6. DEMAND MANAGEMENT INNOVATION ALLOWANCE

In this section, JEN responds to section 6 of Schedule 1 to the RIN for the 2016 Relevant Regulatory Year, which relates to the Demand Management Innovation Allowance (**DMIA**).

6.1 IDENTIFICATION OF DEMAND MANAGEMENT PROJECTS OR PROGRAMS

Paragraph 6.1 of Schedule 1 to the RIN requires JEN to identify each demand management project or program for which JEN seeks approval.

JEN seeks approval for four projects for the 2016 Regulatory Year, which are outlined below.

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

   In 2015 JEN undertook a desktop study into controlling the demand of commercial and industrial customers on one of our 22kV feeders (BD-13) as a Demand Response initiative. 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.

2. **Demand Management Constraint Analysis Tool**

   Jemena 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. Development of the tool, which comes with advanced modelling features, continued into the 2016 Regulatory Year and was completed in January 2016.

3. **Grid Battery Energy Storage System Feasibility and Concept Design Study**

   In Regulatory Year 2015 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 area of JEN's network. The project which included model development and desktop analysis continued into the 2016 Regulatory Year and was completed in January 2016.

4. **Commercial and Industrial Solar PV and Battery Storage / Residential Demand Response**

   In the 2016 Regulatory Year Jemena has worked on the development of project scopes for the deployment of distributed solar photovoltaic (**PV**) and battery storage solutions at commercial and industrial customer premises, and residential demand response. The project scopes are expected to be finalised followed by a business case development in the 2017 Regulatory Year.

6.2 DETAILED INFORMATION – DEMAND RESPONSE TRIAL PROJECT ON 22KV FEEDER BD-13 (PHASE 1)

Paragraph 6.2 of Schedule 1 to the RIN requires JEN to provide detailed information for each demand management project or program identified in response to paragraph 6.1 of Schedule 1 to the RIN.

6.2.1 COMPLIANCE

Paragraph 6.2(a)(i) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative complies with the DMIA criteria set out in section 3.1.3 of the Demand Management Incentive Scheme (**DMIS**).

Jemena undertook a desktop study of controlling the demand of large commercial/industrial customers on one of our 22kV feeders, BD-13, as a demand response (**DR**) initiative in 2015 to develop our understanding of the DR technology, benefits, costs, pricing/commercial arrangements and operational structures of target customers. The project continued into the 2016 Regulatory Year and included engaging a demand response technology provider in seeking and signing up enough commercial/industrial customers for an actual demand response trial in 2016 as Phase 2 of the project. There was, however, not enough customer interest so the project did not proceed to field trial.

JEN considers that works to engage and sign up commercial/industrial customers for an actual demand response trial in the 2016 Regulatory Year complies with DMIA criteria, set out in section 3.1.3 of the DMIS, in the following ways:

- Section 3.1.3-1 – The project is aimed at developing Jemena's capabilities to reduce peak demand through customer controlled demand response projects, rather than increasing supply capacity through network augmentation.
- Section 3.1.3-2 – 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.
- Section 3.1.3-3 – The project deliverables are to prepare Jemena for various elements of customer controlled demand response programs as an effective and efficient demand management solution.
- Section 3.1.3-4 – The project is a non-tariff based project and the costs are not recovered under any other incentive scheme.
- Section 3.1.3-5 – The project cost has not been recovered under other schemes. See section 6.2.8 of JEN's response for more details.
- Section 3.1.3-6 – The nature of expenditure is operating expenditure.

6.2.2 NATURE AND SCOPE

Paragraph 6.2(a)(ii) of Schedule 1 to the RIN requires JEN to explain the nature and scope of JEN's initiative.

The scope of work for the Demand Response Trial on 22kV feeder BD-13 (Phase 1) in Regulatory Year 2016 includes the following key deliverables:

- Recruiting enough customers for a demand response field trial in 2016.

The project failed to recruit enough customer loads to manage the risk of unserved energy on feeder BD-13 and therefore did not proceed to field implementation stage. JEN, however, has derived significant learnings from the project particularly in the customer engagement and acquisition process. These learnings will be applied in future customer demand response initiatives.

6.2.3 AIMS AND EXPECTATIONS

Paragraph 6.2(a)(iii) of Schedule 1 to the RIN requires JEN to explain the aims and expectations of JEN's initiative.

The aims and expectations of the Demand Response Field Trial - Phase 1 project are to:

- Understand the requirements of a potential DR initiative as a viable demand management solution;
- Investigate DR with the objective of deferring network augmentation works or mitigating network outage risk;
- Develop Jemena's capabilities in the area so as to facilitate the evaluation and implementation of DR solutions, and
- Recruit customers for Phase 2 of the project in 2016 and 2017, aimed at a field trial of the technology with large commercial/industrial customers on feeder BD-13.

6.2.4 SELECTION PROCESS

Paragraph 6.2(a)(iv) of Schedule 1 to the RIN requires JEN to explain the process by which JEN's project was selected, including its business case and consideration of any alternatives.

JEN can leverage DR to transfer network risk to customers both before and during outages reducing the overall costs of network operation. Likewise, utilizing DR for asset deferral can help Jemena achieve the best possible economic outcome for its customers, while maintaining the same level of network reliability. Regardless of the asset used to undertake DR (customer side generation, curtailment or storage) effective risk transfer can be achieved through DR. The cost effectiveness of risk transfer is driven by the ability of the available customer base, DR technologies, and business processes with a fast enough reaction time to mitigate the impact of network outages. While desktop studies of DR opportunities can be carried out, additional learnings can be derived by undertaking activities involving customer engagement and recruitment.

In 2015 Jemena undertook a desktop study of controlling the demand of large commercial/industrial customers on one of our capacity constraint 22kV feeders, BD-13. Following from the desktop study, Jemena proceeded to engage and recruit customers for a DR field trial. By undertaking this project, Jemena intended to field trial DR on feeder BD-13 for 2016 and 2017 and refine its approach and strategy on demand management.

6.2.5 IMPLEMENTATION

Paragraph 6.2(a)(v) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative was implemented.

The works associated with the Demand Response Trial Project on 22kV feeder BD-13 (Phase 1) that were completed in 2016 have been delivered as follows:

- Engaging with customers and seeking their willingness and acceptance in participating in a potential DR initiative.

The project failed to recruit enough customer loads to manage the risk of unserved energy on feeder BD-13 and therefore did not proceed to field implementation stage.

6.2.6 IMPLEMENTATION COSTS

Paragraph 6.2(a)(vi) of Schedule 1 to the RIN requires JEN to explain the implementation costs of JEN's project.

The actual expenditure for the Demand Response Trial Project on 22kV feeder BD-13 (Phase 1) incurred in the 2016 Regulatory Year was $14,021, as set out in Template 7.11 (DMIS – DMIA) (Attachment 1-1 of JEN's response).

6.2.7 BENEFITS

Paragraph 6.2(a)(vii) of Schedule 1 to the RIN requires JEN to explain any identifiable benefits that have arisen from JEN's project, including any off peak or peak demand reduction.

Since the Demand Response Trial on 22kV feeder BD-13 (Phase 1) failed to recruit enough customer loads for actual demand response trial, there have been no quantifiable benefits in terms of reduction in peak demand. JEN has derived significant learnings from the project particularly in the customer engagement and acquisition process. These learnings have been documented and will be applied in future customer demand response initiatives.

6.2.8 ASSOCIATED COSTS

Paragraph 6.2(b) of Schedule 1 to the RIN requires JEN to state whether the costs associated with JEN's initiative have been recovered under other schemes.

The associated costs for the development of the Demand Response Trial Project on 22kV feeder BD-13 (Phase 1) have not been:

- recovered under any other jurisdictional incentive scheme,
- recovered under any other Commonwealth or State Government scheme, and
- included in the forecast capital or operating expenditure approved in the 2016-20 Distribution Determination or recovered under any other incentive scheme in that determination.

6.2.9 TOTAL AMOUNT OF DMIA SPENT AND HOW THIS AMOUNT WAS CALCULATED

Paragraph 6.2(c) of Schedule 1 to the RIN requires JEN to state the total amount of the DMIA spent in the Relevant Regulatory Year and how it was calculated.

The actual spent on Phase 1 of the Demand Response Trial Project on 22kV feeder BD-13 in Regulatory Year 2016 was $14,021.

The project spent (materials, internal labour and external labour) is collected and tracked in JEN's accounting system.

6.3 DETAILED INFORMATION – DEMAND MANAGEMENT CONSTRAINT ANALYSIS TOOL

Paragraph 6.2 of Schedule 1 to the RIN requires JEN to provide detailed information for each demand management project or program identified in response to paragraph 6.1 of Schedule 1 to the RIN.

6.3.1 COMPLIANCE

Paragraph 6.2(a)(i) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative complies with the DMIA criteria set out in section 3.1.3 of the DMIS.

JEN initiated the development of a Demand Management Constraint Analysis Tool (**CAT**) in association with a demand response technology provider in 2015. The software tool allows network planning engineers compare costs and benefits of multiple network and non-network options and undertake a consistent cost benefit analysis of options. The project continued into the 2016 Regulatory Year and was completed in January 2016.

JEN considers that the development of a Demand Management CAT in the 2016 Regulatory Year complies with DMIA criteria, set out in section 3.1.3 of the DMIS, in the following ways:

- Section 3.1.3-1 – The tool allows network planning engineers apply a consistent approach in analysing and comparing multiple network and non-network options.
- Section 3.1.3-2 – The project is a broad based Demand Management cost-benefit analysis initiative, and is not aimed at a specific location on the network.
- Section 3.1.3-3 – The project deliverable is a software tool which can be used to develop and enhance Jemena's capability in comparing and analysing multiple network and non-network options. In return to the upfront capital contribution and co-development effort, Jemena can subscribe to the use of the software tool at a discounted price for two years after the completion of the development. JEN is not aware of any currently commercially available software package that allows the user to apply probabilistic planning methodology to assess the economic benefits of multiple non-network and network augmentation options.
- Section 3.1.3-4 – The project is a non-tariff based project and the costs are not recovered under any other incentive scheme.
- Section 3.1.3-5 – The project cost has not been recovered under other schemes. See section 6.3.8 of JEN's response for more details.
- Section 3.1.3-6 – The nature of expenditure is operating expenditure.

6.3.2 NATURE AND SCOPE

Paragraph 6.2(a)(ii) of Schedule 1 to the RIN requires JEN to explain the nature and scope of JEN's initiative.

The nature of the project is to contribute to the development of a software tool that allows network planning engineers apply a consistent approach in analysing and comparing multiple network and non-network options.

The scope of works for the project includes developing a software tool with the following capabilities:

- Advanced modelling of network options, including capability to assess benefits under various network operating scenarios, including network transfer and switching scenarios.
- Advanced modelling of non-network options, including capability to assess benefits under various Demand Management asset types, various Demand Management portfolios and various network operating scenarios, including network transfer and switching scenarios.
- View year-on-year tabulated cost benefit for the duration of the forecasts.
- View the optimal deferral length in a chart format.
- Export the results of analysis to other documents, e.g., Business Cases.

JEN engaged a Demand Response technology provider as a consultant to develop the tool and provide the deliverables in the project scope.

6.3.3 AIMS AND EXPECTATIONS

Paragraph 6.2(a)(iii) of Schedule 1 to the RIN requires JEN to explain the aims and expectations of JEN's initiative.

The aims and expectations of the project are to:

- Develop a software tool that allows costs and benefits of multiple network and non-network options be considered.
- Develop a framework and methodology for a consistent and objective cost benefit analysis of multiple network and non-network options.

6.3.4 SELECTION PROCESS

Paragraph 6.2(a)(iv) of Schedule 1 to the RIN requires JEN to explain the process by which JEN's project was selected, including its business case and consideration of any alternatives.

To support the demand management objectives of the business and allow demand management options to be considered on the same basis as traditional network options, JEN needs to develop and adopt a more accurate cost benefit analysis tool for both network and non-network options with advanced network and demand management scenario modelling capability.

JEN therefore decided to undertake this project in order to meet this identified need.

6.3.5 IMPLEMENTATION

Paragraph 6.2(a)(v) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative was implemented.

JEN surveyed the market and did not find a commercially available software package that allows the user to apply probabilistic planning methodology to assess the economic benefits of multiple non-network and network augmentation options. JEN decided to team up with a demand response technology provider to develop the tool. This collaborative approach allows JEN's knowledge on grid side issues and network considerations be combined with the consultant's expertise of Demand Response technology.

The works associated with the Demand Management CAT were carried out over Regulatory Years 2015 and 2016 and have been delivered as follows:

- Develop a Demand Management CAT trial version with the following capabilities:
  - Input of constraint load shapes;
  - Input of load growth forecasts;
  - Calculation of benefits (Energy at Risk and Expected Unserved Energy);
  - Model network augmentation options (including Capacity benefits calculator);
  - Model DSM solution options (including Capacity benefits calculator);
  - Cost/Benefit analysis of options and comparison.
- Develop a Demand Management CAT production version with advanced modelling capabilities:
  - Advanced modelling of network augmentation options, including network transfer and switching benefits calculation;
  - Advanced modelling of Demand Management solution options, including advanced Demand Management asset types, advanced Demand Management portfolios and advanced network transfer and switching benefits calculation;
  - Auto-optimisation of Demand Management solution scale and deferral period;
  - Effectiveness factors for sub-transmission and transmission constraints;

- Parent-child network modelling allowing the benefits of a Demand Management solution to be assessed in the broader contexts of the feeder, zone substation and sub-transmission network.

The project was completed in January 2016.

6.3.6 IMPLEMENTATION COSTS

Paragraph 6.2(a)(vi) of Schedule 1 to the RIN requires JEN to explain the implementation costs of JEN's project.

The actual expenditure for the Demand Management CAT project incurred in the 2016 Regulatory Year was $29,814, as set out in Template 7.11 (DMIS – DMIA) (Attachment 1-1 of JEN's response). This represented the final payment (50%) of the contract engagement over two Regulatory Years 2015 and 2016.

6.3.7 BENEFITS

Paragraph 6.2(a)(vii) of Schedule 1 to the RIN requires JEN to explain any identifiable benefits that have arisen from JEN's project, including any off peak or peak demand reduction.

There have been no quantifiable benefits associated with this project in Regulatory Year 2016.

6.3.8 ASSOCIATED COSTS

Paragraph 6.2(b) of Schedule 1 to the RIN requires JEN to state whether the costs associated with JEN's initiative have been recovered under other schemes.

The associated costs for the development of Demand Management CAT have not been:

- recovered under any other jurisdictional incentive scheme,
- recovered under any other Commonwealth or State Government scheme, and
- included in the forecast capital or operating expenditure approved in the 2016-20 Distribution Determination or recovered under any other incentive scheme in that determination.

6.3.9 TOTAL AMOUNT OF DMIA SPENT AND HOW THIS AMOUNT WAS CALCULATED

Paragraph 6.2(c) of Schedule 1 to the RIN requires JEN to explain the total amount of the DMIA spent in the Relevant Regulatory Year and how it was calculated.

The actual amount spent on Demand Management CAT in Regulatory Year 2016 was $29,814.

The project spent (materials, internal labour and external labour) is collected and tracked in JEN's accounting system.

6.4 DETAILED INFORMATION – GRID BATTERY ENERGY STORAGE SYSTEM – FEASIBILITY AND CONCEPT DESIGN STUDY

Paragraph 6.2 of Schedule 1 to the RIN requires JEN to provide detailed information for each demand management project or program identified in response to paragraph 6.1 of Schedule 1 to the RIN.

6.4.1 COMPLIANCE

Paragraph 6.2(a)(i) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative complies with the DMIA criteria set out in section 3.1.3 of the DMIS.

JEN initiated a Grid Energy Storage System (**GESS**) feasibility and design study in 2015 to develop our understanding of utility scale energy storage technology in mitigating peak demand network constraints and its impact on the distribution network and the quality of electricity supply. The project continued into the 2016 Regulatory Year and was completed in January 2016.

JEN considers that the feasibility study into the deployment of GESS as a peak shaving technology in the 2016 Regulatory Year complies with DMIA criteria, set out in section 3.1.3 of the DMIS, in the following ways:

- Section 3.1.3-1 – 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.
- Section 3.1.3-2 – 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.
- Section 3.1.3-3 – The project deliverables are to develop Jemena'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 Jemena to do high level design and assessment of GESSs as part of BAU planning processes
- Section 3.1.3-4 – The project is a non-tariff based project and the costs are not recovered under any other incentive scheme.
- Section 3.1.3-5 – The project cost has not been recovered under other schemes. See section 6.4.8 of JEN's response for more details.
- Section 3.1.3-6 – The nature of expenditure is operating expenditure.

6.4.2 NATURE AND SCOPE

Paragraph 6.2(a)(ii) of Schedule 1 to the RIN requires JEN to explain the nature and scope of JEN's initiative.

The nature of the project is to develop our understanding of utility scale energy storage technology in mitigating peak demand network constraints, its impact on the distribution network and the quality of electricity supply, with particular focus on the application to the suburban distribution network of Jemena.

The scope of works for the GESS Feasibility and Concept Design Study includes the following key deliverables:

- Develop a concept design for a multi-feeder GESS for an area of the network constrained by sub-transmission, zone substation and distribution feeders.
- Determine an optimum size of a multi-feeder GESS. This is achieved by analysing historical load and daily load curves and developing a number of load and daily load curve forecast as the basis for determining an optimum size for batteries.
- Design and simulate a distributed energy management system for the multi-feeder GESS.
- Analyse and assess the impact of the GESS on the network.
- Estimate cost of implementing the multi-feeder GESS.
- Assess the economic benefits of the GESS, including potential deferment or avoidance of large capital expenditure.

- Develop a framework for the planning assessment of GESS as a peak demand management tool.

JEN engaged a consultant to provide the deliverables in the project scope.

6.4.3 AIMS AND EXPECTATIONS

Paragraph 6.2(a)(iii) of Schedule 1 to the RIN requires JEN to explain the aims and expectations of JEN's initiative.

The aims and expectations of the GESS Feasibility and Concept Design Study are to:

- Understand the benefits, costs and operating modes of the GESS as a viable peak demand management solution;
- Investigate GESS technology for possible future implementation within the JEN's network with the objective of deferring network augmentation works or mitigating network outage risk. While a number of grid storage pilot or demonstration projects have been initiated by electricity distribution companies, the majority of these are targeted at "edge-of-grid" applications where battery economics are comparable to network augmentation costs. This is not the case for JEN's predominantly suburban electricity network;
- Develop JEN's capabilities in the area so as to facilitate the evaluation and implementation of GESS solutions from various technology providers.
- Lay the foundation for a GESS field trial project.

6.4.4 SELECTION PROCESS

Paragraph 6.2(a)(iv) of Schedule 1 to the RIN requires JEN to explain the process by which JEN's project was selected, including its business case and consideration of any alternatives.

Advances in GESS technologies represent an opportunity for Jemena to manage network risks associated with capacity constraints in ways that have not previously been possible. By undertaking this project, Jemena intends to develop and refine its approach and strategy on cost effective peak demand management solutions.

GESS has the potential for economic management of network risks associated with capacity constraint. Jemena can leverage GESS to manage network risk both before and during outages and potentially reduce the overall costs of network operation. Utilising GESS for asset deferral can help Jemena achieve the best possible economic outcome for its customers, while maintaining the same level of network reliability.

JEN therefore decided to undertake this project to gain a better understanding of the benefits, costs and operating modes of GESS as a viable peak demand management solution in order to realise these benefits.

6.4.5 IMPLEMENTATION

Paragraph 6.2(a)(v) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative was implemented.

JEN has taken a collaborative approach with its consultant on this project, where JEN's knowledge of grid side issues and network considerations is combined with the consultant's expertise in energy storage design and solutions.

The works associated with the GESS Feasibility and Concept Design Study were carried out over two Regulatory Years 2015 and 2016 and have been delivered as follows:

- Selection of a part of JEN network constrained by sub-transmission, zone substation and distribution feeder capacity and development of network models for energy flow analysis.

- Development of concept designs for multi-feeder GESS.
- Design, development and simulation of two distributed control systems.
  - A Parallel Distributed Control System for GESS (battery and inverter)
  - A Parallel Distributed Control System for the upstream network.
- Development of models including key parameters and GESS operating modes relevant for successful implementation of a trial project.
- Complete an economic assessment of the GESS option and compare with traditional network solutions
- Preparation of a report documenting the project findings

The project was completed in January 2016.

6.4.6 IMPLEMENTATION COSTS

Paragraph 6.2(a)(vi) of Schedule 1 to the RIN requires JEN to explain the implementation costs of JEN's project.

The actual expenditure for the GESS Feasibility and Concept Design Study incurred in the 2016 Regulatory Year was $22,300, as set out in Template 7.11 (DMIS – DMIA) (Attachment 1-1 of JEN's response). This represented the final payment (45%) of the contract engagement over two Regulatory Years 2015 and 2016.

6.4.7 BENEFITS

Paragraph 6.2(a)(vii) of Schedule 1 to the RIN requires JEN to explain any identifiable benefits that have arisen from JEN's project, including any off peak or peak demand reduction.

As the GESS Feasibility and Concept Design Study was limited to desktop modelling, analysis and simulation, there have been no quantifiable benefits in terms of reduction in peak demand. However, the learnings from the study will be directly applicable when Jemena begins a trial deployment of a GESS in a constrained part of JEN's network.

6.4.8 ASSOCIATED COSTS

Paragraph 6.2(b) of Schedule 1 to the RIN requires JEN to state whether the costs associated with JEN's initiative have been recovered under other schemes.

The associated costs for the development of the GESS Feasibility and Concept Design Study have not been:

- recovered under any other jurisdictional incentive scheme,
- recovered under any other Commonwealth or State Government scheme, and
- included in the forecast capital or operating expenditure approved in the 2016-20 Distribution Determination or recovered under any other incentive scheme in that determination.

6.4.9 TOTAL AMOUNT OF DMIA SPENT AND HOW THIS AMOUNT WAS CALCULATED

Paragraph 6.2(c) of Schedule 1 to the RIN requires JEN to explain the total amount of the DMIA spent in the Relevant Regulatory Year and how it was calculated.

The actual spent on GESS Feasibility and Concept Design Study in Regulatory Year 2016 was $22,300.

The project spend (materials, internal labour and external labour) is collected and tracked in JEN's accounting system.

6.5 DETAILED INFORMATION – COMMERCIAL AND INDUSTRIAL SOLAR PV AND BATTERY STORAGE / RESIDENTIAL DEMAND RESPONSE

This project has two components: (a) commercial & industrial solar PV and battery storage, and (b) residential demand response.

6.5.1 DETAILED INFORMATION – COMMERCIAL & INDUSTRIAL SOLAR PV AND BATTERY STORAGE

Paragraph 6.2 of Schedule 1 to the RIN requires JEN to provide detailed information for each demand management project or program identified in response to paragraph 6.1 of Schedule 1 to the RIN.

6.5.1.1 Compliance

Paragraph 6.2(a)(i) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative complies with the DMIA criteria set out in section 3.1.3 of the DMIS.

The Grid Battery Energy Storage System Feasibility and Concept Design Study (a previous demand management project) concluded that other battery storage benefits (e.g. energy arbitrage), in addition to capital expenditure deferral, would need to be included to economically justify the battery solution over a network augmentation solution. In the 2016 Regulatory Year Jemena has worked on the development of a project scope for the deployment of distributed solar photovoltaic (**PV**) and battery storage solutions at commercial and industrial customer premises. The scope is expected to be finalised followed by development of a business case in the 2017 Regulatory Year.

JEN considers that the development of a project scope for the deployment of distributed solar PV and battery storage solutions at commercial and industrial customer premises in the 2016 Regulatory Year complies with DMIA criteria, set out in section 3.1.3 of the DMIS, in the following ways:

- Section 3.1.3-1 – 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.
- Section 3.1.3-2 – 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.
- Section 3.1.3-3 – The project deliverables are to develop Jemena's capability in facilitating distributed solar PV and battery storage deployment at commercial and industrial customer premises as an effective, economic and efficient peak demand management solution.
- Section 3.1.3-4 – The project is a non-tariff based project and the costs are not recovered under any other incentive scheme.
- Section 3.1.3-5 – The project cost has not been recovered under other schemes. See section 6.5.1.7 of JEN's response for more details.
- Section 3.1.3-6 – The nature of expenditure is operating expenditure.

6.5.1.2 Nature and scope

Paragraph 6.2(a)(ii) of Schedule 1 to the RIN requires JEN to explain the nature and scope of JEN's initiative.

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.

The scope of works for the Commercial and Industrial Solar PV and Battery Storage project includes the following key deliverables:

- Develop a project scope for the deployment of distributed solar PV and battery storage solutions at commercial and industrial customer premises for an area of the network constrained by sub-transmission, zone substation and distribution feeders. The scope is expected to be finalised followed by a business case development in the 2017 Regulatory Year.

JEN engaged a consultant to provide the deliverables in the project scope.

6.5.1.3 Aims and expectations

Paragraph 6.2(a)(iii) of Schedule 1 to the RIN requires JEN to explain the aims and expectations of JEN's initiative.

The aims and expectations of the GESS Feasibility and Concept Design Study are to:

- Understand the benefits, costs and operating modes of the distributed solar PV and battery storage systems as a viable peak demand management solution;
- Investigate the distributed solar PV and battery storage technology for possible future implementation within the Jemena electricity network with the objective of deferring network augmentation works or mitigating network outage risk.
- Develop Jemena's capabilities in the area so as to facilitate the deployment of distributed solar PV and battery storage solutions for network peak demand management.
- Develop the business process to facilitate customer acquisition by third party.

6.5.1.4 Selection process

Paragraph 6.2(a)(iv) of Schedule 1 to the RIN requires JEN to explain the process by which JEN's project was selected, including its business case and consideration of any alternatives.

Advances in coordinated control of distributed solar PV and battery storage technologies represent an opportunity for Jemena to manage network risks associated with capacity constraints in network. By undertaking this project, Jemena intends to develop and refine its approach and strategy on cost effective peak demand management solutions.

The coordinated control of distributed solar PV and battery storage has the potential for economic management of network risks associated with capacity constraint. Jemena can leverage the distributed solar PV and battery storage technology to manage network risk and potentially reduce the overall costs of network operation.

JEN therefore decided to undertake this project to gain a better understanding of the benefits, costs and operating modes of distributed solar PV as a viable peak demand management solution in order to realise these benefits.

6.5.1.5 Implementation

Paragraph 6.2(a)(v) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative was implemented.

Jemena has taken a collaborative approach with the Consultant on this project, where Jemena's knowledge on grid side issues and network considerations is combined with the Consultant's expertise on the development of the project scope for distributed solar PV and battery storage solution.

The works associated with the Commercial and Industrial Solar PV and Battery Storage that were carried in Regulatory Year 2016 have been delivered as follows:

- Selection of target commercial and industrial customers on parts of JEN network forecast to be constrained.
- Development of communication plan to engage target commercial and industrial customers and seek their interest in participating in a trial project.
- Development of a project scope to deploy distributed solar PV and battery storage technology as an alternative to increasing network capacity through network augmentation. The project scope is expected to be finalised followed by a business case development in the 2017 Regulatory Year.

6.5.1.6 Benefits

Paragraph 6.2(a)(vii) of Schedule 1 to the RIN requires JEN to explain any identifiable benefits that have arisen from JEN's project, including any off peak or peak demand reduction.

As the Commercial and Industrial Solar PV and Battery Storage was limited to target customer identification and part development of the project scope, there have been no quantifiable benefits in terms of reduction in peak demand in the 2016 Regulatory Year.

6.5.1.7 Associated costs

Paragraph 6.2(b) of Schedule 1 to the RIN requires JEN to state whether the costs associated with JEN's initiative have been recovered under other schemes.

The associated costs for Commercial and Industrial Solar PV and Battery Storage in the 2016 Regulatory Year have not been:

- recovered under any other jurisdictional incentive scheme,
- recovered under any other Commonwealth or State Government scheme, and
- included in the forecast capital or operating expenditure approved in the 2016-20 Distribution Determination or recovered under any other incentive scheme in that determination.

6.5.2 DETAILED INFORMATION – RESIDENTIAL DEMAND RESPONSE PROJECT

Paragraph 6.2 of Schedule 1 to the RIN requires JEN to provide detailed information for each demand management project or program identified in response to paragraph 6.1 of Schedule 1 to the RIN.

6.5.2.1 Compliance

Paragraph 6.2(a)(i) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative complies with the DMIA criteria set out in section 3.1.3 of the DMIS.

JEN has identified that it needs to develop its DR capability for its residential customer base as the residential customers are responsible for driving up the peak demand of the JEN network on hot summer days.

JEN considers that the development of a demand response capability for residential customers complies with DMIA criteria, set out in section 3.1.3 of the DMIS, in the following ways:

- Section 3.1.3-1 – 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.
- Section 3.1.3-2 – 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.
- Section 3.1.3-3 – The project deliverables are to develop Jemena's capability in Residential Demand Response as an effective, economic and efficient peak demand management solution.
- Section 3.1.3-4 – The project is a non-tariff based project and the costs are not recovered under any other incentive scheme.
- Section 3.1.3-5 – The project cost has not been recovered under other schemes. See section 6.5.2.7 of JEN's response for more details.
- Section 3.1.3-6 – The nature of expenditure is operating expenditure.

6.5.2.2 Nature and scope

Paragraph 7.2(a)(ii) of Schedule 1 to the RIN requires JEN to explain the nature and scope of JEN's initiative.

The nature of the project is to develop and demonstrate that a Residential Demand Response solution can provide substantial benefits to address feeder constraints and upstream zone substation and sub-transmission constraints.

The scope of works for Residential Demand Response includes the following key deliverables:

- Develop a project scope for implementing a voluntary (opt-in) Residential Demand Response program.

JEN engaged a consultant to provide the deliverables in the project scope.

6.5.2.3 Aims and expectations

Paragraph 6.2(a)(iii) of Schedule 1 to the RIN requires JEN to explain the aims and expectations of JEN's initiative.

The aims and expectations of the Residential Demand Response are to:

- Understand the benefits, costs and operating modes of Residential Demand Response as a viable peak demand management solution;
- Determine the effectiveness and reliability of Residential Demand Response in reducing peak demand on JEN network.
- Develop JEN's capability in Residential Demand Response.

6.5.2.4 Selection process

Paragraph 6.2(a)(iv) of Schedule 1 to the RIN requires JEN to explain the process by which JEN's project was selected, including its business case and consideration of any alternatives.

Residential Demand Response offers an opportunity for Jemena to manage network risks associated with capacity constraints in network. By undertaking this project, Jemena intends to develop and refine its approach and strategy on cost effective peak demand management solutions.

Residential Demand Response has the potential for economic management of network risks associated with capacity constraint. Jemena can leverage the Residential Demand Response to manage network risk and potentially reduce the overall costs of network operation.

JEN therefore decided to undertake this project to gain a better understanding of the benefits, costs and operating modes of Residential Demand Response as a viable peak demand management solution in order to realise these benefits.

6.5.2.5 Implementation

Paragraph 6.2(a)(v) of Schedule 1 to the RIN requires JEN to explain how JEN's initiative was implemented.

Jemena has taken a collaborative approach with the Consultant on this project in the 2016 Regulatory Year, where Jemena's knowledge on grid side issues and network considerations is combined with the Consultant's expertise on the development of the project scope for a Residential Demand Response program.

The works associated with the Residential Demand Response that were carried in Regulatory Year 2016 have been delivered as follows:

- Development of a project scope for a voluntary (opt-in) Residential Demand Response initiative.

The project scope forms the basis for a business case to be developed in 2017.

6.5.2.6 Benefits

Paragraph 6.2(a)(vii) of Schedule 1 to the RIN requires JEN to explain any identifiable benefits that have arisen from JEN's project, including any off peak or peak demand reduction.

As the Residential Demand Response solution was limited to project scope development there have been no quantifiable benefits in terms of reduction in peak demand.

6.5.2.7 Associated costs

Paragraph 6.2(b) of Schedule 1 to the RIN requires JEN to state whether the costs associated with JEN's initiative have been recovered under other schemes.

The associated costs for Residential Demand Response in the 2016 Regulatory Year have not been:

- recovered under any other jurisdictional incentive scheme,
- recovered under any other Commonwealth or State Government scheme, and
- included in the forecast capital or operating expenditure approved in the 2016-20 Distribution Determination or recovered under any other incentive scheme in that determination.

6.5.3 IMPLEMENTATION COSTS

Paragraph 6.2(a)(vi) of Schedule 1 to the RIN requires JEN to explain the implementation costs of JEN's project.

The actual expenditure for (a) the Commercial and Industrial Solar PV and Battery Storage, and (b) the Residential Demand Response solution incurred in the 2016 Regulatory Year was $44,469, as set out in RIN Template 7.11 DMIS-DMIA (Attachment 1-1 of JEN's response).

6.5.4 TOTAL AMOUNT OF DMIA SPENT AND HOW THIS AMOUNT WAS CALCULATED

Paragraph 6.2(c) of Schedule 1 to the RIN requires JEN to explain the total amount of the DMIA spent in the Relevant Regulatory Year and how it was calculated.

The actual amount spent on (a) the Commercial and Industrial Solar PV and Battery Storage, and (b) the Residential Demand Response solution in Regulatory Year 2016 was $44,469.

The project spend (materials, internal labour and external labour) is collected and tracked in JEN's accounting system.

6.6 DEVELOPMENTS IN RELATION TO PROJECTS OR PROGRAMS COMPLETED IN PREVIOUS YEARS OF THE REGULATORY CONTROL PERIOD

Paragraph 6.3 of Schedule 1 to the RIN requires JEN to provide an overview of developments in relation to projects or programs completed in previous years of the regulatory control period, and of any results to date.

As the Relevant Regulatory Year is the first year of JEN's regulatory control period, JEN has not completed any projects of programs in previous years of the regulatory control period.