Decision

Applications by DNSPs for Demand Management Innovation Allowance for:

QLD, SA and TAS	2015-16 Financial year
VIC	2016 Calendar year
ACT and NSW	2014-15, 2015-16 Financial year

July 2017

AUSTRALIAN ENERGY REGULATOR

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
Melbourne Vic 3001

Tel: (03) 9290 1444
Fax: (03) 9290 1457

Email: AERInquiry@aer.gov.au

AER Reference: 53792

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Summary

The Demand Management Incentive Scheme (DMIS) aims to provide incentives for Distribution Network Service Providers (DNSPs) to conduct research and investigation into innovative techniques for managing demand. It also aims to enhance industry knowledge of practical demand management projects and programs through the publication of annual DMIS reports. The DMIS has been applied to all DNSPs in the NEM as part of our current distribution determinations.

The AER published its DMIS for the non-Victorian DNSPs (in October and November 2008) and Victorian DNSPs (in April 2009) in accordance with clause 6.6.3 of the National Electricity Rules (NER).

We are currently reviewing the DMIS and looking at the development of a new scheme and allowance mechanism. Further details on this review are available from AER's web site https://www.aer.gov.au. This decision relates to the operation of the existing scheme only.

The DMIS contains a Demand Management Innovation Allowance (DMIA) element. DMIA is provided to each DNSP in the form of a fixed allowance for each regulatory period. DNSPs are required to justify and seek our approval of their actual DMIA expenditures on demand management improvement projects.[1]

Under the current framework, if a DNSP has not spent its DMIA allowance in the regulatory period, it will be required to return the amount of any underspend or unapproved amounts to customers in the form of tariff reduction. However, any over-spend would be borne by the DNSP.

DNSPs are required to report their DMIA expenditures and activities to us each regulatory year. We approve or reject DNSPs' claims based on our assessment against the six criteria listed in section 2 of this paper. While descriptive, the criteria enable a wide range of demand management project options.

This report presents our assessment and findings of DNSPs' annual expenditure claims. DMIA reports from all 13 electricity distributors were provided to us as part of the DNSPs' 2014–15, 2015–16 and 2016 RIN responses, as appropriate.

How distributors used the DMIA

This section analyses investments provided under the current scheme. This information provides insight into the level of expenditure we have approved and the type of projects the current scheme has delivered.

Distributors had different appetites for utilising funding under the DMIA. Figure 1 below compares our total allowance with actual expenditure by distributors for current regulatory period. We have approved all the DMIA expenditure claimed by all of the

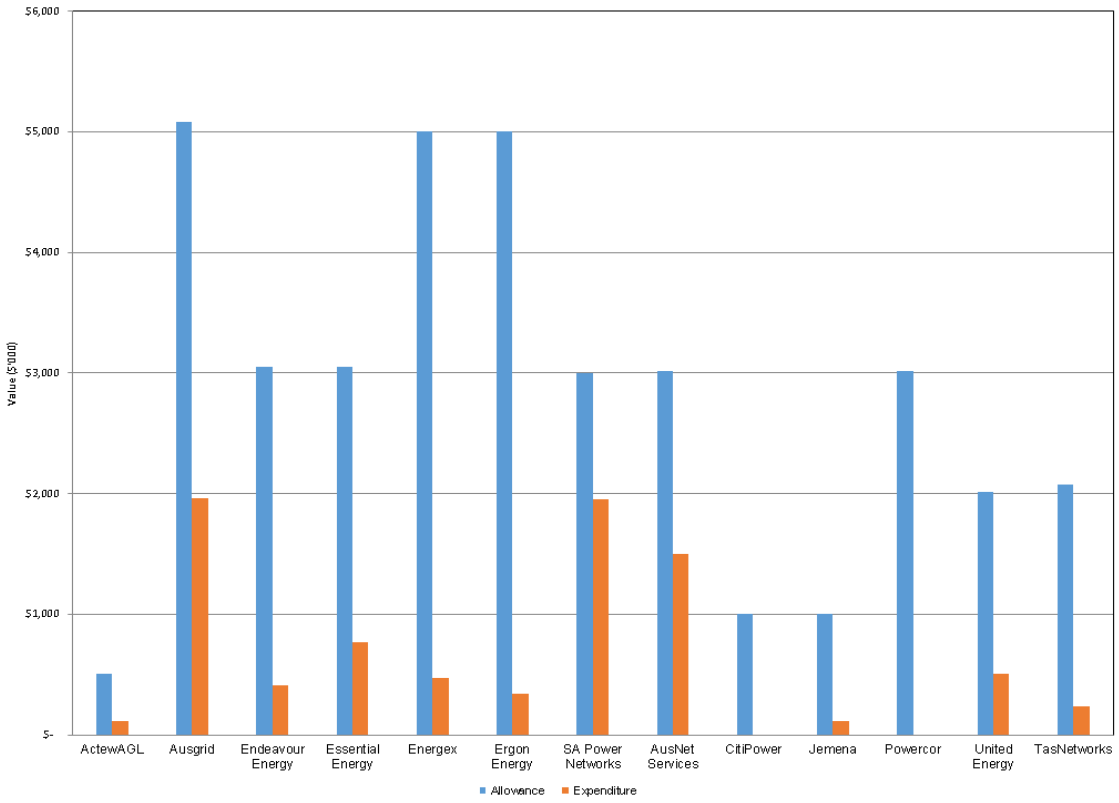
[1] The DMIS reports from each of the DNSPs are available on our website at www.aer.gov.au.

DNSPs, as the expenditure complies with the DMIA criteria. Summaries of each DNSP's DMIA expenditures are shown in the tables 1- 4 below covering each of their respective regulatory periods, by jurisdiction. Chapters 4-16 provide further details of each project for each DNSP that has been funded through the DMIA.

The expenditure of the distributors, compared to their DMIA allowances, varied widely. This is set out in the tables below and illustrated in figure 1. While the allowance is for the whole of the regulatory period, the expenditure column gives expenditure to date in the relevant period. Therefore the comparison is affected by where the DNSP is in the regulatory period, which differs between DNSPs. Of the 13 distributors reviewed, only Ausgrid, AusNet Services and SA Power Networks are on track to spend their allocation. TasNetworks spent only 25 per cent of its allocation by the time of its fourth year of its five year regulatory period that is covered by this report.[2]

Also, rather than spreading out the DMIA project works evenly across the regulatory period, some distributors completed the majority of their DMIA allowance within the two last years of the regulatory control period. Other distributors spent none of their allowance in some years, for example, CitiPower and Powercor spent none of their allowance in 2016, their first regulatory year that is covered by this report.

Figure 1 Comparison of expenditure with allowance



Source: AER analysis and DMIA reports submitted by DNSPs

[2] TasNetworks distribution is now in its first year of the new regulatory period, but the report relates to year 4 of its previous regulatory period.

Table 1 ACT/NSW DNSPs DMIA expenditure for the 2014–15 to 2018–19 regulatory control period ($'000 nominal)

DNSP	DMIA approved for 2014–15	DMIA approved for 2015–16	Total DMIA allowance for the period	Total DMIA approved to date	DMIA remaining for the period	Proportion of approved DMIA spent
ActewAGL	72.8	37.6	502.8	110.4	392.4	22%
Ausgrid	1 363.0	599.7	5 080.0	1 962.7	3 117.3	39%
Endeavour Energy	378.8	30.6	3 048.0	409.4	2 638.6	13%
Essential Energy	502.7	266.8	3 048.0	769.5	2 278.5	25%
TOTAL	2 317.3	934.7	11 678.8	3 252.0	8 426.8	28%

Source: AER analysis and DMIA reports submitted by DNSPs; numbers may not be exact due to rounding.

Table 2 QLD/SA DNSPs DMIA expenditures for the 2015–16 to 2019–20 regulatory control period ($' 000 nominal)

DNSP	DMIA approved for 2015–16	Total DMIA allowance	DMIA approved to date	DMIA remaining for the period	Proportion of approved DMIA spent
Energex	427.4	5 000	427.4	3 625.9	9%
Ergon Energy	337.7	5 000	337.7	1 823.2	7%
SA Power Networks	1 955.7	3 000	1 955.7	1 044.3	65%
TOTAL	2 765.8	13 000	2 765.8	6 493.4	21%

Source: AER analysis and DMIA reports submitted by DNSPs; numbers may not be exact due to rounding.

Table 3 TAS DNSP DMIA expenditures for the 2012–13 to 2016–17 regulatory control period ($' 000, nominal)

DNSP	DMIA approved for 2015–16	Total DMIA allowance	DMIA approved to date	DMIA remaining for the period	Proportion of approved DMIA spent
TasNetworks	237.0	2 074.2	514.8	1 559.4	25%
Total	237.0	2 074.2	514.8	1 559.4	25%

Source: AER analysis and DMIA reports submitted by DNSPs; numbers may not be exact due to rounding.

Table 4 VIC DNSPs DMIA expenditures the 2016 to 2020 regulatory control period ($' 000 nominal)

DNSP	DMIA approved for 2016	Total DMIA allowance	DMIA approved to date	DMIA remaining for the period	Proportion of approved DMIA spent
AusNet Services	1 498.7	3 019.5	1 498.7	1 520.8	50%
CitiPower	-	1 006.5	-	1 006.5	0%
Jemena	110.6	1 006.5	110.6	895.9	11%
Powercor	-	3 019.5	-	3 019.5	0%
United Energy	505.5	2 013.0	505.5	1 507.5	25%
TOTAL	2 114.8	10 065.0	2 114.8	7 950.2	21%

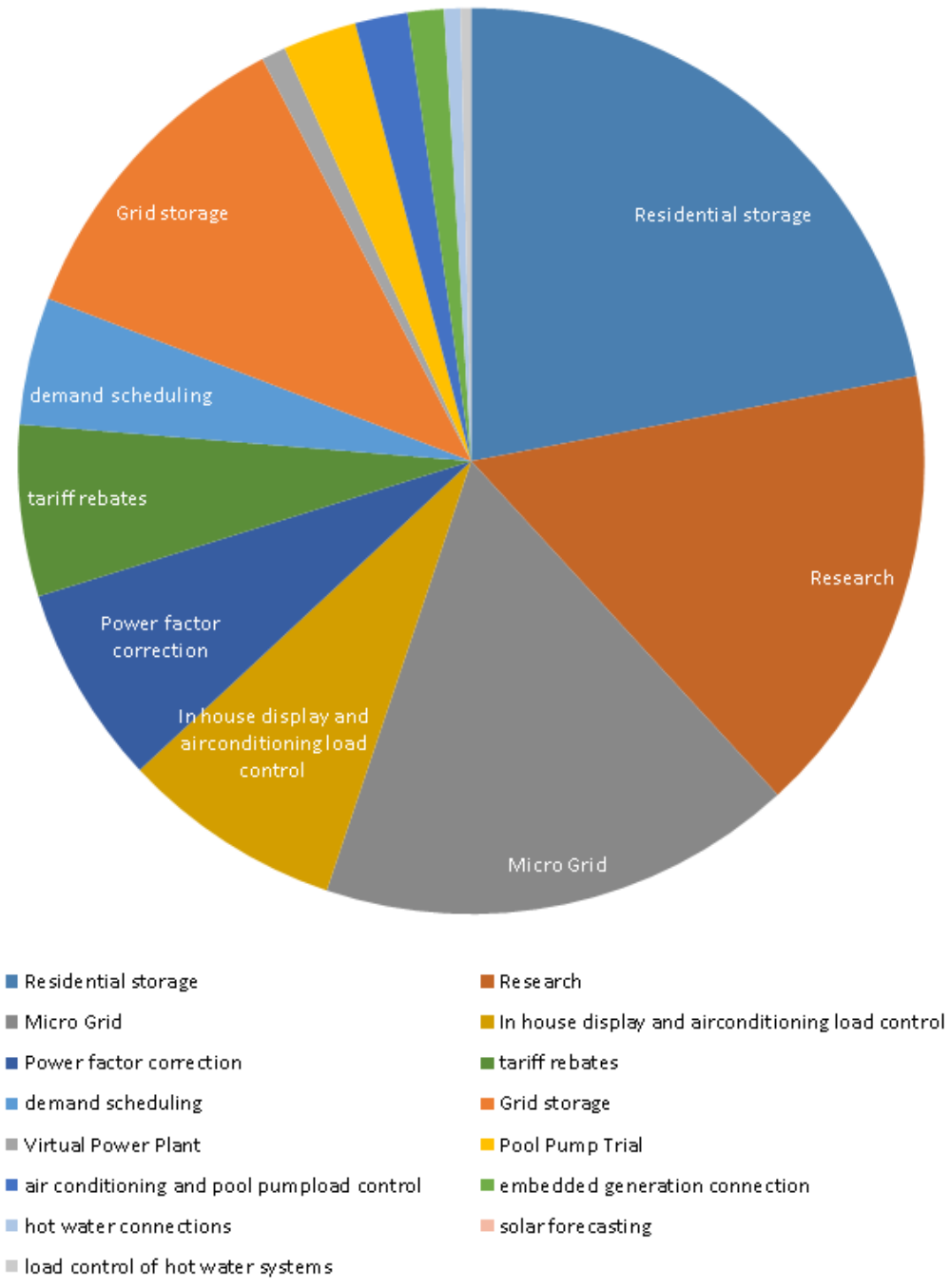
Source: AER analysis and DMIA reports submitted by DNSPs; numbers may not be exact due to rounding.

Figure 2 summaries the types of projects provided under the DMIA. The greater the expenditure on a project type the larger the chart area. The projects undertaken vary considerably in both their nature and scale. For example, there were a few tariff based projects designed to incentivise customers to reduce their usage at times of peak demand, but the majority of the projects were non-tariff based. These projects included:

- various trials of technologies with the potential to reduce and/or shift demand through equipment/device control
- improving the storage of renewable energy generated during non-peak times for subsequent use during peak periods

- improving power factor correction to reduce the amount of electricity that requires transportation across a distribution network and
- load control options which result in shifting load to non-peak times.

Figure 2 Breakdown of expenditure by project type



Source: AER analysis and DMIA reports submitted by DNSPs

Structure of the report

The remainder of the report is structured as follows:

Chapter 1 provides background information about the DMIS and DMIA.

Chapter 2 provides the criteria contained in the DMIS, against which the AER is required to assess claims for the DMIA each year.

Chapter 3 provides a summary of our annual DMIA compliance assessment results of all DNSPs' DMIA reports and supporting information.

Chapters 4 to 16 of the report provide the detailed assessment of all DNSPs' DMIA expenditure claims against the criteria contained in the DMIS.

1 Background

The Demand Management Incentive Scheme (DMIS) is a research and development fund which aims to provide incentives for Distribution Network Service Providers (DNSPs) to conduct research and investigation into innovative techniques for managing demand. The AER published its DMIS for the non-Victorian DNSPs (in October and November 2008) and Victorian DNSPs (in April 2009) in accordance with clause 6.6.3 of the National Electricity Rules (NER).

The Demand Management Innovation Allowance (DMIA) is part A of the DMIS. DMIA is provided to a DNSP in the form of a fixed amount of additional revenue at the commencement of each year of the regulatory period. As part of its distribution determination the AER has previously approved the allowances in accordance with Part A of the DMIS.

In the second year of the next regulatory control period, when results for the five years of the current regulatory control period are known, a single adjustment will be made to return the amount of any underspends or unapproved DMIA amounts to customers. This ensures that the scheme remains neutral in terms of the expenditure profile which the DNSP adopts during the regulatory control period.

Part B of the DMIS relates to foregone revenue. It allows DNSPs to recover foregone revenue in a regulatory control period resulting from a reduction in the quantity of energy sold directly attributable to demand management projects or programs approved under Part A of the scheme.

A key objective of the DMIS is to assist in enhancing industry knowledge of practical demand management projects and programs through the annual publication of DMIS reports from DNSPs. As such, the DMIS sets out annual reporting requirements for DNSPs for the regulatory control period. DNSPs are required to submit a report to the AER on their DMIS expenditure shortly after the end of each regulatory year, providing details of the initiatives that have been introduced. The information provided in a DNSP's annual DMIS report is used in the AER's assessment of a DNSP's compliance with the DMIA criteria and entitlement to recover expenditure under the DMIA. It also provides information to stakeholders more broadly on the nature of the innovation projects that may ultimately be progressed to more mature investments, and facilitate the participation of non-network providers for those projects that go beyond the research or testing phase.

2 Demand Management Incentive Scheme Criteria

The AER is required to assess claims for the DMIA against the criteria contained in the DMIS each year. The DMIA criteria are:

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.

Criteria #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 in 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.

Criteria #3: Demand management projects or programs may be innovative, and designed to build demand management capability and capacity and explore potentially efficient demand management mechanisms, including but not limited to new or original concepts.

Criteria #4: Recoverable projects and programs may be tariff or non-tariff based.

Criteria #5: Costs recovered under this scheme:

a. must not be recoverable under any other jurisdictional incentive scheme

b. must not be recoverable under any other state or Australian Government scheme

c. must not be included in forecast capital or operating expenditure approved in the distribution determination for the regulatory control period under which the scheme applies, or under any other incentive scheme in that determination.

Criteria #6: Expenditure under the DMIA can be in the nature of capex or opex.

3 DMIA Assessment

3.1 Annual DMIA Assessment

We conducted our DMIA compliance assessments based on the DMIA reports (for the 2014–15, 2015–16 financial years and 2016 calendar year as applicable) and responses to further information requests received from the following DNSPs:

- ActewAGL (for 2014–15 and 2015–16 financial years - 2 years into regulatory period)
- Ausgrid (for 2014–15 and 2015–16 financial years 2 years into regulatory period)
- AusNet Services (for 2016 calendar year - 1 year into regulatory period)
- CitiPower (for 2016 calendar year - 1 year into regulatory period)
- Endeavour Energy (for 2014–15 and 2015–16 financial years - 2 years into regulatory period)
- Essential Energy (for 2014–15 and 2015–16 financial years - 2 years into regulatory period))
- Ergon Energy (for 2015–16 financial year - 1 year into regulatory period)
- Energex (for 2015–16 financial year - 1 year into regulatory period)
- Jemena (for 2016 calendar year - 1 year into regulatory period)
- Powercor (for 2016 calendar year - 1 year into regulatory period)
- SA Power Networks (for 2015–16 financial year - 1 year into regulatory period)
- TasNetworks (for 2015–16 financial year 4 years into regulatory period)
- United Energy (for 2016 calendar year - 1 year into regulatory period)

The expenditure of the distributors, compared to their DMIA allowances, varied widely. Most distributors are only one or two years into their new 5 year regulatory control period, so comparisons with their total allocations should be treated cautiously. However, of the 13 distributors reviewed, Ausgrid, AusNet Services and SA Power Networks are on track to spend their allocation, while TasNetworks spent only 25 per cent of their allocation, by the time of the fourth year of their (previous) five year regulatory period covered by this report.[3]

[3] TasNetworks distribution is now in its first year of the new regulatory period, but the report relates to year 4 of its previous regulatory period.

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TOTAL	2 114.8	10 065.0	2 114.8	7 950.2	21%

Source: AER analysis and DMIA reports submitted by DNSPs; numbers may not be exact due to rounding.

4 ActewAGL

We have approved ActewAGL's DMIA expenditure of $72,810 for two projects in 2014-15 and $37,568 for one ongoing project in 2015-16. The two demand management projects meet the DMIA criteria. The following section sets out our assessment of the projects. For more detailed information about the projects, please refer to ActewAGL's 2014-15 and 2015-16 DMIA reports which are published separately on AER's website.

Projects undertaken in 2014–15

4.1 Power Factor Project overview

ActewAGL Distribution has investigated the impact of power factor correction at low voltage customer premises on distribution network demand since 2010-11. This programme was completed in 2014-15. The project aimed to reduce demand for standard control services for large commercial customers who record 15 minute interval consumption data across its network. It included the installation of power factor correction equipment at 48 customer premises and has resulted in approximately 2,270 kVA reduction in maximum demand across the network.

ActewAGL claimed DMIA expenditure of $13,454 in 2014-15.

4.1.1 Assessment against DMIA criteria

Criteria #1 This project is a measure undertaken by ActewAGL to reduce peak demand on commercial feeders. The project aims to reduce demand for standard control services by identifying customers for whom suitable power correction equipment may be installed.

Criteria #2 This is a broad-based demand management project that targets large commercial users.

Criteria #3 This project will explore potentially efficient demand management mechanisms in terms of power factor correction equipment installation in existing premises

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

4.2 Domestic Distributed Battery Storage Project overview

ActewAGL Domestic Distributed Battery Storage project was conducted in 2014-15 and 2015-16, and will continue in 2016-17. The project aims to quantify the shift in demand that can be obtained through the use of domestic batteries.

ActewAGL claimed DMIA expenditure of $59,356 in 2014-15 and $37,568 in 2015-16.

4.2.1 Assessment against DMIA criteria

Criteria #1 The project is a measure undertaken by ActewAGL to assess the impact on network load from customer and network management of battery storage distributed at a residential level.

Criteria #2 This is a broad-based demand management project that targets domestic users.

Criteria #3 This project will potentially promote efficient demand management through the use of distributed storage at a domestic scale.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5 Ausgrid

We approve DMIA expenditure of $1,362,980 in 2014-15 for 11 projects, and $599,692 in 2015-16 for 13 projects, because they meet the DMIA criteria. The following section sets out our assessment of the individual projects. For more detailed information about these projects, please refer to Ausgrid's 2014-15 and 2015-16 DMIA reports which are published separately on AER's website.

Projects undertaken in 2014–15

5.1 Dynamic peak rebate for non-residential customers

5.1.1 Project overview

The Dynamic Peak Rebate (DPR) trial provided a financial incentive for medium to large non-residential customers to reduce their demand during the summer peak demand period on the 5-10 days of the year when network assets are operating at maximum demand. The DPR approach allows the customer to discover their own least cost demand reduction to supply reductions for network deferral or minimise load at risk. Ausgrid claimed DMIA expenditure in 2014-15 of $79,415 for this project.

5.1.2 Assessment against DMIA criteria

Criteria #1 Reducing peak demand through using demand reduction can help defer the need for network augmentation.

Criteria #2 This is a peak demand management project.

Criteria #3 Dynamic peak rebate is part of an efficient demand management strategy.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

Projects undertaken in 2014–15 and 2015–16

5.2 Cool Saver Maitland Program

This is a new project that will trial and assess lower cost models for customer acquisition to air conditioners demand management programs. The project will assess the effectiveness and verify the viability of establishing new sales channels for demand management compliant air conditioner products through leveraging point of sale channels of the air conditioner industry, installers and appliance retail stores. It will

also collect and analyse data to determine demand reduction performance, customer acceptance and technology performance.

Ausgrid claimed DMIA expenditure of $442,807 in 2014-15 and $205,673 in 2015-16 for this project, which is still ongoing.

5.2.1 Assessment against DMIA criteria

Criteria #1 The project is exploring whether a previously trialled, low cost method for obtaining residential customer/air conditioner participation is effective in a limited metropolitan area, defined by network constraints.

Criteria #2 This is a peak demand project.

Criteria #3 This project satisfies this condition as it explores the market potential for a low cost, demand management mechanism which uses technology known to be effective.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.3 Non-residential energy efficiency program

5.3.1 Project overview

This is a new project that aims to trial alternative cost-effective methods of facilitating and/or incentivising non-residential customers to implement energy efficiency improvements that are additional to baseline energy efficiency activity and therefore result in additional peak demand reductions. One of the aims of the project will be to measure and verify the peak demand reductions achieved above baseline activity.

Ausgrid claimed DMIA expenditure of $19,294 in 2014-15 and $20,151 in 2015-16 for this project, which is still ongoing.

5.3.2 Assessment against DMIA criteria

Criteria #1 The project investigates the potential of energy efficiency activities by non-residential customers to reduce peak demand.

Criteria #2 This is a broad–based demand management project that targets non–residential customers.

Criteria #3 This condition is satisfied since the project investigates techniques that may offer innovative ways to increase demand management capabilities.

Criteria #4 Non–tariff based.

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.4 Dynamic Load Control of Small Hot Water Systems

5.4.1 Project overview

This project is aimed at trialling a load control option for small and medium sized hot water systems. To do this, between five and ten days per year the electricity supply to participating customers' water tanks was turned off for three to five hours.

Ausgrid claimed DMIA expenditure in 2014–15 of $7,027 and in 2015-16 of $24,698 for this project.

5.4.2 Assessment against DMIA criteria

Criteria #1 Reducing peak demand through using load control can help defer the need for network augmentation.

Criteria #2 This is a peak demand management project.

Criteria #3 Load control options are part of an efficient demand management strategy.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.5 Subsidised Off-peak Hot Water Connections

5.5.1 Project overview

This project involves connecting the hot water systems of low income and vulnerable households to off peak electricity supply. This is a joint collaboration with NSW Land and Housing Corporation. Ausgrid claimed DMIA expenditure in 2014-15 of $23,379 and in 2015-16 of $25,287 for this project.

5.5.2 Assessment against DMIA criteria

Criteria #1 This project aims to shift hot water loads to off peak times and by doing so helps reduce peak demand and defer network augmentation.

Criteria #2 This is a peak demand management program.

Criteria #3 Spreading load to off-peak times to lower peak demand is part of an efficient demand management strategy.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because Ausgrid have confirmed that expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex.

5.6 CBD embedded generator connection

5.6.1 Project overview

This project aimed to develop, design and test an alternative embedded generator connection in the Sydney CBD that addresses the potential fault level and feeder imbalance issues which are considered to be potential barriers to their widespread uptake in these types of network locations. Ausgrid claimed DMIA expenditure in 2014-15 of $37,130 and in 2015-16 of $1,767 for this project.

5.6.2 Assessment against DMIA criteria

Criteria #1 Enabling greater levels of embedded generation in the Sydney CBD which can help alleviate pressure on CBD electricity demand

Criteria #2 This is a broad-based demand management project.

Criteria #3 Better integration of embedded generation can be used as part of an effective demand management strategy.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.7 Air conditioner and pool pump load control

5.7.1 Project overview

This project involved the development of Demand Response Enabling Devices (DREDs) for air conditioners and pool pumps. It also included a customer trial where 40 "ripple DREDs" and 68 "SMS DREDs" were fitted to air conditioners. For the trial customers, dispatch events were called on 3 separate occasions during the summer

season of 2014-15 with generally positive feedback from participants. For the SMS DREDs, customers had the opportunity to override the dispatch event with no customer requesting an override.

Ausgrid claimed DMIA expenditure in 2014–15 of $83,708 and in 2015-16 of $72,915 for this project.

5.7.2 Assessment against DMIA criteria

Criteria #1 Direct load control of air conditioners and pool pumps can help lower summer peak demand. The results from this customer trial will help facilitate the take up of direct load control options.

Criteria #2 This is a peak demand management project.

Criteria #3 This research improves Ausgrid's capacity to effectively deploy these technologies that enable peak demand reductions.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.8 Grid Battery Trial

5.8.1 Project overview

This project investigated the potential benefits of using network grid-side battery storage as a means for reducing peak demand on the network with a trial over the 2014–15 summer period. The trial tested for reliability, quality and effectiveness at reducing summer peaks. It will also look into optimum battery management and control methodologies.

Ausgrid claimed DMIA expenditure in 2014–15 of $331,268 and in 2015-16 of $65,108 for this project.

Ausgrid stated trial results have shown that grid based energy storage can be a viable solution to managing network demand once the product matures and energy storage costs fall. In addition to a lower cost per Megawatt-hour of storage capacity, improvements to system reliability will be required to compete with existing alternative demand management solutions.

As the trial was relatively modest in scale and temporary in nature, there are no permanent, material peak demand reductions achieved from this project. The trial activities did not form part of any actual deferral of a real network need.

5.8.2 Assessment against DMIA criteria

Criteria #1 This is a trial of network grid-side battery storage (rather than domestic storage) that can be drawn on to help reduce peak demand (and in turn avoid network augmentation).

Criteria #2 This is a peak demand project.

Criteria #3 Grid batteries are an innovative technology that has the potential to improve Augrid's demand management capability.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.9 Controlled Load 2 summer scheduling

5.9.1 Project overview

Ausgrid currently has around 160,000 customers on their Controlled Load 2 tariff (Off Peak 2), predominantly controlling domestic hot water systems. This tariff was originally intended for shifting load outside of peak times in the winter period but summer peaks are becoming the predominant driver for much of Ausgrid's growth related network investment.

This project involved trialling a new summer load control schedule for summer peak reduction for customers with Controlled Load 2 tariffs. The main objective of the trial is to investigate the potential issues and barriers for implementing a summer scheduling regime for Controlled Load 2 customers across the whole network. Ausgrid claimed DMIA expenditure in 2014-15 of $71,540 and in 2015-16 of $27,572 for this project.

5.9.2 Assessment against DMIA criteria

Criteria #1 This project meets this requirement as it shifts load outside of peak times which will lower peak demand reduce the need for network augmentation.

Criteria #2 This is a peak demand management project.

Criteria #3 This project satisfies this condition as it explores a potentially efficient demand management mechanism (reducing the impact of hot water systems at times of peak demand through load control).

Criteria #4 Non-tariff based, though the project involves trialling a variation in the load control schedule of an existing control load tariff. Under this project, customers will

have less hours of electricity supply for their controlled load 2 electricity supply during the summer months.

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.10 Large customer power factor correction

5.10.1 Project overview

Power factor correction at customer premises lowers the peak demand in kVA and reduces the electrical infrastructure requirements for networks. This project examined the incentives required to encourage medium to large customers whose power factor is below the network standard during peak periods to install power factor correction equipment. Ausgrid claimed DMIA expenditure in 2014-15 of $264,636 and in 2015-16 of $106,120 for this project.

5.10.2 Assessment against DMIA criteria

Criteria #1 By correcting the customer's power factor, the kVA demand from customers is reduced.

Criteria #2 This project can help to improve energy efficiency overall (i.e. broad-based demand management) as well as be useful in managing peak demand as Ausgrid is proposing to target customers in areas that have network constraints.

Criteria #3 Encouraging power factor correction is a useful tool to manage demand.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.11 Pool pump demand study

This is a new project that aims to investigate the diversified load contribution of existing pool owners and to trial a rebate to customers who purchase and install an energy efficient pool pump. It also incorporates a study into the reduction in diversified summer peak demand that is achievable when an energy efficient pool pump is installed. Ausgrid claimed DMIA expenditure in 2014-15 of $2,780 and in 2015-16 of $19,534 for this project, which is still in the development stage.

5.11.1 Assessment against DMIA criteria

Criteria #1 The project investigates methods to install energy efficient pool pumps which may help reduce summer peak demand, and hence the need for network augmentation.

Criteria #2 This is a peak demand project.

Criteria #3 This project satisfies this condition as it explores a potentially efficient demand management mechanism (offering rebates to customers that purchase and install energy efficient pool pumps).

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

Projects undertaken in 2015–16

5.12 Solar and Battery Customer Research

This is a new project that involves conducting a survey of customers, focusing on solar and battery systems. The research is aimed at increasing understanding of the purchasing motivations of customers and the potential future uptake of solar and battery systems.

Ausgrid claimed DMIA expenditure in in 2015-16 of $8,513 for this project, which is still at the preliminary stage.

5.12.1 Assessment against DMIA criteria

Criteria #1 The project investigates customers interest in and likely take up of battery systems. Installation of battery systems may help reduce summer peak demand, and hence the need for network augmentation.

Criteria #2 This is a peak demand project.

Criteria #3 This project satisfies this condition as it explores the potentially take-up of a technology which may be of use as a demand management mechanism.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.13 DMIA Stakeholder Engagement

This project will formally consult with Demand Management (DM) stakeholders to identify new and innovative DM solutions for potential Ausgrid Demand Management Innovation Allowance (DMIA) trials. Ausgrid claimed DMIA expenditure in 2015-16 of $10,581 for this project, which is still in the development stage.

5.13.1 Assessment against DMIA criteria

Criteria #1 The project aims, through formal consultation with DM stakeholders, to discover new and innovative DM solutions which might form potential cost effective demand management solutions for deferral of network investment.

Criteria #2 This is a broad-based demand project.

Criteria #3 This project satisfies this condition as it explores potentially efficient demand management mechanisms and the development of new concepts.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

5.14 Winter Air Conditioner Load Control

This is a new project involves making a winter air conditioner load control offer to existing demand management trial participants who are currently taking part in the Central Coast Cool Saver trial. The aim of the project is to test the viability of a residential winter peak demand reduction program focused at reducing the electrical load from air conditioners used for heating.

Ausgrid claimed DMIA expenditure in 2015-16 of $11,753 for this project, which is still in the development stage.

5.14.1 Assessment against DMIA criteria

Criteria #1 The project investigates the viability of a residential winter peak demand reduction program focused at reducing the electrical load from air conditioners used for heating, which may help reduce the winter peak demand affecting 20 per cent of Ausgrid's zone substations.

Criteria #2 This is a peak demand project.

Criteria #3 This project satisfies this condition as it explores the potentially of a demand management mechanism.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

6 AusNet Services

AusNet Services is claiming 2016 DMIA expenditure for two demand management projects totalling $1 498,708. We approve this expenditure as it meets the DMIA criteria. The following section sets out our assessment of the individual projects. For more detailed information about these projects, including any identifiable benefits derived from the projects, please refer to AusNet Services' 2016 DMIA report which is published separately on AER's website.

6.1 Mooroolbark Community Mini Grid Trial

6.1.1 Project Overview

The project encompasses the design, build and operation of a 16 house mini grid in Mooroolbark that will be monitored and controlled by a cloud based mini grid control system that can implement (Distribution System Operator) DSO control functions and algorithms. The project aims to:

- understand the full value potential of concentrated and controllable distributed energy resources (DER) in providing demand management and network support, as well as the techniques to achieve this;
- develop strategies to manage an increasing level of customer-driven DER; and
- learn how to facilitate community driven energy initiatives such as renewable energy projects and micro grids in a way that is not only efficient, but is beneficial to the network.

The project will also test the performance of DER systems in providing backup supply to individual customers in case of network outage, and also the ability for the mini grid as a whole to operate as an island (grid-separated mode) for short periods of time, with sharing of power between customers in order to maintain system stability and longevity. AusNet Services claimed DMIA expenditure in 2016 of $1 421,230 for this project.

Criteria #1 Using coordinate distributed energy resources provides network peak demand reduction, reduce energy at risk and potentially defer asset augmentation and increases supply reliability by providing islanded supply to customers during outages.

Criteria #2 This is a peak demand management program.

Criteria #3 This trial project will test the technical viability of the mini grid to demonstrate these benefits, test the customer appetite and acceptance, and evaluate the economic viability of different structures of mini grids and community energy projects. The learning of the project will ultimately help build AusNet Services' toolkit for delivery of non-network and demand-side solutions. However, if the services provided were unregulated, at commercial scale, AusNet Services would need to provide this through a legally separate entity.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Capex

6.2 Grid Energy Storage System (GESS) Trial

6.2.1 Project Overview

In 2012, AusNet Services initiated a Grid-scale Energy Storage System (GESS) project to trial the use of a large battery storage system to defer asset augmentation by managing peak demand and explore other benefits of storage systems to network management. The GESS will shift demand on a particular feeder from peak to off-peak times by discharging during feeder peaks and re-charging overnight when the feeder demand is low. In practice, the GESS is suited to addressing a specific network constraint and is containerised to allow portability to different locations as required. AusNet Services claimed DMIA expenditure in 2016 of $77,478 for this project.

Criteria #1 Using large-scale storage connected at grid-level enables AusNet Services to defer asset augmentation, reduce the risk of asset overloads, improve power quality and mitigate the risk of customer outages.

Criteria #2 This is a peak demand management program.

Criteria #3 The trial will provide AusNet Services practical experience to better understand and assess the level of network value of grid-scale energy storage. This trial will help to establish whether battery storage is a credible non network solution to managing demand and set the parameters around when it can be economically deployed for the benefit of energy consumers.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

7 CitiPower

No projects reported in 2016 and no innovation allowance claimed for this period.

8 Endeavour Energy

We approve DMIA expenditure of $378,787 for two projects in 2014-15 and $30,635 for a further two projects in 2015-16 because they meet the DMIA criteria. One of the 2014-15 projects is a continuing project which has already been approved by the AER. The following section sets out our assessment of the individual projects. For more detailed information about each project, please refer to Endeavour Energy's 2014-15 and 2015-16 DMIA reports which are published separately on AER's website.

Projects undertaken in 2014–15

8.1 Power Factor Control (PFC) Trial

8.1.1 Project overview

This PFC trial was implemented to determine the benefits of a broad based PFC program, to assess the level of financial incentive required to motivate the customer to install PFC, and to develop a proposal for a broad based PFC program for the 2015-19 period with an appropriate budget. Endeavour Energy claimed DMIA expenditure in 2014–15 of $181,103 for this project.

8.1.2 Assessment against DMIA criteria

Criteria #1 This project investigates the feasibility and benefits of a broad based PFC program and was conducted to assess the level of financial incentive required to motivate the customer to install PFC, the installation of which will potentially decrease network demand.

Criteria #2 This project is a broad-based demand management project.

Criteria #3 This project explores how a PFC program can be implemented, the financial incentives required for the program and the potential benefits of resulting PFC for reducing demand on the network.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

8.2 Pool pump trial

This is an ongoing project which trials methods for allowing customers to switch their pool pump from a "Domestic" to a "Controlled Load 2" supply tariff. The trial's main objectives are to quantify peak demand reduction, investigate when customers use their pool pumps, and to identify the costs associated with controlled load conversion.

To facilitate switching, customers were offered a $150 financial incentive and a reduction in the energy costs incurred by pool pump operations—which could lead to savings of several hundred dollars. Endeavour Energy claimed DMIA expenditure in 2014-15 of $197,684 for this project.

8.2.1 Assessment against DMIA criteria

Criteria #1 The control of pool pumps through the Control Load 2 circuit could help reduce summer peak demand, which may reduce the need for network augmentation.

Criteria #2 This project is a peak demand management project.

Criteria #3 This project explores customer pool pump usage behaviour and the control of pool pumps through the Control Load 2 circuit.

Criteria #4 Both tariff and non-tariff incentives

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 $94,990 Opex and $102,694 capex

Projects undertaken in 2015–16

8.3 DM Education and Recruitment Webpages

This is a new project which involves the development of new web pages, under the section ‘Saving energy’ of the website Endeavour Energy’s corporate website. These webpages contain information to customers regarding the effects of peak demand on the Endeavour network, how to minimise peak demand and results from past DM programs, as well as energy saving tips.

Endeavour Energy claimed DMIA expenditure in 2015-16 of $11,936 (opex and capex) for this project, covering the following costs

- Development of the hot water, pool pump and cooking calculators by an external IT supplier, and
- Copywriter to perform a rewrite of the additional webpages’ content and rebrand the three energy usage calculators.

8.3.1 Assessment against DMIA criteria

Criteria #1 The development new webpages containing information regarding the effects of peak demand on the Endeavour network, and how to minimise peak demand and results from past DM programs, may reduce the need for network augmentation.

Criteria #2 This project is a broad-based demand management project.

Criteria #3 This project aims to encourage customers to undertake energy efficiency and demand management actions.

Criteria #4 Non-tariff incentives

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 $5,654 opex and $6,282 capex

8.4 Ripple Control Development

This project aims to test a new ripple protocol (Swistra) that has the ability to send on/off commands, reassign or remotely reprogram receivers in managing demand management (DM) programs, such as hot water load, energy storage and electric vehicle charging This becomes more important in managing future demand management programs with new customer appliances such as energy storage and electric vehicle charging.

Project scope includes validating the functionality available with the Swistra ripple protocol for DM and control of additional loads (i.e. Electric Vehicles); developing the Swistra mapping which could be applied for the wider Endeavour Energy network for DM, and catering for the future control of electric storage and vehicles. Further technical details on this project are in Endeavour's DMIA report. Endeavour Energy claimed DMIA expenditure in 2015-16 of $18,699 for this project.

8.4.1 Assessment against DMIA criteria

Criteria #1 The validation of the functionality available with the Swistra ripple protocol system for Demand Management (DM), and control of additional loads (i.e. Electric Vehicles) may be a useful step in improving the demand management capability of the Endeavour network.

Criteria #2 This project is a peak load focused demand management project.

Criteria #3 This project aims to validate the functionality available with the Swistra ripple protocol for demand management and develop the Swistra mapping which could be applied for the wider Endeavour Energy network.

Criteria #4 Non-tariff incentives

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Capex

9 Essential Energy

Essential Energy is claiming 2014–15 DMIA expenditure $502,741 for three demand management projects and 2015-16 $266,750 for four projects, three of which are continuation of 2014-15 projects. We approve this expenditure as it meets the DMIA criteria. The following section sets out our assessment of the individual projects. For more detailed information about these projects, please refer to Essential Energy's 2014–15 and 2015-16 DMIA reports which are published separately on AER's website.

Projects undertaken in 2014-15 and 2015–16

9.1 Grid Interactive Inverter program - 20kVA four quadrant inverter

9.1.1 Project overview

This ongoing project is a grid interactive inverter program involving research, development and field testing of four quadrant inverters which can be used to avoid or defer network augmentation in low and medium voltage distribution networks. Following field trials in previous years, further monitoring and assessment of benefits have occurred in 2014–15, and optimising of control techniques in 2015-16. However, no further costs or investment was specifically recorded against this project as the work conducted was funded via the 5kVA Grid Interactive Inverter project, due to the two projects being closely linked.

Essential Energy claimed total DMIA expenditure $28, 608 in 2015-16 for both projects. No DMIA expenditure was claimed in 2014-15 for 20kVA Grid Interactive Inverter project.

9.1.2 Assessment against DMIA criteria

Criteria #1 This project involves testing four quadrant inverters, which are an enabling technology for energy storage, and reactive power support which has the potential to shift/reduce demand at peak times rather than relying on network augmentation.

Criteria #2 This is a peak demand management program.

Criteria #3 This project explores innovative technologies to build demand management capability and capacity.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex and Capex

9.2 Grid Interactive Inverter program 5kVA based

9.2.1 Project overview

This project builds on the 'Grid Interactive Inverter program 20kVA based'. The 5kVA project focuses on developing this technology for use at a residential level to avoid or defer network augmentation at this level of the network. During 2012–13, a number of 5kVA four quadrant inverters were tested at the Clearwater Zone Substation in Port Macquarie, then returned to the manufacturer for upgrading during 2013-14 and re-deployed during 2014-15. In 2015-16 further work on optimising control techniques was undertaken.

Essential Energy claimed $2,039 DMIA expenditure for this project in 2014–15, and total $28,608 for 2015-16 for this project and 20 kVA programs.

9.2.2 Assessment against DMIA criteria

Criteria #1 Unlike the 20kVA based project which is used at the network level, the 5kVA inverters are developed to use at the residential level to support renewable generation connections while minimising adverse impacts to the distribution network.

Criteria #2 The technology explored in this project can be used in broad-based demand management programs and to address specific network constraints.

Criteria #3 This project explores innovative technologies to build demand management capability and capacity.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project cannot be recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex and capex

9.3 Conservation voltage reduction through low voltage regulators

Conservation voltage reduction is a lowering of voltage at the customer connection point in order to increase end use efficiency, lower peak demand, lower energy use and decrease losses without adversely affecting power quality. It is also known as voltage optimisation. Project activities in 2014–15 include hardware and software revisions and testing of three phase low voltage regulators by appropriately qualified staff, which was completed late in 2014-15. Installation and field trial testing occurred in late 2014-15 and 2015-16.

Essential Energy claimed DMIA expenditure $205,728 in 2014–15 and $142,786 in 2015-16 for this project.

9.3.1 Assessment against DMIA criteria

Criteria #1 Low voltage regulators have the potential to support voltage at times of peak demand, potentially reducing the need to network augmentation and also can help conserve energy.

Criteria #2 The technology explored in this project can be used in broad-based demand and peak demand management program.

Criteria #3 This project explores ways to better manage demand by improving the effectiveness of existing network capacity.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project cannot be recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex and Capex

9.4 Switched reactors

This project aims to develop knowledge and test the viability of using controlled switching to defer expenditure on single wire earth return (SWER) systems. As part of this project, Essential Energy collaborated with a university based research group. It found that using "switched reactors" in combination with specifically developed algorithms can control voltage swings, a key driver of augmentation expenditure on SWER systems.

In 2013–14, Essential Energy placed orders for five switched reactors, which will allow for field testing to occur in constrained locations and in 2014-15 this was followed by data collection and results analysis. In 2015-16 the reactors were programmed to activate and operate automatically, which will enable data to be collected. The collected data has confirmed the voltage improvements expected from early simulations, with the furthest switched reactor providing the greatest benefit, reducing the network voltage along the entire feeder.

The switched reactors are currently being sent back to the manufacturer for hardware upgrades to improve the devices' resilience to lightning impulses. Once reinstalled and testing is complete, and should the anticipated benefits be reached at an efficient cost, then Essential Energy will go to market with a specification in 2016/17.

Essential Energy claimed DMIA expenditure in 2014–15 of $294,974 and in 2015-16 of $65,723 for this project.

Criteria #1 The development of switched reactors may allow Essential Energy to better manage voltage swings, which in turn can defer augmentation on SWER lines.

Criteria #2 The technology explored in this project can be used in broad-based demand and peak demand management program.

Criteria #3 This project will improve demand management capability and explore potentially efficient demand management mechanisms on SWER lines.

Criteria #4 Non–tariff based.

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex and Capex.

Projects undertaken in 2015–16

9.5 Load Control Development

A recent Essential Energy review made recommendations to improve the cost effectiveness of their existing load control system, which undertakes demand management by shifting load from peak periods into lower demand or higher generation periods, and lead to the current project.

The purpose of the project is to create a controlled load algorithm that easily identifies the potential benefit from optimising (switching routine, asset condition, etc.) the local load control assets in areas of the network under constraint. In addition, it aims to explore potential alternative load control technology with the aim of a lower cost, effective and efficient option to provide controlled load services to customers.

In 2015-16 data was collected from a Controlled Load meter and relay data linked to a sample zone substation, then a preliminary template was created to process the sample data. Optimising the Controlled Load switching algorithms and assets at the sample site has produced preliminary results that show optimisation of controlled load assets may result in a lower cost solution to address the network constraint. A request for information was also issued to explore the cost effectiveness of alternate load control technology that has the ability of time syncing without the need to install a Frequency Injection (FI) plant for areas of the network without FI coverage.

Essential Energy claimed DMIA expenditure $29,633 in 2015-16 for this project.

Criteria #1 The attempt to create a controlled load algorithm, that identifies the benefit from optimising the local load control assets, could potential improve Essential Energy's ability to manage demand and reduce the need for network augmentation.

Criteria #2 The technology explored in this project could be used in peak demand management programs.

Criteria #3 This project has the potential to improve demand management capability through improving the utilisation of existing load control facilities.

Criteria #4 Non–tariff based.

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex.

10 Energex

Energex is claiming 2015–16 DMIA expenditure for four demand management projects totalling $472,407. We approve this expenditure as it meets the DMIA criteria. The following section sets out our assessment of the individual projects. For more detailed information about these projects, please refer to Energex' 2015–16 DMIA report which is published separately on AER's website.

10.1 Small Business Customer Load Profile Market Segmentation Project

10.1.1 Project overview

This project is aimed to inform the development of the demand tariff and network pricing strategy. This requires the use of load data at a sufficient disaggregated level. However, load data was only available at a network element level and knowledge of the impacts of a future demand tariff on different small business customer segments and load profiles was limited. Energex therefore engaged an external service provider to formulate small business customer load profiles, collated into identified low voltage (LV) customer market segments to allow an evaluation of the impact of these tariffs on this customer cohort.

Energex claimed DMIA expenditure in 2015–16 of $ 250,833 for this project.

10.1.2 Assessment against DMIA criteria

Criteria #1 The project aimed to produce detailed data, formulation of detailed customer load profiles and modelling of demand impacts. These in turn are expected to assist in the development of demand tariffs which are aimed at encouraging reductions in network peak demand.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project results will feed into the development of better designed demand tariffs, that may help avoid network augmentation.

Criteria #4 Tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

10.2 Battery Energy Storage Systems (BESS) Pilot

10.2.1 Project overview

This project involves Energex conducting BESS trials over four years to better understand the impact of BESS on the network and how BESS can enable a higher penetration of solar PV. The data obtained from these trials will assist in developing systems to manage new technologies, including battery systems, and provide cost-effective outcomes for Queenslanders.

We note that Energex received a temporary waiver from Queensland Ring Fencing Guidelines for this project. The waiver is conditional on Energex not selling electricity injected into the network. The waiver will remain in place until December 2017, 12 months after we release the new national ring fencing guidelines.[4]

Energex claimed DMIA expenditure in 2015–16 of $207,052 for this project.

10.2.2 Assessment against DMIA criteria

Criteria #1 This project aims are to gain a better understanding on the customer value proposition and expectations from the electricity network in taking up BESS; how Energex can leverage off the existing load control system with direct load control and tariffs to benefit both Energex and the customer; and will investigate how the BESS technology will integrate with the electricity network, which could potentially be used for peak load management.

Criteria #2 This is a broad-based demand management program.

Criteria #3 By testing the capabilities and characteristics of BESS, Energex can investigate its demand management effectiveness, that may help avoid network augmentation.

Criteria #4 Non-tariff based.

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

[4] https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/ring-fencing-waivers/energex-ring-fencing-waiver-2015.

10.3 Real Time Tariff Study

10.3.1 Project overview

Energex introduced new electricity tariffs on 1 July 2016 which are demand based, have a time of use structure and will encourage emerging technologies such as battery storage to connect to the electricity network. The Real Time Tariff Study's scope is to research the impact of the new demand tariffs and complimentary Smart Control tariffs on small, low voltage customers, and how educational and promotional materials can be used to increase demand tariff adoption.

Energex claimed DMIA expenditure in 2015–16 of $9,090 for this project.

10.3.2 Assessment against DMIA criteria

Criteria #1 This project aimed to research the impact of the new demand tariff and complimentary Smart Control tariff on small, low voltage customers, and how educational and promotional materials can be used to increase demand tariff adoption.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project aimed to improve and increase the adoption of the demand tariff, which may help in peak load management and so avoid network augmentation.

Criteria #4 Tariff based.

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

10.4 Low Voltage Network Power System Static-State Estimation

10.4.1 Project overview

The proposed project is to develop, implement and test an innovative state estimation algorithm for monitoring low voltage electricity distribution networks. This algorithm will form the basis for coordinating demand and Distributed Generation with respect to operational limits of local network segments. A 'static state estimator' can provide a basis for an autonomous low-voltage network management and monitoring system. The project is to operate for three years.

Energex claimed DMIA expenditure in 2015–16 of $5,432 for this project.

10.4.2 Assessment against DMIA criteria

Criteria #1 The project aims to produce improved data and information through the application of an estimator, which can then be used to improve the benefits of demand management and coordination of Distributed Generation across the low voltage network.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project has the potential to improve the effectiveness of demand management mechanisms, that may help avoid network augmentation.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

11 Ergon Energy

Ergon Energy is claiming $337,729 DMIA expenditure for ten demand management projects for 2015-16. We approve these expenditures as they meet the DMIA criteria. Three of these projects have received co-contributions from partners.[5] Seven projects were continuing and three were new projects. The following section sets out our assessment of the individual projects. For more detailed information about these projects, please refer to Ergon Energy's 2015-16 DMIA report which is published separately on AER's website.

11.1 Urban Statcom

11.1.1 Project overview

The increasing prevalence of residential photovoltaic (PV) systems and non-linear loads is starting to have a significant impact on network and customer supply. These impacts include over-voltage and voltage swings on the low voltage network, affecting customer loads, causing PV systems to trip off (reducing output) and necessitating (partially effective and expensive) network augmentation and potential restriction of PV system connection. This project laboratory tests and field trials two different products from different manufacturers in order to mitigate these problems including lower cost, more effective alternatives to network augmentation.

Product 1 is a single phase 10kVAR capacitive only type of unit, which can address out of balance voltages. Product 2 is a three phase 20kVAR Statcom that can act as both a capacitor and inductor.

Ergon Energy claimed DMIA expenditure of $29 in 2015–16 for this project, which is now closed.

11.1.2 Assessment against DMIA criteria

Criteria #1 This project provides solutions and products, including lower cost, more effective alternatives to network augmentation, to mitigate impacts from residential PV systems and non-linear loads.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project will lead to improved low voltage supply quality and allow for increasing amount of PV without the need for network augmentation.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor

[5] These projects include Solar Energy Management Systems, LED Streetlight system trial and ARC Customer response and risk management.

through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

11.2 Large Statcom

11.2.1 Project overview

The Large LV Statcom project will undertake a trial on a three-phase 300kVA unit on Ergon Energy networks. The main application is to support the voltage on a long medium voltage rural feeder with voltage regulation issues, partially due to higher penetration of PV, and avoid the conventional network upgrade, which may otherwise be required.

Ergon Energy claimed minor DMIA expenditure of $81 in 2015–16 for this project, which is now completed.

11.2.2 Assessment against DMIA criteria

Criteria #1 The main application is to support the voltage on a long medium voltage rural feeder with voltage regulation issues, partially due to higher penetration of PV, and avoid the conventional network upgrade, which may otherwise be required.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project will support the voltage on a long medium voltage rural feeder with voltage regulation issues, and avoid the conventional network upgrade, which may otherwise be required.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

11.3 Solar Energy Management system

11.3.1 Project overview

This project represents development of a solar system with a Solar Energy Management (SEM) controller that is capable of continuous operation, overcoming solar intermittency, displacement of electrical consumption, increasing the penetration of cost-effective renewable energy technology, and providing reliable renewable energy.

Ergon Energy claimed DMIA expenditure of $1,843 in 2015–16 for this project.

11.3.2 Assessment against DMIA criteria

Criteria #1 As a utility energy management tool the system is capable of simultaneously satisfying both renewable energy supply and electricity network demand management objectives.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project will assist in determining the opportunity to develop a solution for residential air conditioning that removes the electrical demand from the distribution network when needed.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project cannot be recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex.

11.4 Adaptive LED Streetlight Systems

11.4.1 Project overview

The Adaptive LED Streetlight Systems project will validate 'smart' lighting system performance in both laboratory and field conditions. This Adaptive LED Streetlight Systems project will validate their performance and build off previous and recent trials. Successful completion of the project will lead to a deployable product that provides benefit to public lighting customers and Ergon Energy. This project aims to demonstrate the enhanced LED light control systems ability to further increase energy and demand savings, from 60% with its current LED luminaire to 80% with the adaptive light control system.

Ergon Energy claimed DMIA expenditure of $155 in 2015-16 for this project, which is now closed.

11.4.2 Assessment against DMIA criteria

Criteria #1 This project will lead to a deployable product that provides benefit to public lighting customers and Ergon Energy.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project will demonstrate the enhanced LED light control systems ability to further increase energy and demand savings.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor

through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

11.5 Centralised Energy Storage System

11.5.1 Project overview

This project will develop and evaluate a 100kW/200kWh Centralised Energy Storage System. Stage 1 of the project has been completed and involved the procurement and commissioning of an 83kVA/200kWh energy storage system as a flexible test and development platform. This paves the way for Stage 2 of the project which involves utilising the Centralised Energy Storage System platform for the development of advanced control algorithms for network and isolated applications. The system will be tested, trialled and integrated in a controlled, generation test environment in the workshops to develop functionality and verify its effectiveness and reliability.

Ergon Energy claimed DMIA expenditure of $230,075 in 2015–16 for this project.

11.5.2 Assessment against DMIA criteria

Criteria #1 This project enables higher penetrations of customer-owned renewable generation and also develop micro-gridding functionality.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project enables higher penetrations of PV on the network using centralised energy storage.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

11.6 Demand Response System

11.6.1 Project overview

This was a capability enablement project to take the findings from previous Automated Demand Response project and develop the business as usual approach for applying the learning. The project sought to establish, at a minimum, the tendering and purchasing of a demand response system and was funded via DIMA under the category of capability enablement.

Ergon Energy claimed DMIA expenditure of $840 in 2015–16 for this project, which is now closed.

11.6.2 Assessment against DMIA criteria

Criteria #1 Automatic load control reduces demand at peak times and helps avoid the need for network augmentation.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project increases Ergon Energy's demand management capacity.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

11.7 LED Streetlight Removing Barriers

11.7.1 Project overview

This project seeks to take an innovative approach by identifying actions focused on mitigating the financial, regulatory and technical barriers to large scale deployment of LED street-lighting. The project is intended to enable Ergon Energy to significantly reduce the cost of street lighting services, reduce peak demand, network constraints, energy use and carbon emissions from the provision of street lighting.

Ergon Energy claimed DMIA expenditure of $4,421 in 2015–16 for this project, which is ongoing.

11.7.2 Assessment against DMIA criteria

Criteria #1 This project established opportunity for demand reduction through enabling the use of LED streetlights.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This is an approach that has the potential to better manage demand.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

11.8 Internet of Things (IoT) Load Control

11.8.1 Project overview

This project aims to evaluate the suitability and applicability of a Low Power Wide Area Wireless Network, belonging to the family of IoT, to provide transport services for signalling (i.e. controlling) and reporting of consumers' demand response enabling devices (DRED). It also aims to develop an end-to-end solution and evaluate it in a proof of concept deployment.

Ergon Energy claimed DMIA expenditure of $34,285 in 2015–16 for this project.

11.8.2 Assessment against DMIA criteria

Criteria #1 This project will explore the emerging IoT technologies and validate the cost, operational and technical benefits for managing consumer side devices for reducing peak demand.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project will explore the emerging IoT technologies and validate the cost, operational and technical benefits for managing consumer side devices for reducing peak demand, which may lead to deferring network augmentation.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

11.9 Feeder of the Future Research

11.9.1 Project overview

This project aims to gain a better understanding of customer loads and modelling based on individual customer metering data. To achieve this, the project will perform data analytics and machine learning techniques so that a model of customer load, based on variables such house size, temperature, solar irradiance etc., can be developed. This model will then be used to estimate the effect customer battery systems would have on overall feeder loads.

Ergon Energy claimed DMIA expenditure of $22,030 in 2015–16 for this project.

11.9.2 Assessment against DMIA criteria

Criteria #1 The project aims to develop a model of individual customer loads based on a number of relevant parameters, and to use this model to gain a better understanding

of aggregate customer load when battery systems and other modern devices are installed.

Criteria #2 This is a broad-based demand management program.

Criteria #3 The project aims to develop a model of individual customer loads based on a number of relevant parameters, and to use this model to gain a better understanding of aggregate customer load when battery systems and other modern devices are installed, which may in the future assist in the reduction of network peak demand.

Criteria #4 Non-tariff based.

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex.

11.10 ARC Customer Response and Risk Management

11.10.1 Project overview

The project is an Australian Research Council (ARC) project and, in collaboration with Queensland University of Technology (QUT), will research the customer response and risks associated with demand management, direct control of appliances and tariff signals. This project will research the customers' tolerance to changes in utility service levels, enablement of the utility to directly control appliances in the home, the application of essential services circuits and the utilisation of efficient technologies in rental properties. This research will provide a platform for Ergon Energy's future development of demand management products and the integration of tariffs with technology. Ergon Energy claimed DMIA expenditure of $43,970 in 2015–16 for this project.

11.10.2 Assessment against DMIA criteria

Criteria #1 This project will research the customer response and risks associated with demand management via direct control of appliances and tariff signals.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project will research the customer response and risks associated with demand management via direct control of appliances and tariff signals, which may lead to future network demand management and the defer of network augmentation.

Criteria #4 Tariff and non-tariff based

Criteria #5 This criteria is met because funding via the DMIA is complimentary to ARC funding for the project and there is no doubling up.

Criteria #6 Opex

12 Jemena

Jemena is claiming 2016 DMIA expenditure for four demand management projects totalling $110,604. We approve this expenditure as it meets the DMIA criteria. The following section sets out our assessment of the individual projects. For more detailed information about these projects, including any identifiable benefits derived from the projects, please refer to Jemena's 2016 DMIA report which is published separately on AER's website.

12.1 Demand Response Trial Project on 22kV Feeder BD-13 (Phase 1)

12.1.1 Project Overview

In 2015 JEN undertook a desktop study of controlling the demand of commercial and industrial customers on one of their 22kV feeders (BD-13) as a Demand Response (DR) initiative. The desktop study included high level customer screening tests, developing a draft customer DR questionnaire, network constraint analysis, hardware requirements, IT requirements and training JEN staff in signing up more customers to join the trial. The project continued into the 2016 regulatory year and included engaging commercial and industrial customers on the constrained feeder with a view to signing up enough customers to proceed to field trial in Phase 2. There was, however, not enough customer interest so the project did not proceed to field trial. Phase 1 was completed in 2016. JEN claimed DMIA expenditure in 2016 of $14,021 for this project

12.1.2 Assessment against DMIA criteria

Criteria #1 The project is aimed at developing JEN’s capabilities to reduce peak demand through customer controlled demand response projects, rather than increasing supply capacity through network augmentation.

Criteria #2 The project is a peak demand management initiative which aims to address specific network constraints by reducing demand on the network at the location and time of the constraint.

Criteria #3 The project deliverables are to prepare JEN for various elements of customer controlled demand response programs as an effective and efficient demand management solution.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

12.2 Demand Management Constraint Analysis Tool (CAT)

12.2.1 Project Overview

JEN initiated the development of a Demand Management Constraint Analysis Tool (CAT) in 2015. The software tool allows network planning engineers to undertake a consistent and objective cost benefit analysis of multiple network and non-network options. The project continued into the 2016 regulatory year and was completed in January 2016. Jemena claimed DMIA expenditure in 2016 of $29,814 for this project.

12.2.2 Assessment against DMIA criteria

Criteria #1 The tool allows network planning engineers apply a consistent approach in analysing and comparing multiple network and non-network options.

Criteria #2 The project is a broad based Demand Management cost-benefit analysis initiative, and is not aimed at a specific location on the network.

Criteria #3 The project deliverable is a software tool which can be used to develop and enhance JEN's capability in comparing and analysing multiple network and non-network options. In return to the upfront capital contribution and co-development effort, JEN can subscribe to the use of the software tool at a discounted price for the next two years after the completion of the development.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

12.3 Grid Battery Energy Storage System Feasibility and Concept Design Study

12.3.1 Project Overview

JEN undertook a feasibility study into deploying a Grid Battery Energy Storage System (GESS) as a peak shaving technology and assessed its capability in economically addressing capacity constraints in a selected part of JEN. The project continued into the 2016 regulatory year and was completed in January 2016.

JEN stated that as the study was limited to desktop modelling, analysis and simulation, there have been no quantifiable benefits in terms of reduction in peak demand. However, the learning from the study will be directly applicable when Jemena begins a trial deployment of a GESS in a constrained part of JEN's network. Jemena claimed DMIA expenditure in 2016 of $22,300 for this project.

12.3.2 Assessment against DMIA criteria

Criteria #1 The project is aimed at developing JEN's capabilities to reduce peak demand in constrained parts of the network, rather than increasing supply capacity through network augmentation.

Criteria #2 The project is a peak demand management initiative which aims to address specific network constraints by reducing demand on the network at the location and time of the constraint.

Criteria #3 The project deliverables are to develop JEN's capability in deploying GESS as an effective, economic and efficient peak demand management solution. The primary objectives of the GESS feasibility and design study was to develop load data analysis and battery control simulation tools, which enable JEN to do high level design and assessment of GESSs as part of planning processes.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

12.4 Commercial and industrial solar PV and battery storage / residential demand response

12.4.1 Project Overview

This project has two components: (a) commercial and industrial solar PV, and battery storage, and (b) residential demand response. The nature of the project is to develop and demonstrate that a distributed fleet of solar PV and battery storage systems with coordinated control can provide benefits to feeder, upstream zone substation and sub-transmission constraints, while allowing customers to derive other benefits from the same assets. Jemena claimed DMIA expenditure in 2016 of $ 44,469 for this project.

12.4.2 Assessment against DMIA criteria

Criteria #1 The project is aimed at developing Jemena's capabilities to reduce peak demand in constrained parts of the network, rather than increasing supply capacity through network augmentation.

Criteria #2 The project is a peak demand management initiative which aims to address specific network constraints by reducing demand on the network at the location and time of the constraint.

Criteria #3 The project deliverables are to develop Jemena's capability in Residential Demand Response as an effective, economic and efficient peak demand management solution.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

13 Powercor

No projects reported in 2016 and no allowance has been claimed.

14 SA Power Networks

We approve DMIA expenditure of $1,955,690 for three projects in 2015–16 because they meet the DMIA criteria. The following section sets out our assessment of the individual projects. For more detailed information about these projects, please refer to SA Power Networks' 2015–16 DMIA reports which are published separately on AER's website.

14.1 Grid Side Storage

14.1.1 Project overview

This is a practical research study into the performance of energy storage systems across the likely applications within the distribution network. With the increasing amount of Energy Storage System technologies and their applications this project will produce a mobile testing environment to further develop these technologies and to understand their use in Australian conditions. The project will create a knowledge base for industry and system developers whilst also providing for advanced training facilities on an operational system. SA Power Networks claimed DMIA expenditure of $218,104 in 2015–16 for this project.

14.1.2 Assessment against DMIA criteria

Criteria #1 This project will provide insight into the suitability and performance of different storage technologies when utilised in the most likely scenarios for distribution network management and operation.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project provides study into the performance of energy storage systems.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because the funding via the DMIA is complimentary to ARENA funding for the project and there is no doubling up.

Criteria #6 Opex

14.2 Future Network Modelling

14.2.1 Project overview

To further understand energy storage impacts on the distribution network so as to allow network operations and design to accommodate these systems SA Power Networks has undertaken a comprehensive modelling project. SA Power Networks claimed DMIA expenditure of $263,289 in 2015–16 for this project.

14.2.2 Assessment against DMIA criteria

Criteria #1 This modelling will provide insights into the rate of take up of distributed energy resources based on the costs of those resources and the economic returns to the customer. It will also enable insights into the likely impacts on network load profiles

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project provides study into the impacts of energy storage systems, which will assist SA Power Networks in forecasting demand management.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

14.3 Residential Energy Storage

14.3.1 Project overview

This project will deploy 100 energy storage systems within a selected trial area to study the performance of energy storage systems across the likely applications for this technology as part of efficient distribution network operation and management. We have also looked at this in relation to ring-fencing obligations and have noted this is a trial and so unlikely to be a concern. SA Power Networks claimed DMIA expenditure of $1,474,298 in 2015–16 for this project.

14.3.2 Assessment against DMIA criteria

Criteria #1 The trial tests the applicability of residential energy storage systems to defer the building of new, or augmentation of existing, network infrastructure. Another objective is to understand the broader benefits and attractiveness of residential energy storage to customers with a view to informing the likely timing of larger scale take-up and the levels of subsidy required to facilitate take-up for network purposes.

Criteria #2 This is a broad-based demand management program.

Criteria #3 This project tests the applicability of residential energy storage systems to defer the building of new, or augmentation of existing, network infrastructure.

Criteria #4 Non-tariff based

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

15 TasNetworks

TasNetworks is claiming for 2015-16 DMIA expenditure for three demand management projects totalling $237,000. This expenditure relates to the 4th year of the previous regulatory period. We approve this expenditure as it meets the DMIA criteria. The following section sets out our assessment of the individual projects. For more detailed information about these projects, please refer to TasNetworks' 2015-16 DMIA report which is published separately on AER's website.

15.1 Tariff Trial

15.1.1 Project overview

The scope of this project is to gather data on customer usage patterns to improve models and planning, and to determine customer's response to new tariff designs and the effect it has on the load they place on the networks.

TasNetworks claimed DMIA expenditure in 2015–16 of $129,000 for this project.

15.1.2 Assessment against DMIA criteria

Criteria #1 The purpose of this project is to both shift and reduce the demand for standard control services through a non-network alternative.

Criteria #2 This is a broad-based demand management project.

Criteria #3 This project satisfies this condition as it is designed to build demand management capability in TasNetworks and provide a new potentially efficient demand management mechanism.

Criteria #4 Tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

15.2 Battery storage and embedded generation on Bruny Island

15.2.1 Project overview

The purpose of this project was to research and model an integrated solution of load management, energy storage, static voltage control and backup diesel generation, to address a specific area of the distribution network (Bruny Island) that has limited capability to meet required service levels. The integrated solution provides capability to

allow modelling the connection of renewable energy resources, such as wind and solar, to determine impacts on system performance.

TasNetworks claimed DMIA expenditure in 2015–16 of $69,000 for this project.

15.2.2 Assessment against DMIA criteria

Criteria #1 This project meets the criteria because it seeks to better integrate non-network solutions to help address capacity constraints in the distribution network (rather than relying on network augmentation).

Criteria #2 This is a peak demand management project.

Criteria #3 This project meets the criteria as it explores the use of newer technologies such as battery storage and embedded generation in order to manage network demand.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

15.3 Demonstration Energy Storage System

15.3.1 Project overview

This project aims to trial the network interface and control of a distributed energy storage system. It involves installing a residential scale energy storage device on a TasNetworks facility (with a solar system) and trialling dispatch through a device that TasNetworks owns.

TasNetworks claimed DMIA expenditure in 2015–16 of $39,000 for this project.

15.3.2 Assessment against DMIA criteria

Criteria #1 The purpose of this project is to explore both shifting and reducing the demand for standard control services through a non-network alternative.

Criteria #2 This is a broad-based demand management project.

Criteria #3 This project is designed to build demand management capability in TasNetworks and provide a new potentially efficient demand management mechanism.

Criteria #4 Non-tariff based

Criteria #5 This criterion is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor

through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

16 United Energy

United Energy is claiming 2016 DMIA expenditure for two demand management projects totalling $505,453. We approve this expenditure as it meets the DMIA criteria. The following section sets out our assessment of the individual projects. For more detailed information about these projects, including any identifiable benefits derived from the projects, please refer to United Energy's 2016 DMIA report which is published separately on AER's website.

16.1 Virtual Power Plant Stage1 (VPP) Project

16.1.1 Project Overview

The aim of the project is to validate or otherwise, the use of a VPP to manage embedded generation and storage in a residential setting for the provision of efficient and prudent non-network augmentation.

The VPP integrates the operation of both supply and demand-side assets to meet customer demand for energy services in both the short and long-term. To match short-interval load fluctuations, the VPP is intended to make extensive and sophisticated use of information technology, advanced metering, automated control capabilities, and electricity storage.

United Energy claimed DMIA expenditure in 2016 of $72,632 for this project.

16.1.2 Assessment against DMIA criteria

Criteria #1 The VPP project attempts to combine the capabilities of solar PV generation and battery storage to flatten out the demand profile by charging the battery during the middle of the day when solar PV generation is at its maximum and discharging the battery during the early evening when residential demand is at its maximum. Aggregating VPP units will provide a system that can be dispatched to manage network capacity constraints.

Criteria #2 The VPP aims to address specific network constraints by reducing demand on the network at the location and time of the constraint. If the VPP concept is proven, it is intended to locate such units in areas where there are identified network constraints. In the first instance, this is likely to be in areas where there are significant distribution transformer constraints by clustering the VPP units in localised areas. Ultimately the goal is to alleviate constraints higher up in the network such as at the distribution feeder or zone substation level.

Criteria #3 The VPP offers a new solution for a constrained network area, particularly where load growth is low, uncertain or is expected to plateau in future. The ability to provide incremental amounts of capacity through combining renewable generation and storage to meet the demand as it materialises could be economic against a more traditional network solution that provides significant step increases in capacity at higher cost. The VPP is intended to test this concept.

Criteria #4 Non-tariff based.

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex

16.2 Summer Saver Program

16.2.1 Project Overview

The Summer Saver Trial is an investigation of how effective and efficient customer demand response is as a non-network alternative at addressing demand at peak times. The trial investigates demand management options. The outcomes of this trial will enable UE to develop a demand management model that describes the best combination of mechanisms that will result in the biggest peak demand reduction at specific locations based on customer demographics and load profiles.

UE launched the trial in February 2014 targeting 6,500 customers on four Bulleen zone substation feeders. Customers were offered $25 if they reduced their load during the UE nominated three hour event period. UE anticipated calling on average four events per summer with the customer having the opportunity to earn $100 for the summer if they participated in all events.

UE expanded the trial for summer 2014-15 to target 4,000 more customers in areas of the network that were likely to experience an interruption from electrical asset overload. The trial also introduced new demand management options to existing trial members including direct load control of pool pumps, and supply capacity limiting.

The trial was expanded again for summer 2015-16 to target a total of 13,000 customers in areas of the network that are likely to experience an interruption from electrical asset overload. On top of the pool pump load control and supply capacity limiting options, the new option of load control of air-conditioners was added to the service offerings. A customer smart phone application was also introduced.

United Energy claimed DMIA expenditure in 2016 of $432,822 for this project.

16.2.2 Assessment against DMIA criteria

Criteria #1 The Summer Saver Trial seeks to incentivise customers to reduce their load during peak times. Voluntary trial customers were rewarded $5 per hour for reducing their load during the UE nominated three hour event period. Customers who reduced for all 3 hours were rewarded $25. Customers on the pool pump load control program were incentivised $40 per event for load reduction and Supply Capacity Limiting customers were incentivised $50 per event for load reduction. Customers on the air conditioner load control trial were incentivised $50 per event for load reduction and $100 as a sign up bonus.

Criteria #2 The Summer Saver Trial sought to address specific network constraints and is therefore targeted at customers directly impacted by those constraints. The trial targeted approximately 13,000 customers in areas of the network which are likely to suffer an interruption during summer or had suffered an interruption in previous summers due to electrical plant overload. Throughout the trial, UE sought to understand if sufficient numbers of customers participate in the trial with the right level of behaviour to reduce sufficient load to prevent an interruption.

Criteria #3 Since UE's network is predominantly metropolitan demand management such as demonstrated by this trial is a crucial option to be explored.

Criteria #4 Non-tariff based.

Criteria #5 This criteria is met because expenditure for this project is not being recovered through any other jurisdictional, state or Australian Government scheme, nor through any other part of the distribution determination for the current regulatory control period.

Criteria #6 Opex