AusNet

Demand Management Innovation Allowance Mechanism Annual Report - Public

FY2024

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Table of contents

1. Introduction

This annual report has been prepared pursuant to the Demand Management Innovation Allowance Mechanism (DMIAM) applied to AusNet by the AER in the 2021-26 Victorian Electricity Distribution Price Determination (the 2021-26 Price Determination). The DMIAM provides revenue designed to encourage innovation in demand side participation and non-network solutions.

The DMIAM requires AusNet to submit a report on expenditure attributed to DMIAM for each regulatory year, where the expenditure must fulfil the DMIAM criteria. The expenditure for the period from 1 July 2023 to 30 June 2024, for which we are claiming under the DMIAM, is $34,042. This residual amount relates to **EV Charge Management** where the aim is to design an end-to-end intelligent EV charge management system to allow high adoption of EVs while maintaining the increased demand within the constraints of the network. The trial will establish a comms path between smart chargers and the DNSP via an EV management platform. The trial commenced in 2021 and concluded in FY23. We have previously made claims under DMIAM in FY22 and FY23 which were approved by the AER.

DMIAM related expenditure for the twelve-month reporting period (in nominal dollars) is summarised in the following table.

The majority of the other projects in the DMIAM pipeline received business case approval in 2024. As a result, it is expected that further DMIAM expenditures will be claimed in FY2025 and FY2026.

Table 1 DMIAM expenditure in FY24 reporting period

Name of project	Operating expenditure	Capital expenditure	Total expenditure
EV Charge Management	$34,042	nil	$34,042
Total	**$34,042**	**nil**	**$34,042**

2. EV Charge Management

2.1. Project Overview

AusNet partnered with Jemena (project lead), United Energy, Evoenergy, TasNetworks, and Jet Charge (EV charging equipment supplier/installer) for this trial.

The project consortium collaborated to design an end-to-end intelligent EV charge management system to allow high adoption of EVs while maintaining the increased demand within the constraints of the network. The trial established a comms path between smart chargers and the DNSP via an EV management platform. The DNSP will send forecast and near real time data indicating network state to the smart chargers to disperse the charging demand to times where spare capacity is available.

The DNSPs worked together with inputs from the DER API working groups to establish a standardised interface to charging platforms that could then be published and replicated for use by other platforms in the future.

The 12-month trial concluded in 2023 and aimed to test the effectiveness of dynamic EV charge management of 175 EV customers across a wide variety of geographic regions. Participating in this project enables AusNet to participate and share knowledge with a retailer led ARENA trial with over 500 EV customers to gain insights into customer behaviour and preferences.

This trial is partially but not fully funded by ARENA. The costs outlined in this report are distinct from ARENA-funded costs.

2.2. Nature and Scope

This project aims to demonstrate that managed EV charging is possible, which will benefit networks and its customers by:

- Monitoring available network capacity in real time and proving technologies that can automatically control charging including time delay as well as throttling. This means that by monitoring network loading in real time, and by having a capability to predict non-EV loads in the short term, EV charging can be accommodated by:
    - Initiating EV charging
    - Delaying EV charging
    - Varying EV charging rates (throttling)
    - Understanding customer behaviour during the recruitment process and through customer surveys during and after demand response events.
    - Building capabilities to forecast the real household EV charging load associated with managed charging. This will avoid unnecessary network augmentation in the future, reducing costs for all customers in the form of reduced network charges compared to a scenario without managed charging.
    - Once this is established through this trial, DNSPs will have the certainty to align network infrastructure costs over both EV and non-EV electricity consumers.

2.3. Aims and Expectations

The key objectives of this study are to prove the concept of managing EV charging load dynamically with a real-time assessment of available network capacity to accommodate more EVs without the need for network augmentation.

The project aimed to deliver the following:

- estimate the impact of EV charging on future network infrastructure investment i.e., calculating the value of the network support;
- obtain customer insights and preferences on multiple charge management initiatives and incentives;
- obtain charging data for 175 privately owned EVs with and without intervention;
- demonstration of control boxes being used successfully to manage EV charging of Tesla cars, and smart chargers to manage other makes of EV; and
- demonstration of an aggregator as an intermediary between DNSPs and the charge points to orchestrate EV charging.

2.4. Process of Project Selection

AusNet undertook a pilot EV trial with 2019 Free Electrons winner, ev.energy. The small number of customers in the pilot trial gave a preliminary insight into the potential benefits and methods of control that can be used to help manage charging and limit network constraints.

Having undertaken this pilot trial, AusNet identified the need to understand the impact of electric vehicles more broadly and on a larger group of customers to better inform future augmentation and asset upgrades/replacements.

The project was justified by assessing the potential areas of the network and assets most at risk of high EV adoption and would likely require near term augmentation or replacement. The benefits of undertaking this trial far outweighed the BAU scenario.

2.5. Project Implementation

Detailed project plans were developed and submitted to ARENA for funding by Jemena on behalf of AusNet and the other DNSPs. ARENA approved $1.6M funding for this trial in January 2021.

Once the trial was approved by ARENA, customer recruitment commenced. Several methods were employed such as the creation of the brand name "EV GRID" along with a new dedicated website and supporting marketing documentation. The website explained the intended purpose of the trial and promoted the key Customer Value Proposition (CVP) – a free smart charger. The website also detailed the project partners, FAQs, and a Call to Action (CTA) - to register your interest.

To drive traffic to the website and promote the trial, a brochure was created that was distributed through various channels (including industry contacts, local councils, and EV groups). The project team actively targeted social media channels like the Tesla Owners Club of Australia (TOCA), Nissan LEAF Owners Australia, Hyundai EV Enthusiasts Australia, Electric Vehicles Australia to name a few. Furthermore, state-based media releases were also done in ACT, VIC and TAS after the Minister and ARENA had announced the trial.

The EVGRID website went live on February 26th, 2021 and had 3,000 unique visitors to the site over a 3-month period. From this, 595 people registered to participate in the trial. AusNet had 100 registered participants who were ultimately filtered down to the target recruitment number of 35.

AusNet successfully recruited 33 trial participants who all had hardware smart chargers installed at their premises. A hardware transformer monitor has also been installed on the distribution substation of 11 of these participants to monitor the substation in real-time and feed data back into AusNet's cloud platform and charge management algorithm developed for this project. Over the course of the project a total of 10 demand response events were conducted (5 demand response and 5 solar soak events).

Milestone 1

The first milestone was delivered on 31 May 2021. The key deliverables were related to the selection of hardware and software development of the relevant DNSP smart charging platform and customer acquisition.

Milestone 2

The second milestone was delivered on 31 May 2022. The key deliverables were customer acquisition and installation of hardware to support the trial, including the installation of hardware transformer sensors on the distribution substations of some of the trial participants, and the installation of the smart chargers at each trial participants premises.

Milestone 3

The third milestone was delivered on 30 November 2022. The key deliverables were the completion of several demand response events and subsequent customer surveys to gain insight into the customer experience of the managed charging events. A total of eight (8) demand response events were conducted as part of Milestone 3.

Milestone 4

The fourth and final project milestone was delivered on 18 April 2023. The key deliverables were the completion of the project and final report outlining the trial findings and recommendations.

2.6. Implementation Costs

Cost on this trial were incurred by AusNet in FY22, FY23, and FY24.

- The costs of $80,118 that were incurred in the twelve-month period from July 2021 to June 2022 were mainly spent on software delivery including algorithm development, vendor procurement, and requirements and installation of the transformer monitors. These costs are distinct from ARENA funding.

- The costs of $214,687 that were incurred in the twelve-month period from July 2022 to June 2023 were mainly spent on running demand response events throughout the trial period and subsequent analysis of the data collected over the course of the trial to understand the costs and benefits of managed charging.
- The costs of $34,042 that were incurred in the twelve-month period from July 2023 to June 2024 are the residual cost of the program.

2.7. Benefits

Managed charging will allow AusNet to:

- Minimise network augmentation by deferring charging during high demand periods when the network is constrained.
- Mitigate voltage and system security issues (reverse power flow) arising from the variability of existing rooftop solar PV generation by initiating charging during low demand periods.
- Increase network efficiency by increasing asset utilization and network energy throughput (the amount of energy transported through the network of existing poles and wires), which leads to a reduction in the cost of network charges to all customers.
- Increase the overall hosting capacity of DER.
- Identify new value streams and value stacking mechanisms to meet network, customer and market requirements.

The trial provided AusNet, and industry, with valuable insights in to managed EV charging, including willingness and effectiveness of managing trial participants EV chargers. These insights could be used to develop future programs which explore an option to scale up management of EV chargers, which can benefit the network and be implemented to meet customers preferences.

2.8. External Communications Undertaken

The project was announced by the Energy Minister in February 2021. Since then, the EV Grid website went live to allow customers express interest in the trial. To promote the trial and drive traffic to the website, we created a flyer that we used through various channels (including industry contacts, local councils, and EV groups). The CTA for the flyer was to visit the EV Grid website. We actively targeted EV owners' groups on social media channels, like the Tesla Owners Club of Australia (TOCA), Nissan LEAF Owners Australia, Hyundai EV Enthusiasts Australia (Ioniq & Kona), Electric Vehicles for Australia, and members of the Australian Electric Vehicle Association (AEVA).

AusNet received 100 expressions of interest. We were successfully able to sign up our target of 33 EV customers for the trial. The 100 EOIs were received by end of March and initial screening was done during April. During this initial screening stage, further customer comms was undertaken to receive more information from the customers. After initial screening, further filtering was done based on the information received from the customers and the final 33 were selected by end of June 2021.

2.9. Next Steps

This trial has now concluded with the final ARENA report[1], and reports from the earlier stages, available to the public on the ARENA website[2]. Quantitative results, analysis and insights are outlined in the reports, including behavioural and technical insights. These results will be considered when exploring options to minimise the impact and need for network upgrades driven by EV charging as more customers on our network adopt EVs. AusNet will be using the learnings from the trial to inform the company EV strategy and future EV related trials.

[1] Jemena Dynamic Electric Vehicle Charging Trial Project Final Knowledge Sharing Report April 2023
[2] https://arena.gov.au/projects/jemena-dynamic-electric-vehicle-charging-trial/

3. Certification of Costs

Appendix-1 of this report contains a statement signed by a director of AusNet confirming that the costs of the above demand management projects:

a) are not recoverable under any other jurisdictional incentive scheme,

b) are not recoverable under any other state or Commonwealth government scheme, and

c) are not included in the forecast capex or opex approved in the AER's distribution determination for the regulatory control period under which the DMIAM applies, or under any other incentive scheme in that determination.

4. Developments in future DMIA/M projects

Over the next few years, we have several key projects aimed at improving network resilience, enhancing solar hosting capacity, and supporting renewable energy integration. Below is a summary of the projects planned for the next few years. These projects reflect our commitment to enhancing network reliability, integrating renewable energy, and preparing for the future needs of our customers and communities.

4.1. Battery Tariff Trial

Objective: This trial aims to develop four new tariff structures within our IT systems, two for Neighbourhood Batteries and two for Battery Energy Storage Systems (BESS), to reward local solar usage. The project will gather insights into peak loads and excess solar generation to facilitate battery charging and discharging under these new tariff structures.

Scope: The trial will allow a selection of customers to be billed under the new tariffs, enabling interaction with the market and allowing retailers to request and transfer customers onto these tariffs. The system will also aggregate market data and bill customers according to time-based pricing.

4.2. Telecommunication Support Battery

Objective: This project aims to enhance the resilience of critical telecommunication sites in remote communities. Two high-priority telecommunication sites have been targeted for supply upgrades, addressing vulnerabilities exposed during previous severe weather events.

Scope: The installation of batteries at these sites will ensure continuous communication services during network outages, providing essential support to these remote areas during emergencies.

4.3. LV Battery Program

Objective: This project involves the installation of ten 40kVA/85kWh low-voltage (LV) battery energy storage systems in areas with high solar penetration. These batteries will improve solar hosting capacity and enable greater solar export by stabilizing the local grid.

Scope: AusNet will own and operate the batteries, which will be leased to third parties for participation in contestable markets. This is the first time AusNet-owned, distribution-connected batteries will be deployed, creating a model for future battery integration.

4.4. Critical Water Utility Batteries

Objective: To install batteries at critical water and wastewater sites to manage demand during extreme weather events, while also improving solar hosting capacity in the surrounding network. The batteries will provide network support during peak demand and act as backup power sources during outages, reducing water supply disruptions caused by power failures.

Scope: The proposed BESS will enhance supply reliability, ensure continuous water services during outages, and support solar generation in adjacent network areas.

4.5. EV Pole Top Charger

Objective: This project aims to make electric vehicle (EV) charging more accessible and affordable for local communities by installing pole-top EV chargers.

Scope: By utilizing existing infrastructure, the project will enable convenient EV charging in areas where traditional charging stations are not feasible, promoting wider EV adoption and reducing the barriers to entry for electric vehicles.

5. DMIAM Criteria

The expenditure recoverable under the DMIAM must satisfy the following DMIAM criteria:

1. Demand management projects or programs are measures undertaken by a DNSP to meet customer demand by shifting or reducing demand for standard control services through non-network alternatives, or the management of demand in some other way, rather than increasing supply through network augmentation.
2. Demand management projects or programs may be:
    a. broad-based demand management projects or programs—which aim to reduce demand for standard control services across a DNSP's network, rather than at a specific point on the network. These may be projects targeted at particular network users, such as residential or commercial customers, and may include energy efficiency programs and/or
    b. peak demand management projects or programs—which aim to address specific network constraints by reducing demand on the network at the location and time of the constraint.
3. Demand management projects or programs may be innovative, designed to build demand management capability and capacity and explore potentially efficient demand management mechanisms, including but not limited to new or original concepts.
4. Recoverable projects and programs may be tariff or non-tariff based.
5. Costs recovered under the DMIAM:
    a. must not be recoverable under any other jurisdictional incentive scheme
    b. must not be recoverable under any other Commonwealth or State/Territory Government scheme and
    c. must not be included in forecast capital or operating expenditure approved in the distribution determination for the regulatory control period under which the DMIAM applies, or under any other incentive scheme in that determination.
6. Expenditure under the DMIAM can be in the nature of capital or operating expenditure.

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