

Decision

Demand Management

Innovation Allowance

Mechanism expenditures

2019–20, 2020–21 & 2021–22

July 2023

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AER reference: AER22006075

Amendment record

Version	Date	Pages
1	July 2023	14

Contents

1	Summary	1
1.1	Key outcomes.....	2
2	Background	4
2.1	Operation of the scheme.....	4
2.2	Incentive allowance.....	5
2.3	Assessment against criteria.....	5
3	How distributors use the DMIAM	7
3.1	Successes of demand management innovation allowance.....	8
4	Assessment for 2019–20, 2020–21 and 2021–22	10
	DMIAM project category definitions	13
	Glossary	14

1 Summary

Our demand management innovation allowance mechanism (DMIAM) provides distribution businesses with funding for research and development in demand management projects that have the potential to reduce long term network costs.

The DMIAM applies to distribution business' eligible projects as set out in our distribution determination for each distribution business. To receive the innovation allowance, the distribution business must report on their projects to us including the amount of the allowance spent, a list and description of each eligible project on which the allowance was spent and a summary of how and why each eligible project complies with the project criteria.

For each eligible project completed in a regulatory year, distribution businesses must describe how the project will inform future demand management projects, including any lessons learnt. Lessons learnt may include demand management projects or techniques (either generally or in specific circumstances) that are unlikely to form technically or economically viable non-network options as well as successful projects and techniques. Distributors must also provide any other information required to enable an informed reader to understand, evaluate, and potentially reproduce the demand management approach of an eligible project.

A key objective of our DMIAM is to assist in enhancing industry knowledge of practical demand management projects through the annual publication of DMIAM activity reports from distributors.

Our DMIAM complements our demand management incentive scheme (DMIS) by increasing the capacity of distribution businesses to invest in ideas that may eventually form parts of projects under the DMIS.¹

Prior to this, the DMIS was supported by the Demand Management Innovation Allowance (DMIA). The DMIA was provided as a fixed amount of revenue at the commencement of each regulatory year in the regulatory control period to distribution businesses to whom it applied.

While the DMIAM is like the DMIA, the key differences are, the DMIAM:

- increased the size of the fund to encourage about 30 percent more research and development (on average),
- tightened the criteria for project eligibility, and
- clarified reporting requirements to emphasise the sharing of project learnings across industry.

The DMIAM first applied to NSW, ACT, TAS and NT distributors in financial year 2019–20, for SA and QLD distributors 2020–21, then to VIC distributors in 2021–22.

¹ The objective of the DMIS is to provide electricity distribution businesses with an incentive to undertake efficient expenditure on non-network options relating to demand management. The DMIS gives DNSPs a financial incentive of up to 50% of their expected costs of efficient demand management projects. The total incentive in any year cannot exceed 1% of the distributor's allowed revenue for that year.

This document presents an overview of the demand management innovation projects undertaken by distributors and our reasons for approving the expenditures claimed. Full details of the demand management projects are published on the AER’s website in conjunction with this decision paper.

Section 2 of this report explains the background of the DMIAM including the operation of the scheme, the innovation allowance, and our assessment criteria.

Section 3 outlines how distribution businesses are using the DMIAM.

Section 4 of this report sets out our assessment, against the criteria in the DMIAM, on incentive payments to distribution businesses for eligible demand management projects in 2019–20, 2020–21 and 2021–22.

The details of each demand management project, eligible for a DMIAM innovation allowance, can be found on our website, www.aer.gov.au.²

1.1 Key outcomes

We approved the following DMIAM expenditures for 2019–20, 2020–21 and 2021–22.

Table 1 Approved DMIAM expenditures for FY2019, 2020 and 2021 (\$000, nominal)

	2019–20	2020–21	2021–22	Total
2019–24 revenue determinations				
Ausgrid	1,348	1,236	767	3,351
Endeavour Energy	260	534	651	1,445
Essential Energy	13	-	251	264
Evoenergy	276	252	405	933
TasNetworks	-	180	479	659
Power & Water	-	-	343	343
2020–25 revenue determinations				
Energex	-	894	248	1,143
Ergon Energy	-	1,575	379	1,953
SAPN	-	373	462	835
2021–26 revenue determinations				
CitiPower	-	-	83	83
AusNet	-	-	80	80
Jemena	-	-	240	240
Powercor	-	-	102	102
United Energy	-	-	75	75
Total	1,898	5,044	4,564	11,506

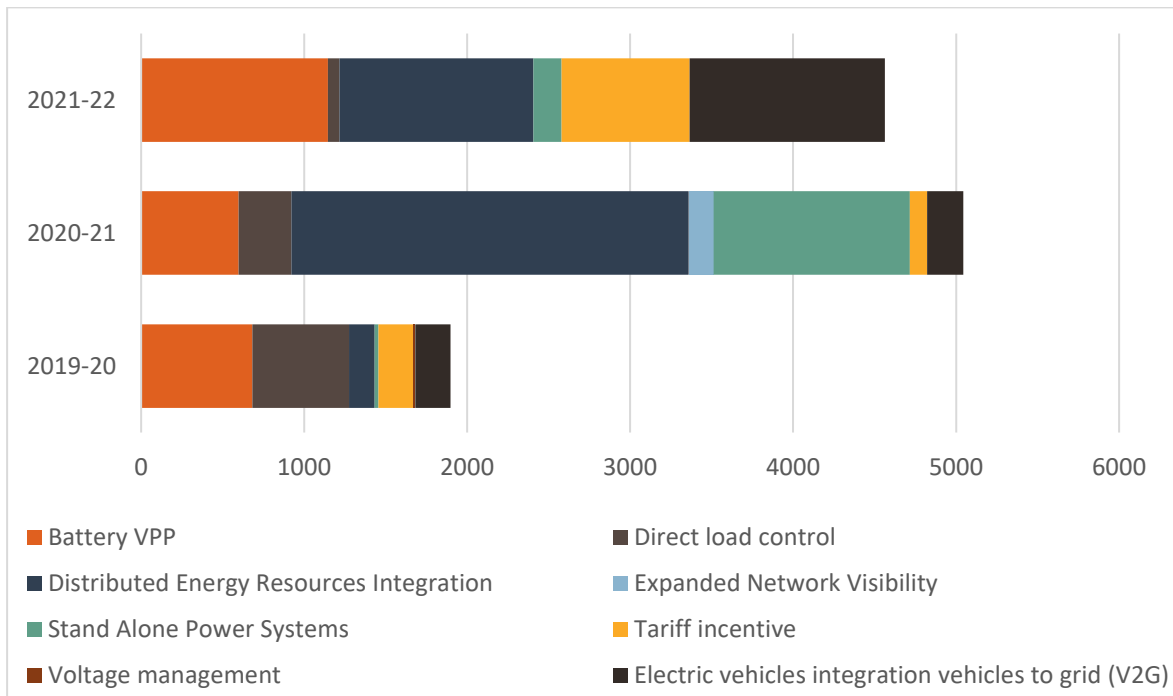
Note: Numbers may not add up to total due to rounding.

Source: AER analysis and DMIAM reports submitted by DNSPs.

² <https://www.aer.gov.au/networks-pipelines/compliance-reporting/demand-management-innovation-allowance-mechanism-assessment-2019%E2%80%9320-2020%E2%80%9321-and-2021%E2%80%9322>

Approved expenditures are shown by project category in Figure 1 below.

Figure 1 DMIAM expenditures by project category (\$' 000 nominal)



Note: See glossary for definitions of these project categories.

2 Background

Historically, network businesses have often focused on supply-side solutions to meet the demand on their networks, without always giving due attention to the demand side of the equation. There are several potential reasons for this behaviour, including the possibility that the regulatory system encourages distribution businesses to prefer network capex over non-network options.

Managing demand on electricity networks can increase the reliability of supply and reduce the cost of supplying electricity. Often, electricity consumers are empowered to manage demand via price signals and enabling technology. Price signals or financial incentives can reward consumers for using electricity in a way that allows network businesses to keep their costs down. Enabling technology often complements price signals by empowering consumers use electricity in a way that allows network businesses to keep their costs down.

On 14 December 2017, we published our DMIAM to encourage distribution businesses to undertake innovative projects aimed to deliver ongoing reductions in demand or peak demand. The DMIAM achieves this by providing financial incentives to distribution businesses to undertake research and development in demand management projects that have the potential to reduce long-term network costs.³

2.1 Operation of the scheme

We determine how, if at all, the DMIAM will apply to a distributor for a regulatory control period.⁴

If the DMIAM is to apply, the distributor must identify eligible projects. An eligible project must be a project or program for researching, developing, or implementing demand management capability or capacity; be innovative; and have the potential (if proved viable) to reduce long term network costs. An innovative project is defined as:

- based on new or original concepts; or
- involving technology or techniques that differ from those previously implemented or used in the relevant market; or
- focused on customers in a market segment that significantly differs from those previously targeted by implementations of the relevant technology, in relevant geographic or demographic characteristics that are likely to affect demand.

For each regulatory year, a distributor must submit a compliance report to us in accordance with section 2.3 of the DMIAM.⁵ We use the information provided in the distributors' annual DMIAM report to assess distributors' compliance with the DMIAM criteria and entitlement to recover expenditure under the DMIAM. The distributors' reports also provide information to

³ The Australian Energy Market Commission made rule 6.6.3A of the NER following rule change proposals put forward by the Total Environment Centre and the Council of Australian Governments Energy Council.

⁴ The AER's framework and approach paper for a distributor will set out whether the AER intends to apply the DMIAM to that distributor's forthcoming determination under clause 6.8.1(b)(2)(vi) of the NER.

⁵ AER, *Demand management innovation allowance mechanism*, December 2017.

stakeholders more broadly on the nature of the DMIAM projects that may ultimately progress to operating activities or more mature investments.

We then determine the amount of the allowance recoverable by the distributor in accordance with the DMIAM for each regulatory year of a regulatory control period in accordance with sections 2.4 and 2.5 of the DMIAM.

2.2 Incentive allowance

The allowance is made up of a fixed amount of \$200,000⁶ plus an additional 0.075 percent of the distributor's annual revenue requirement (ARR). The allowance is calculated annually based on the relevant distributor's ARR, as defined in the DMIAM.

Distributors recover this amount from customers throughout the regulatory control period. If the allowance is not spent in full at the end of the regulatory control period, we calculate a carryover adjustment amount to be returned to consumers. The distributor bears any overspent amount above its allowance.

2.3 Assessment against criteria

Each year we assess claims for the innovation allowance against the DMIAM project criteria. There are three DMIAM project criteria:

Criterion 1: An eligible project must be a project or program for researching, developing, or implementing demand management capability or capacity.

This requirement encourages distributors to direct their research and development funding towards projects that will help achieve the 'Allowance Objective.'⁷

Criterion 2: To be eligible, a project must be innovative and have the potential to reduce long-term network costs. In this context, innovation means, that a project:⁸

- is based on new or original concepts. For clarity, we consider this could include new or original ways of building or developing capability and capacity to undertake, facilitate or utilise demand management; or
- involves technology or a technique not previously implemented in the relevant market; or
- is focussed on customers in a market segment that has not been exposed to the technology.

A new or original concept can include new or original ways of building or developing capability and capacity to undertake, facilitate or utilise demand management. Moreover, we

⁶ For the 2017 regulatory year-end, escalated annually by the consumer price index (CPI).

⁷ NER cl. 6.6.3A(b). The objective of the demand management innovation allowance mechanism is to provide Distribution Network Service Providers with funding for research and development in demand management projects that have the potential to reduce long term network costs (the demand management innovation allowance objective).

⁸ Australian Energy Regulator, *Demand Management Innovation Allowance Mechanism*, December 2017, cl. 2.2.1(1)(b).

understand that an innovative research and development project can have multiple stages consistent with iterative technology innovations.

It is expected that distribution businesses will focus on applying well-demonstrated safe and reliable technologies that can readily be employed to the electricity network, rather than researching or trying unproven technologies such as new types of control gear, battery or inverters that are still in the developmental stage.

The key approach for assessing demand management innovations will be to check whether the project scopes will help a distributor to increase its knowledge on a particular demand management technique, rather than repeating previous trials. Hence, trying a new way of applying a demand management technique not previously tried is acceptable.

Criterion 3: A distributor's costs of a project or program are not eligible for recovery under the mechanism if those costs are:

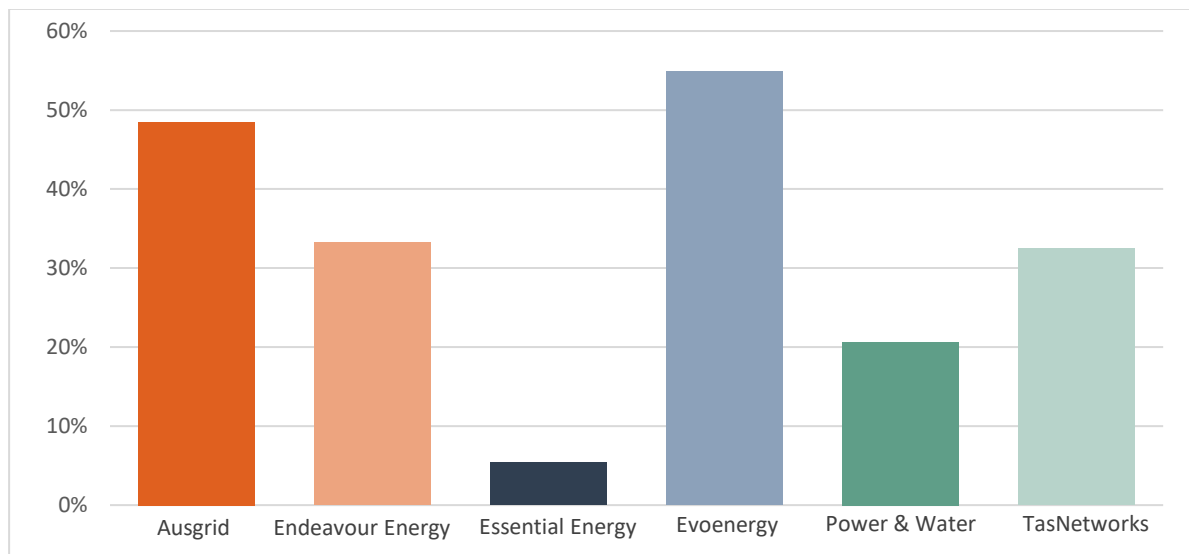
- recoverable under any other jurisdictional incentive scheme.
- recoverable under any state or Australian Government scheme; or
- otherwise included in forecast capital expenditure or operating expenditure approved in the distributor's distribution determination.

Note: For the avoidance of doubt, the mechanism does not require a distributor's eligible project to be geographically constrained to its distribution network.

3 How distributors use the DMIAM

Distributors have different approaches for utilising DMIAM funding. Figure 2 shows DMIAM expenditure (2019–22) as a share of total allowance for NSW, ACT, TAS and NT distributors. Figure 2 does not show DMIAM expenditure for other distributors in the National Electricity Market as the DMIAM first applied to these distributors in 2020–21 or 2021–22. Therefore, insufficient conclusions can be drawn from the data at this stage. Overall, by the third year (2021–22) of the 5-year regulatory period, the six distributors have spent an average of 33 per cent of their DMIAM allowances.

Figure 2 DMIAM expenditure (2019–22) as a share of regulatory period allowance (2019–24)



Source: AER analysis and DMIAM reports submitted by DNSPs.

Table 2 DMIAM expenditure for the 2019–2024 regulatory control period (\$000, real 2021–22)

Distributor	2019–20	2020–21	2021–22	Total expenditure (3 years)	Allowance (5 years)	Expenditure / Allowance
Ausgrid	1,396	1,263	767	3,426	7,064	48.5%
Endeavour Energy	270	545	651	1,466	4,411	33.2%
Essential Energy	14	-	251	265	4,883	5.4%
Evoenergy	286	258	405	948	1,729	54.8%
TasNetworks	-	184	479	663	2,040	32.5%
Power & Water	-	-	343	343	1,659	20.7%
Total	1,965	2,250	2,895	7,110	21,787	32.6%

Note: Numbers may not add up to total due to rounding.

Source: AER analysis and DMIAM reports submitted by DNSPs.

Table 3 DMIAM expenditure approved for FY2020, 2021 and 2022 (\$000, nominal)

Project type	2019–20 Expenditure	2020–21 Expenditure	2021–22 Expenditure
Battery VPP	682	597	1146
Direct Load Control	593	325	70
Distributed Energy Resources Integration	159	2437	1190
Expanded Network Visibility	0	153	0
Stand Alone Power Systems	23	1204	174
Tariff Incentive	213	106	786
Voltage Management	13	0	0
Electric Vehicles Integration Vehicles to Grid (V2G)	215	223	1198
Total	1,898	5,044	4,564

Note: Numbers may not add up to total due to rounding.

Source: AER analysis

3.1 Successes of demand management innovation allowance

In 2014, United Energy undertook a demand management project called the “Summer Saver (Demand Response) Trial.” This trial investigated various demand management options to determine how effectively and efficiently customer demand could be used as a non-network alternative to address peak demand. The aim of the project was to enable United Energy to develop a demand management model that could describe the best combination of mechanisms available to United Energy to create the biggest peak demand reduction at specific locations based on customer demographics and load profiles.

The success of the Summer Saver (Demand Response) Trial led it to being implemented by United Energy as a business-as-usual activity at a net benefit to consumers of \$483,000 in 2022–23. For more information about the Summer Saver project see our website.⁹

In 2017, with funding from the Australian renewable energy agency (ARENA), United Energy used the knowledge it gained from its trial to implement a demand response project. The project enabled reductions in voltage while maintaining voltage compliance during the demand response event and established that demand response can be used to maintain network stability. For further details, see ARENA.gov.au.¹⁰

⁹ <https://www.aer.gov.au/networks-pipelines/compliance-reporting/demand-management-incentive-scheme-dmis-assessment-2020%E2%80%9321-and-2021%E2%80%9322>

¹⁰ <https://arena.gov.au/projects/united-energy-distribution-demand-response/>

4 Assessment for 2019–20, 2020–21 and 2021–22

Below are examples of projects that we have assessed and approved over FY2020, 2021 and 2022. We have not included all 102 projects that were reviewed as interested readers are able to engage with them by reading respective distributors' DMIAM reports via our [website](#).¹¹

Ergon Energy's—DMIA Allawah Fringe of Grid Field Trial (Battery VPP)

This project is to field trial battery energy storage system (BESS) technologies that can reduce the overall demand on the Western Fringe of Grid and SWER by supplementing customer loads and enabling increased value from customer solar PV systems.

Criterion#1: MET

The storage of customers renewable energy in batteries with a hybrid inverter can be used on problematic fringe of grid locations to reduce the demand and improve power quality on the grid overall and at the customer connection to an acceptable level, to avoid network capital works.

Criterion#2: MET

The project is innovative using commercially available BESS technology programmed in a way to support both the customer and the grid.

Criterion#3: MET

Confirmed on page 4 of Ergon Energy's DMIAM 2021–22 report.

CitiPower's— Trial Tariff project (Tariff incentive)

The purpose of this project is to trial new network tariffs from 1 July 2022 which could shift demand away from peak demand times to minimum demand times.

Criterion#1: MET

The trial tariffs are designed to either reduce peak demand or increase minimum demand, they have the potential to reduce long term network costs.

Criterion#2: MET

This is the first time that CitiPower is implementing tariff trials.

Criterion#3: MET

Statutory declaration by CitiPower officer for 2021–22.

¹¹ <https://www.aer.gov.au/networks-pipelines/compliance-reporting/demand-management-innovation-allowance-mechanism-assessment-2019%E2%80%9320-2020%E2%80%9321-and-2021%E2%80%9322>

TasNetworks'—Derwent Bridge microgrid feasibility study (DER integration and Automation)

This project is focused on the development of a feasibility study into a Microgrid solution to address future power needs of all Derwent Bridge customers (residential and business) connected to the current 16.3 km long 110 kV line emanating from the Butlers Gorge switching station.

Criterion#1: MET

This project is to undertake a study at Derwent Bridge to investigate the feasibility of a microgrid comprised of demand management, mini pumped hydro, battery energy storage, hydrogen generation, thermal storage, or a combination.

Criterion#2: MET

The Derwent Bridge microgrid feasibility study project is considered an innovative project as it can reduce the long-term network costs inherent in supplying the Derwent Bridge community.

Criterion#3: MET

Confirmed on page 64 of TasNetworks DMIAM 2021–22 report.

SA Power Networks— Smart hot water trial (Direct load control)

This project aims to provide an immediate and cost-effective opportunity to increase network and system-wide hosting capacity for solar PV using a significant resource of 900MW of electric hot water installed in South Australia to reduce peak demand and utilising their significant energy storage potential.

Criterion#1: MET

The VPP Project seeks to prove that smart electric hot water storage systems can also provide aggregated demand response within a Virtual Power Plant (VPP) and deliver potential wholesale and Frequency Control Ancillary Services (FCAS) value to participating customers, supporting stabilisation efforts on the South Australian grid, and enabling load shifting to soak up energy from solar during the day.

Criterion#2: MET

The Project aims to trial innovative approaches to demand management capability by utilising significant energy storage potential of hot water and thereby reducing peak demand.

Criterion#3: MET

Confirmed on pages 9–10 of SAPN's DMIAM 2020–21 report.

Energex—Evolve (Distributed Energy Resources Integration)

The Project scope is to calculate the operating envelopes for DER assets using a variety of low voltage (LV) and medium voltage (MV) network data sources and will include the as-switched network model.

Criterion#1: MET

The project investigates ways to shift or reduce demand for standard control services through non-network alternatives. The evolve project includes active management of DER to enable visibility and control of targeted network areas with constraints. The operating envelopes will provide an upper and lower limit for safe operation of the network for both DER import and export that potentially can be used to implement more granular and effective demand management programs to respond to local network constraints.

Criterion#2: MET

The project is innovative as it includes the augmentation and extension of software systems and installation of additional sensors targeting specific locations to calculate and publish normal-state and emergency operating envelopes and constraints that apply to individual or aggregated DER operating within the electrical network. The current and forecast operating state. The operating envelopes will be published to DER aggregators and other interested parties.

Criterion#3: MET

Confirmed on page 4 of Energex's DMIAM 2020–21 report.

Ergon Energy—West Leichhardt SWER (Stand Alone Power Systems)

This project involves trialling two larger scale stand-alone power systems (SAPS) as network support devices as an alternative to grid supply.

Criteria #1 MET

The project objective is to meet demand by a remotely located customer in a way other than network augmentation. The project will enable the substitution of costly network components with alternative supply arrangements that provide improved power quality and reliability whilst enabling improved value to all customers.

Criteria #2 MET

The project seeks to examine a potentially cost-efficient mechanism in managing demand.

Criteria #3 MET

Confirmed on page 4 of Ergon Energy's DMIAM 2020–21 report.

DMIAM project category definitions

Term	Definition
Direct load control	Control of customers' appliances.
Behind meter battery (VPP)	Identify effective ways to make best use of behind the meter battery systems.
Small size battery	Identify effective ways to make best use of small size battery systems.
Tariff incentive	Incentivise customers to shift load away from peak period.
Grid scale battery	Identify effective ways to make best use of large battery systems.
Electric vehicles integration vehicles to grid (V2G)	Vehicle-to-grid (V2G) describes a system in which plug-in electric vehicles (EVs), such as battery electric vehicles (BEV) or plug-in hybrids (PHEV) to communicate with the power grid to sell demand response services by either returning electricity to the grid or by throttling their charging rate.
Distributed energy resources (DER) Integration	Identify how to best manage the grid assets to increase DER integration capacity.
Standalone power systems (SAPS)	Identify how to use SAPS to reduce the peak demand of the integrated grid.
Expanded network visibility	To develop the tools and systems to enable the scale-up of Distribution System State Estimation that will facilitate better orchestration of distributed energy resources.
Voltage management	To test inverters advanced solar inverters within virtual power plants arrangements to better manage the demand for network capacity and integration.

Glossary

Term	Definition
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
capex	capital expenditure
DMIA	demand management innovation allowance
DMIAM	demand management innovation allowance mechanism
DMIS	demand management incentive scheme
DNSP	distribution network service provider
DRED	demand response enabled device
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NNA	non-network alternatives
NSP	network service provider
opex	operating expenditure
PV	photovoltaic
