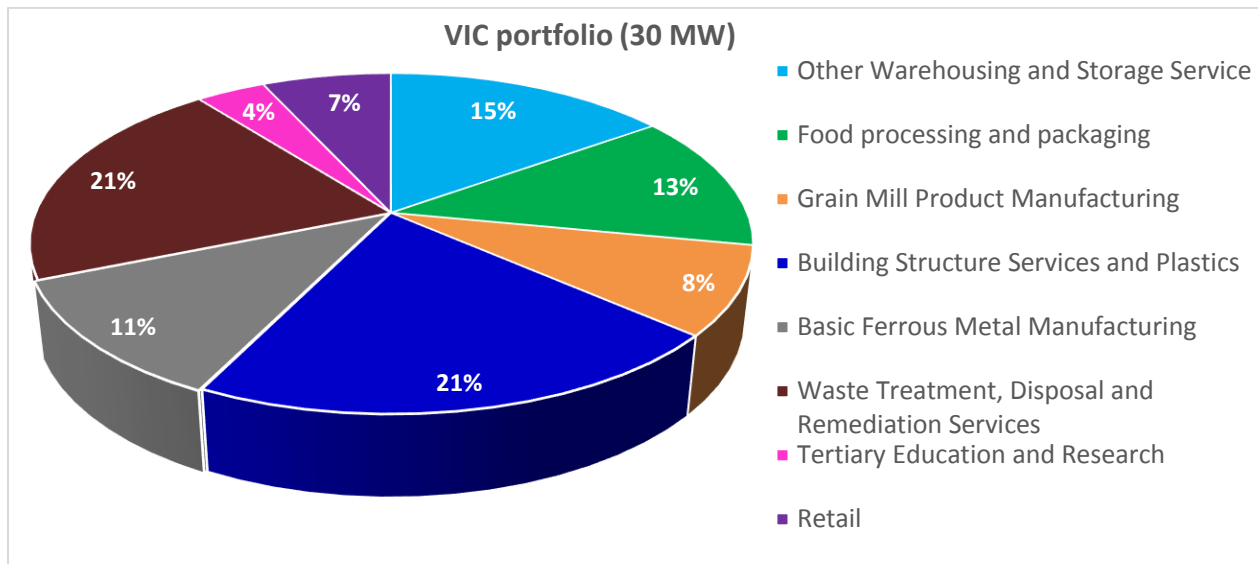
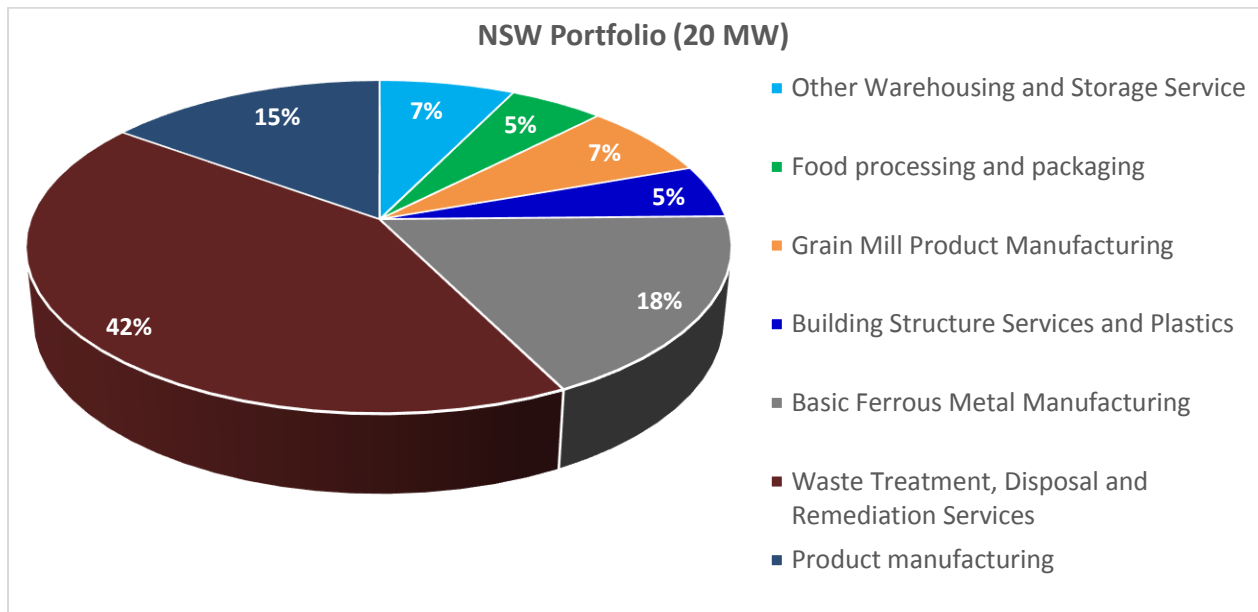


Figure 2. NSW customer segments by percentage of portfolio



As noted above Enel X has recruited an additional 2.9 MW in VIC and 2.5 MW in NSW over the past six months. For VIC, the new retail customer sites were mainly spread out across the state in the outer suburbs, while for NSW the new paper product-manufacturing site is located in the outer south west of Sydney. This is consistent with the rest of the industry segments in the respective portfolios.

In VIC, most commercial customers are located in the outer suburbs of Melbourne, such as Campbellfield, Clyde and Laverton, and others in regional cities such as Shepparton. The industrial customers are mainly located in the inner Melbourne suburbs such as Altona and Kensington. In NSW, both commercial and industrial customers are mainly located in the outer western suburbs of Sydney between Parramatta and Penrith.

A more detailed table outlining each customer's general location and industry type is provided in **Appendix A**.

3. Analysis of performance based on six-monthly test data and any real activation data

As per Program Period 1, there were no real emergency DR events called by AEMO in this program period, so no real activation data is available.

As noted in the previous report, Enel X responded to two Invitation to Tender (ITT) notices issued by AEMO for the NSW region on 7 June and 8 June 2018, as part of the Short Notice Reliability and Emergency Reserve Trader (SN RERT) mechanism. However, on both occasions AEMO did not end up dispatching Enel X's reserves. There were no other ITT notices issued by AEMO during Program Period 2 (1 June 2018 to 30 November 2018).

However, Enel X is required to test its VIC and NSW portfolios every six months – once in the two months prior to June, and once in the two months prior to December each year.

The reserve quantities to be tested are:

- 20 MW in NSW
- 30 MW in VIC.

As required by the ARENA funding agreements, Enel X requested testing of its portfolios in mid-April prior to Program Period 2, and again in late November prior to Program Period 3.

April 2018 test events

Enel X struggled with lower baseline demand across both portfolios for the April test events, largely due to a reduction in energy usage from cold storage sites and customers with seasonal demand, as well as lower HVAC consumption across all sites.

For VIC, the expected impact from lower baseline demand was expected to be substantial given Cold Storage & Logistics customers make up 22% of the portfolio, while seasonal customers form 12% (in total one third of Enel X's 30 MW reserve in VIC).

However, the lower baseline demand was partially offset by Enel X being able to recruit an additional 5.2 MW of capacity after program commencement on 1 December. This included a customer with 2.8 MW of capacity across three sites that were enrolled in the program just prior to April. Overall, despite the lower baseline demand from cold storage and seasonal customers, the VIC portfolio ended up performing stronger than expected during the April test event.

For NSW, Enel X was unable to recruit any additional capacity prior to test events in April. Unfortunately, the mild weather conditions and various operational issues at customer sites did not help the lower baselines on the day of the test. Two customers had unexpected operational issues on-site, another large customer had planned maintenance which continued for longer than expected. All experienced substantially reduced demand within the adjustment period prior to the event, thereby reducing the amount of demand response during the event intervals.

Overall portfolio performance was lower than expected, which reinforced the need for Enel X to develop a 10-20% "buffer" for the NSW portfolio to offset lower baseline demand and unplanned outages at customer sites for future dispatch events.

November 2018 test events

VIC portfolio (30 MW)

Customer's expected baseline demand in November 2018 was higher than in April 2018 and the subsequent winter months due to increased energy consumption from HVAC, particularly in NSW which experienced warmer weather earlier than Victoria, but also increased consumption from cold storage sites.

However, the November demand volumes were still lower than baseline demand levels observed during the previous summer period that included the first test events in January 2018 for program commissioning.

Enel X was advised of the following issues at several customer sites just prior to the week of the planned test event in VIC.

- One large metal manufacturing site unfortunately experienced a fire hazard a few weeks prior to the test week, and subsequently advised of a shut down for all operations until mid-December.
- A water services customer advised they would not be able to partake in the 2-hour test event due to aeration issues on site, which were not expected to be resolved until early December at earliest (since the test event, this has been advised to early January).
- A small manufacturing customer advised that due to operational and commercial priorities leading up to Christmas, it would not be able to participate in the test event.

Together, this equated to approximately 4.5 MW of capacity that would no longer be available to Enel X for the planned November test event. Further to this, baseline demand at seasonal sites (fruit and vegetable growing customers) were still tracking at lower than summer levels, which equated to approximately 1.5 MW of reduced DR capacity.

Fortunately, with Enel X having recruited an additional 8.1 MW of capacity for its 30 MW portfolio in VIC, this operating buffer was able to more than offset the 6 MW in "lost" capacity. Combined with warmer than expected conditions on the day of the test event, the VIC portfolio performed very strongly and above expectations.

NSW portfolio (20 MW)

In NSW, baseline demand across the portfolio had been tracking strongly throughout October and early November due to warmer weather conditions. In addition to this, all customer sites confirmed they were ready and able to participate in any test or dispatch event, with no issues reported.

As previously mentioned, Enel X had also recruited an additional 2.5 MW of additional capacity earlier in the program period to provide a buffer, especially given the operational challenges experienced in the April test event. Combined with the favourable weather conditions on the test day, including warm overnight and daytime temperatures, the NSW portfolio performed strongly with several individual customers performing much better than expected.

4. Summary of most recent lessons learnt from the development and operation of the project

Participant reflections on the functioning of the DR market and the impact of market incentive structures on performance

Overall, the business model for the ARENA DR Program is effective for customers with a predictable load that can be safely and quickly curtailed.

As noted earlier, Enel X recently recruited a new retail customer that has agreed to forgo availability payments and instead opt for higher energy payments during dispatch events. In consideration of AEMO's recently stated preference for RERT contracts with lower capacity payments,¹ Enel X may consider proposing alternative incentive structures, depending on the customer type and industry segment, for future DR programs.

As per the previous report, several customers advised the Easter holiday period was also likely to impact on availability of DR. Enel X's experience with the periods surrounding public holidays suggests the impact is two-fold.

Reduced operations around extended public holiday periods

Firstly, several Commercial & Industrial businesses advised they tend to reduce operations and energy consumption during the days just prior to and following public holidays such as the Good Friday / Easter Monday period. This is a result of both lower demand from their customers, combined with planned leave for staff during this holiday period.

Enel X observed aggregated demand for the three working days both prior to, and following, the Good Friday / Easter Monday long weekend in 2018. Interestingly, Enel X found:

- In VIC – during the three working days preceding the long weekend, aggregate demand was approximately 3.8 MW (or 8%) lower than baseline demand, while in the following three days, demand was approximately 0.7 MW (1%) above baseline levels.
- In NSW – in the three preceding days, aggregate demand was approximately 3.1 MW (or 13%) above baseline demand for that period, while in the three days following, demand dropped 4.2 MW (or 18%) below baseline levels.

As observed in VIC, this suggests some customers may reduce operational activity just prior to long weekends, accounting for reduced customer demand and/or planned leave arrangements. The same customers would ramp up operations following the holiday period, including making up for reduced operations during the previous week.

In contrast as observed in NSW, other customers may ramp up production levels just prior to long weekends, including customers who experience higher demand for finished goods normally consumed during the holiday period. The same customers would reduction operational activity following the long weekend, perhaps allowing for planned staff leave following increased operations and workload in the previous week.

¹ AEMO RERT Information Session, Monday 13 August 2018.

The findings are based on Enel X’s customer portfolios in VIC (30 MW) and NSW (20 MW), and are reflective of the individual customers in those portfolios. As these portfolios represent an extremely small sample of the broader industry segments, it would not be accurate to assume the same behaviour applies for those industry segments as a whole.

Other commercial considerations leading up to extended holiday periods

Secondly, and as suggested in the previous report, some customers indicated they had other commercial considerations during the holiday period. One manufacturing customer in VIC advised it could not participate in the planned DR test in April because of commercial pressures to meet customer orders by fixed deadlines.

Similarly, a food-manufacturing customer in NSW noted it would not be able to provide the expected level of demand response for the DR test, because of high levels of customer demand for their products. In their words, “it’s our busiest time of year, the weeks leading up to Christmas”.

Some customers noted they might not be able to provide any or as much DR due to other commercial considerations during certain times of year. For example, one customer provided an example of contractual requirements to fulfil large customer orders for Christmas, and avoiding contractual or financial penalties.

Participant lessons learnt on hardware and software technology requirements to support firm delivery of DR

Enel X’s reflections on the challenges associated with installing hardware and software at customer sites prior to program start date are set out in the previous knowledge sharing report.

Following the most recent test events in November, Enel X undertook a review of dispatch performance in terms of the volume of DR provided compared to expected DR capacity, as it did for the April test event. This looked at the average performance of all customer sites that agreed to automated curtailment from Enel X compared with those customer sites utilising manual on-site curtailment for dispatch events.

The results from the April 2018 and November 2018 tests are presented below for VIC and NSW.

Figure 3. Automated vs. Manual curtailment sites (VIC)

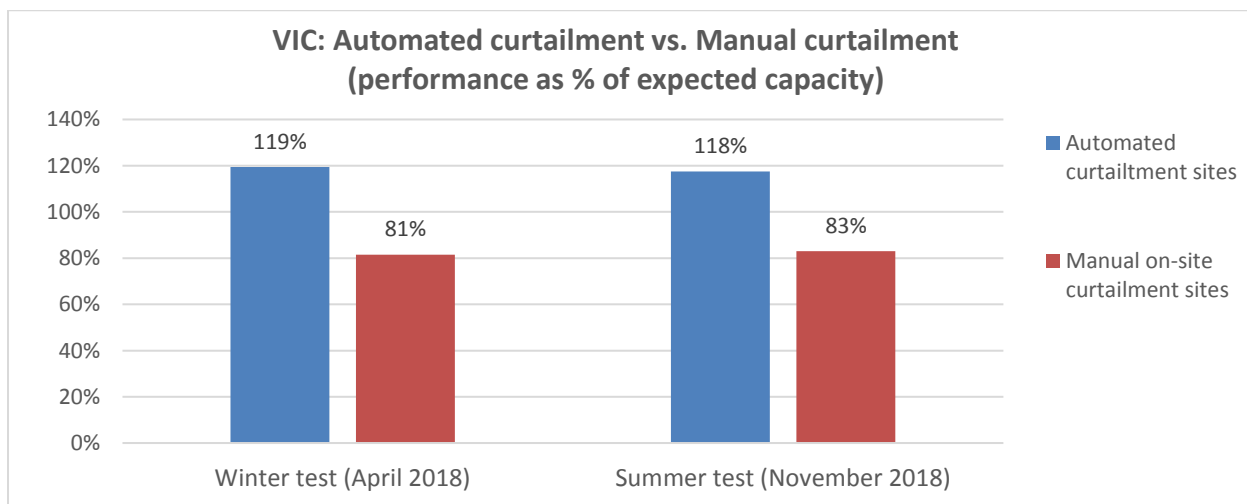
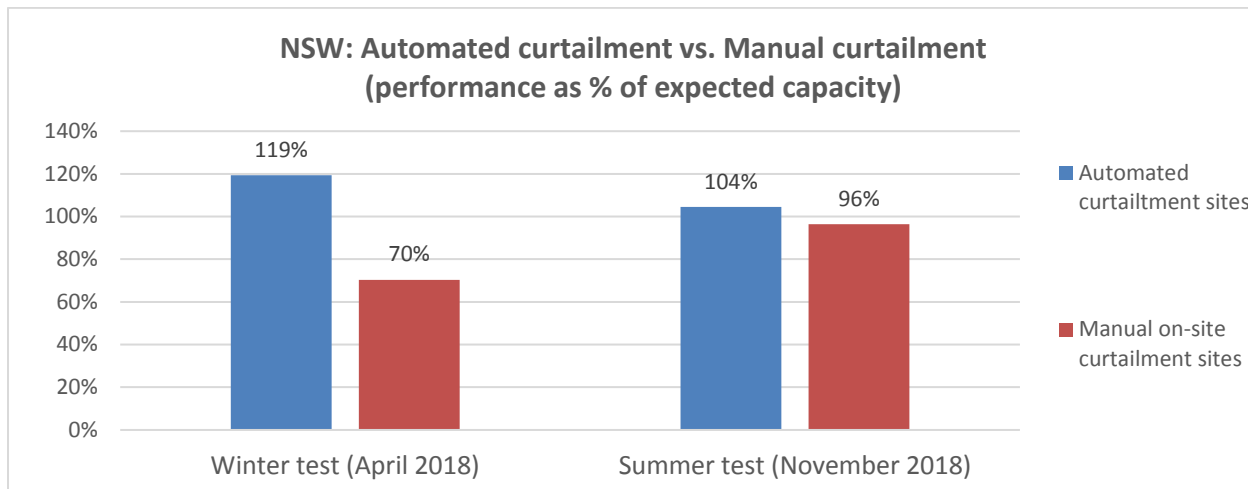


Figure 4. Automated vs. Manual curtailment sites (NSW)



As illustrated in both charts, Enel X found there was clear difference in performance depending on whether the customer opted for an Enel X-automated curtailment or chose to use manual on-site curtailment. In addition to this, customers who had recently had automated-curtailment enabled for their site loads mentioned to Enel X that this was preferred, as it meant fewer actions to take on their end, and also lead to higher dispatch performance for the test event.

Moving forward Enel X will continue to advocate for customers to allow automated curtailment of loads, but is cognisant of the fact many customers may be reluctant to accept this due to operational considerations and concerns about ceding control of their loads to an aggregator. Enel X understands other demand response aggregators face the same challenges when recruiting customers to provide DR.

Participant lessons learnt on DR business model design

In reiterating Enel X's earlier position, the philosophy underpinning the RERT framework² is clear and well intentioned – that is, resources are only eligible for RERT if they are not already providing wholesale (supply or demand) response by actively managing generation/load in response to energy spot prices³. In this way, RERT resources (which are paid outside the wholesale market) can be thought of as truly "additional" resources.

Enel X has continued to focus on recruiting new DR customers and 10.6 MW of new customer sites recruited since program commencement have been greenfield DR sites, and therefore will not have issues with forgoing FCAS revenue to participate in this ARENA trial program.

Further to this, Enel X hopes that for any future permanent Strategic Reserve mechanism, participants will be given the opportunity to make firm commitments at least six months in advance of the time they are required to be available. Running tenders only 2-3 months prior to program start will see participants mobilise fewer MW, at a higher per-unit cost than if six months' lead-time were provided. Enel X detailed its thoughts on the 'timeline problem' in a submission to the AEMC's Reliability Frameworks Review – Interim Report⁴.

² As codified in the NER.

³ i.e. curtailing load in response to a high spot price.

⁴ Refer <https://www.aemc.gov.au/sites/default/files/2018-02/EnerNOC.pdf>

Participant lessons learnt from the recruitment of different customer types

As stated in previous reports, Enel X has recruited customers from various industries, including some which Enel X has not had substantial prior experience in other markets. The diversification into new industries such as the tertiary education sector has helped Enel X with achieving the 50 MW portfolio target for its ARENA contract.

Recently, Enel X has also found industries with high levels of regulatory and environmental compliance requirements, such as wastewater services, may also face difficulties in being able to provide DR at certain periods. As noted earlier in the report, one of Enel X's wastewater treatment sites advised of being unable to participate in the November DR test due to aeration issues on site, which were a regulatory compliance risk.

Finally, in the process of recruiting additional capacity to provide operational buffer for its VIC and NSW portfolios, Enel X also again found some program parameters restricted the pool of potential customers. These restrictive parameters included the maximum 4-hour curtailment duration, 10 min response time, along with the dynamic baseline and adjustment rules, made it unviable for some customers, particularly those with intermittent or unpredictable load profiles.

5. Details of other commercial or wholesale DR activity that the Recipient (pertaining to the DR funded under this Agreement) is participating in

Enel X is registered as a Market Ancillary Services Participant (MASP), a special category that enables independent aggregators to provide market ancillary services (including contingency FCAS).

The primary purpose of contingency FCAS participation is to restore grid stability following a contingent loss of generation. Contingency FCAS is used to correct major drops and rises in frequency (when the frequency is outside of the Normal Operating Frequency Band). Enel X has several customers in VIC and NSW who are registered to provide FCAS and are participating in the ARENA DR program.

Number of instances and duration the DR was activated for these other activities

Enel X's FCAS customers have responded to 39 low-frequency excursions since 1 December 2017 program start, including 18 events in the past six months which had an average duration of just over 4 minutes each.

Based on the various availabilities and operating profiles of Enel X's constituent customers, this does not necessarily mean all Enel X customers have responded 18 times.

Period the DR was activated for these other activities

These FCAS excursions occurred between 13 July 2018 and 18 December 2018. None of the events occurred during our November test events for the ARENA DR program, or had any significant impact on baseline demand levels for those events.

6. Participant lessons learnt from co-optimisation of ARENA-funded DR and other services provided by individual customers, including FCAS

As previously noted, Enel X has several customers dual-enrolled to provide both FCAS and ARENA DR. These customers already understand load flexibility from their FCAS participation so are well educated to consider and evaluate incremental DR opportunities.

For some of Enel X's FCAS customers, signing up for the ARENA DR trial seemed like a logical next step. Customers also appeared to appreciate that Enel X could not always make them available for both FCAS and ARENA dispatch at the same time. However, despite the potential impact on FCAS earnings during the forming of ARENA DR reserve contracts⁵, customers have all trusted Enel X to optimise their overall earnings across both programs.

The FCAS events are infrequent and only require load curtailment for a short time period of 10 minutes or less. Enel X is able to opt customers out of the FCAS market when needed, to ensure that loads are fully available for the ARENA program.

The trigger for bidding dual-enrolled customers out of the FCAS market is an AEMO invitation to tender (ITT) for reserve notice. Enel X will bid dual-enrolled customers out of FCAS markets during specified ITT and/or activation periods, in accordance with guidance Enel X received from AEMO. From a risk management point of view, Enel X will bid customers out as early as possible to ensure any potential FCAS trip does not affect customer baselines for measurement and verification of performance during an ARENA DR event.

Following receipt of an ITT from AEMO, Enel X rebids to remove all dual-enrolled customers from the FCAS market for the time period specified in the ITT, plus an additional four hours prior to the commencement of the ITT window (if possible) to minimise the possibility of an untimely frequency excursion causing adverse impact to the ARENA baseline.

7. Participant lessons learnt from “value stacking” ARENA funded DR with other services provided by individual customers, including opportunity costs

FCAS events are short in duration, so generally limited impact to customer operations. The ARENA program provides more certain availability payments and an energy payment (which Enel X's FCAS program does not). However, the ARENA program causes a much more significant disruption to site operations due to the length of time involved.

As stipulated in the RERT Panel Agreement for the ARENA DR Trial and detailed previously, the reserve provided by Enel X's customers cannot be offered to the market through any other means during the period of a reserve contract. This means if Enel X accepts an AEMO ITT for provision of short notice reserve during a specified period, then those dual-enrolled customers cannot be offered into the FCAS markets or other programs for that period.

Accordingly, customers incur an opportunity cost of not receiving FCAS revenue when Enel X accepts and forms a short notice reserve contract with AEMO, however in general Enel X expects the opportunity costs will be small compared to the annual value of ARENA Availability payments. Therefore, while there are opportunity costs for being removed from FCAS, customers

⁵ i.e. following the issuance and acceptance of an AEMO ITT

are positively aware they will also earn Availability Payments and Energy Payments based on their dispatch performance, as per their contracts with Enel X for the ARENA program.

Enel X's customers also understand the ARENA DR Trial is a three-year program funded by the Commonwealth and state governments, as part of initiatives to improve overall system reliability. Therefore as noted, in addition to financial incentives on offer, Enel X's customers seem to place some value on being part of an industry-wide solution for easing demand on grid infrastructure and helping to ensure system reliability during peak demand periods.

Appendix A – Customer types and geographic location

Key:

CC	City Centre
IS	Inner Suburbs
OS	Outer Suburbs
RC	Regional City
RA	Rural Area

VIC Portfolio (30 MW)

Customer	Type	Geographic location
VIC1	Agricultural Product Wholesaling	IS, north
VIC2	Building Structure Services	OS, east
VIC3	Building Structure Services	IS, west
VIC4	Fruit and Tree Nut Growing	RA, north
VIC5	Fruit and Tree Nut Growing	RC, north
VIC6	Fruit and Tree Nut Growing	RC, north
VIC7	Fruit and Tree Nut Growing	RA, north
VIC8	Other Warehousing and Storage Services	OS, west
VIC9	Other Warehousing and Storage Services	OS, west
VIC10	Other Warehousing and Storage Services	OS, north west
VIC11	Other Warehousing and Storage Services	RA, west
VIC12	Other Warehousing and Storage Services	OS, west
VIC13	Other Warehousing and Storage Services	OS, south east
VIC14	Other Warehousing and Storage Services	IS, west
VIC15	Other Warehousing and Storage Services	RA, north
VIC16	Other Warehousing and Storage Services	OS, north
VIC17	Other Warehousing and Storage Services	OS, north
VIC18	Grain Mill Product Manufacturing	OS, south east
VIC19	Tertiary Education	IS, north
VIC20	Tertiary Education	IS, east
VIC21	Tertiary Education	IS, north
VIC22	Tertiary Education	IS, north east
VIC23	Tertiary Education	IS, north east
VIC24	Tertiary Education	IS, south east
VIC25	Basic Chemical Manufacturing	OS, south west
VIC26	Basic Ferrous Metal Manufacturing	OS, west
VIC27	Fruit and Vegetable Processing	RC, north
VIC28	Grain Mill Product Manufacturing	RC, north west
VIC29	Grain Mill Product Manufacturing	IS, north

VIC30	Grain Mill Product Manufacturing	IS, north
VIC31	Other Wood Product Manufacturing	RC, north east
VIC32	Waste Treatment, Disposal and Remediation Services	OS, west
VIC33	Waste Treatment, Disposal and Remediation Services	OS, south west
VIC34	Water Supply, Sewerage and Drainage Services	RC, north
VIC35	Other Goods Wholesaling	OS, south east
VIC36	Other Goods Wholesaling	OS, south east
VIC37	Other Goods Wholesaling	OS, south east
VIC38	<i>New customer: Basic Non-Ferrous Metal Manufacturing</i>	<i>OS, north</i>
VIC39	<i>New customer: Retail</i>	<i>IS, west</i>
VIC40	<i>New customer: Retail</i>	<i>OS, south east</i>
VIC41	<i>New customer: Retail</i>	<i>OS, east</i>
VIC42	<i>New customer: Retail</i>	<i>OS, north</i>
VIC43	<i>New customer: Retail</i>	<i>OS, south east</i>
VIC44	<i>New customer: Retail</i>	<i>RC, south west</i>
VIC45	<i>New customer: Retail</i>	<i>OS, north</i>
VIC46	<i>New customer: Retail</i>	<i>OS, south east</i>
VIC47	<i>New customer: Retail</i>	<i>CC</i>
VIC48	<i>New customer: Retail</i>	<i>CC</i>
VIC49	<i>New customer: Retail</i>	<i>IS, north</i>
VIC50	<i>New customer: Retail</i>	<i>OS, north</i>

NSW Portfolio (20 MW)

Customer	Type	Geographic location
NSW1	Grain Mill Product Manufacturing	OS, south west
NSW2	Other Warehousing and Storage Services	OS, west
NSW3	Other Warehousing and Storage Services	OS, west
NSW4	Basic Chemical Manufacturing	OS, south west
NSW5	Building Structure Services	IS, west
NSW6	Basic Non-Ferrous Metal Manufacturing	OS, west
NSW7	Grain Mill and Cereal Product Manufacturing	IS, west
NSW8	Waste Treatment, Disposal and Remediation Services	IS, south
NSW9	Basic Ferrous Metal Manufacturing	OS, west
NSW10	Waste Treatment, Disposal and Remediation Services	OS, west
NSW11	Waste Treatment, Disposal and Remediation Services	IS, north

NSW12	Waste Treatment, Disposal and Remediation Services	RC, south
NSW13	Meat and Meat Product Manufacturing	OS, west
NSW14	Meat and Meat Product Manufacturing	OS, west
NSW15	Meat and Meat Product Manufacturing	OS, west
NSW16	Meat and Meat Product Manufacturing	OS, west
NSW17	<i>New customer: Paper Product Manufacturing</i>	<i>OS, south west</i>