

6. Demand Management Incentive Allowance

6.1. Current DMIA Projects

emPOWERing You Trial (formally known as the Tariff Trial)

Network tariff reform is required to deliver on our business strategy of predictable and sustainable pricing. However, we will not be able to successfully deliver on our network tariff strategy without the support of our customers. Therefore the objectives of the emPOWERing You trial include both technical and customer impact aspects. The objectives include:

- Utilise advanced meters and real demand based network tariffs to analyse customer behaviour and customer charge impacts resulting from tariff reform
- Provide sufficient data to support robust analysis which will underpin future refining of the network tariff strategy and network tariff development
- Demonstrate that TasNetworks can effectively support its customers through tariff reform, by providing a platform to consider communication, technologies and to test customer understanding of network tariff offerings
- Demonstrate that customers can be empowered to reduce bills in the short and long term, and that effective tariff choices can help customers make optimal investment decisions in emerging technologies

Battery storage on Bruny Island

The purpose of this project is to prove that distributed energy storage can be used to defer network investment. It involves the installation of customer energy storage systems on Bruny Island to manage peak load on the cable and reduce the use of diesel. It will also provide validation on the parameters of distributed storage as a solution to network issues.

The trial also includes a significant research component that will provide information and strategies that can be used to improve future use of battery storage.

The outcomes of this project are:

- Validated information on the cost and reliability of distributed energy storage for network support
- A strategy for integrating increasing portions of solar and energy storage into the electricity network
- Information on the network support payments required for this solution to be applied to other parts of the network

Demand management processes

This work package aims to develop the internal systems required to use demand management to solve network constraints. The aim of this work is to:

- Use network support to resolve network issues
- Determine the internal costs for using demand management
- Investigate different levels of automation and type of network support

6.2. Explanatory material regarding demand management projects and programmes

TasNetworks notes the AER's advice that that the information provided below is intended to satisfy TasNetworks' annual reporting obligations for the purposes of paragraph 3.1.4.1 of the AER's *Demand management incentives scheme for the current regulatory control period*.

6.2(a)(i). Compliance with DMIA section 3.1.3 criteria

emPOWERing You Trial

The emPOWERing You Trial complies with the DMIA criteria detailed in section 3.1.3 of the demand management incentive scheme in that:

1. The purpose of this project is to both shift and reduce the demand for standard control services through a non-network alternative
2. This project is broad based and not targeted at a particular network user
3. This project is designed to build demand management capability in TasNetworks and provide a new potentially efficient demand management mechanism
4. This project is tariff based
5. The cost to TasNetworks cannot be recovered through any state or federal scheme. This project is not included in forecast capital or operating expenditure
6. This is operating expenditure. There will be no TasNetworks owned asset generated in this project

Bruny Island distributed energy storage trial

The Bruny Island Distributed Energy Storage trial complies with the DMIA criteria detailed in section 3.1.3 of the demand management incentive scheme in that:

1. The purpose of this project is to both shift and reduce the demand for standard control services through a non-network alternative
2. This project is broad based and not targeted at a particular network user
3. This project is designed to build demand management capability in TasNetworks and provide a new potentially efficient demand management mechanism
4. This project is not tariff based
5. The cost to TasNetworks cannot be recovered through any state or federal scheme. Although a contribution is sought from ARENA this cannot cover the entire cost. This project is not included in forecast capital or operating expenditure
6. This is operating expenditure. There will be no TasNetworks owned asset generated in this project

Demand management processes

The demand management processes work complies with the DMIA criteria detailed in section 3.1.3 of the demand management incentive scheme in that:

1. The purpose of this project is to both shift and reduce the demand for standard control services through a non-network alternative
2. This project is broad based and not targeted at a particular network user
3. This project is designed to build demand management capability in TasNetworks
4. This project is not tariff based
5. The cost to TasNetworks cannot be recovered through any state or federal scheme. This project is not included in forecast capital or operating expenditure
6. This is operating expenditure

6.2(a)(ii). Nature and scope of demand management projects

emPOWERing You Trial

The scope of this project is to:

- Gather data on customer usage patterns to improve models and planning using advanced metering technology; and
- Determine customer's response to new tariff designs and the effect it has on the load they place on the network.

Bruny Island distributed energy storage trial

The scope of this project is to:

- Determine the parameters for distributed energy storage as a solution to network issues
- Define the operating model for future applications of this sort of technology
- Determine what actions TasNetworks should take to ensure customers install technology in a way that may be used in the future to manage the network

Demand management processes

The scope of this project is to develop suitable tools and processes to manage demand management as a solution to network problems. This will include:

- Resourcing to dispatch the resources as required; and
- Tools to do the dispatching and gather data.

6.2(a)(iii). Project aims and expectations

emPOWERing You Trial

This project is intended to provide customer behaviour information to allow TasNetworks to make fact based decisions in relation to tariff strategy.

TasNetworks now has twelve months of baseline information on trial participant demographics and electricity consumption patterns. By providing education to participants and measuring change TasNetworks will be able to analyse responsiveness to network pricing signals. This information will drive strategic decision making on tariff design and implementation.

Bruny Island distributed energy storage trial (CONSORT project)

Participating customers had a subsidised battery system installed at their house (with either a new or existing PV system). The battery system automatically operates so as to best manage household load and solar generation, for example storing excess solar generation during the day for use later in the evening, while also helping to manage the electricity network.

The key outcome of the project was that orchestrated customer sited DER successfully managed a network constraint; the batteries and orchestration algorithm were able to deliver a 33% reduction in diesel and completely avoid all diesel generation on one occasion.

- The batteries delivered a value of \$0.66/kWh in avoided diesel.
- The use of batteries at peak times delivered a 33% diesel saving.
- The community remained engaged throughout the project and continue to provide valuable insight.
- A new "Shapley value" based means of pricing network services was demonstrated. This allowed for equitable rewarding of installations that provided the most Network benefit.
- NAC battery orchestration algorithm optimised each customer's consumption.
- Customers were able to modify the optimisation of their consumption.

Key learnings:

- **Process learnings:** Processes to manage the Distribution Network Service Provider, Aggregator and end customers to ensure appropriately managed demand response;
- **Technology learnings:** The Network Aware Coordination algorithm (NAC) orchestrated the DER to provide grid services. Also TasNetworks implemented a Value Reflective Network Services Pricing trial to reward customers for their response; and
- **Trial learnings:** a knowledge bank to ensure all learnings are easily applied to similar trials. Public knowledge sharing reports will be made available at the end of the trial as per ARENA requirements

Demand management processes

The outcomes of this project are developed internal processes that allow for demand management. These processes will:

- Provide a mechanism for TasNetworks to integrate network support into network operations;
- Ensure the network support providers are paid for their services; and
- Integrate network support into planning.

6.2(a)(iv). Project selection

emPOWERing You Trial

This project was selected because of the lack of data available on customer energy usage and the feedback we have received from customers that they need more information in order to support network tariff reform. This project will rectify this issue and test the effect of new tariff designs on network demand.

This was the most cost effective option which provided the required data.

Bruny Island distributed energy storage trial (CONSORT project)

Energy storage is predicted to increasingly be installed by customers to manage their own energy use. Energy storage is a promising method of rectifying network constraints at a much lower cost than traditional network solutions. If energy storage is to be used in this capacity however it is critical that TasNetworks understands the parameters of energy storage as a solution. The key outcomes of this trial are expected to be:

- Understand the future use case for distributed energy storage
- Determine what actions TasNetworks could take to enable a future where this form of support could be used

This project was selected after considering a network owned battery on Bruny Island. The distributed storage had greater promise because:

- The customers can receive benefit from their batteries when they are not required for network purposes
- Customers are already installing batteries themselves. With the appropriate conditions TasNetworks may simply be able to harness existing customer-installed batteries to resolve network issues

The trial is designed in two stages:

- An initial subsidy to create an area where there enough batteries to make a meaningful difference to the network
- Ongoing payments to customers as their batteries are used to manage the network

The ongoing payments are designed to be similar in design and magnitude to what would be economic to continue in the future.

Demand management processes

This project was selected after we determined that we didn't have the appropriate internal tools and processes in place to use demand management.

This current period of low load growth is a good time to investigate network support. A small amount of support can defer network upgrades for a long time.

6.2(a)(v). Project implementation

emPOWERing You Trial

This was implemented through an off-market advanced meter deployment to 600 households located within a single municipality in Southern Tasmania. The trial used a virtual demand-based network tariff and financial incentives to investigate customer behaviour and the resulting impact on their network charges.

Qualitative social research will be undertaken through a series of focus groups, surveys and in depth customer interviews to identify the role TasNetworks can play in the pricing reform transition and how best to explain new pricing structures to electricity customers.

The trial will involve two phases; phase one will involve setting up the customer relationship and the gathering of baseline consumption and demographic information. During phase two TasNetworks will provide education on cost reflective tariffs and incentives to households to manage their electricity usage.

Stage one of the trial is now complete.

Bruny Island distributed energy storage trial (CONSORT project)

This project is being implemented through an ARENA funded multi party project, in collaboration with:

- The Australian National University
- The University of Sydney
- University of Tasmania
- Reposit Power
- TasNetworks

Demand management processes

This project is being implemented by an internal stakeholder engagement process. These series of collaborative workshops aims to co-design processes that are fit for purpose for TasNetworks' unique situation.

6.2(a)(vi). Implementation costs

emPOWERing You Trial actual spend

Expenditure profile	current reporting period
Actual spend	\$468,457.15

Bruny Island Battery Trial (CONSORT project) actual spend

Expenditure profile	current reporting period
Actual spend (net of ARENA funding)	\$558,725.65

Demand management processes

Expenditure profile	current reporting period
Actual spend	\$32,231.46

6.2(a)(vi). Identifiable benefits**emPOWERing You Trial**

This project will assist TasNetworks in modelling customer behaviour and the effect of new tariff designs on network demand.

Bruny Island distributed energy storage trial (CONSORT project)

This project is in progress, due to finish in April 2019. Its current status is:

- Solar/battery systems have been installed;
- The response capability of the batteries have been proven through response to several network events;
- The algorithms under development by The University of Sydney and The Australian National University are beginning to be tested; and
- The University of Tasmania have completed their first round of interviews.

Demand management processes

Draft processes have been developed. These processes have been used on the CONSORT trial to implement the demand management function.

6.2(b)(i). Cost recovery under jurisdictional incentive schemes**6.2(b)(ii). Cost recovery under other Commonwealth or State Government schemes****6.2(b)(iii). Exclusion from approved capital and operating expenditure**

The costs associated with the aforementioned DMIS/DMIA programmes are not:

- recoverable under any other jurisdictional incentive scheme;
- recoverable under any other Commonwealth/State Government Scheme; or
- included as part of the forecast capital expenditure or forecast operating expenditure included in the current Distribution Determination or any other incentive scheme applied by the current Distribution Determination.

6.2(c). DMIA spending in the current reporting period

The total expenditure in the Current Regulatory Period attributable to the Demand Management Innovation Allowance is \$1,059,414.26. The expenditure is calculated from financial records from TasNetworks' accounting system.

6.3 Provide an overview of developments in relation to projects or programs completed in previous years of the regulatory control period, and any results to date

EmPOWERing You trial

This project:

- Has provided enough high quality customer consumption data to allow us to improve our planning processes
- Has provided network performance data to allow us to better identify problem areas in the network;
- Is providing metering data we can use to develop better tariffs and demand response products, and provide this information back to customers; and
- Is testing customer response to cost reflective demand tariffs.

This project is still in progress

CONSORT Bruny Island Battery Trial

This project has demonstrated that demand response can be a solution to network constraints. It:

- Has shown that customer batteries can be aggregated to resolve network issues;
- Is demonstrating innovative new customer-focussed methods of managing network issues;
- Is developing relationships between TasNetworks, service providers, and customers which can be used to provide lower cost solutions to network problems in the future; and
- Is collecting data which we are using to quantify the impact of customer batteries on the network in a winter-peaking region.

As demonstrated in 6.2(a)(vi) above this project is delivering a demonstrable impact on peak demand on Bruny Island. As the project draws to a close TasNetworks will focus on generating learnings that can be applied elsewhere in Tasmania as well as inform processes (such as the Open Energy Networks consultation) that is currently in progress.

Demand Management Processes

This project:

- Has developed processes that allow us to operationally manage network support; and
- Has created basic tools that allow us to manage services from DER.

This project is complete

Demonstration energy storage system

This project:

- Has installed an energy storage system with the appropriate interfaces to demonstrate network support; and
- Has validated the network support model now in use on Bruny Island.

This project is complete