



# Strategy

## Network Innovation

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## Responsibilities

This document is the responsibility of the Network Innovation Team, Tasmanian Networks Pty Ltd, ABN 24 167 357 299 (hereafter referred to as "TasNetworks").

Please contact the Network Innovation Team Lead with any queries or suggestions.

- Implementation All TasNetworks staff and contractors.
- Compliance All group managers.

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# 1 Introduction

The electricity industry is undergoing significant change; much of this change is being driven by disruptive technologies.

This disruption is now the status quo and Innovation will be one of the strategies that will be important to ensuring that TasNetworks continues to maximise the benefits of the existing networks to Tasmanian customers both big and small.

Innovation is required from all areas of TasNetworks. The purpose of this document is to focus the attention of TasNetworks on the key innovations that will assist with the evolution of TasNetworks and provide guidance on the use of innovation more broadly across TasNetworks.

TasNetworks wishes to be, and be seen as being innovative. In the context of the national and international power industry TasNetworks is a small player and generally adopts the approach of being a *fast follower* in terms of adopting new technologies and focus our efforts on being truly innovative in how we apply and make use of the emerging new technologies. In this way we can manage risk and use our compact networks to best advantage. TasNetworks continues to contribute to and learn from other networks in the industry, recognising the issues TasNetworks is facing are not unique.

Customers have an expectation that TasNetworks will be innovative and the metering and tariff reforms currently underway will be important planks in building the perception of TasNetworks as an innovative organisation. This has been a strong message from customers during the recent customer engagement process.

The innovation strategy sets the innovation direction and priorities to 2019. This strategy includes innovation objectives to guide overall innovation, as well as specific initiatives to focus attention and resources.

# 2 Scope

The strategy defines objectives to guide innovation projects at TasNetworks to ensure customer benefits are maximised with the efficient use of resources. The scope of this strategy applies to technical innovation on the transmission and distribution networks specifically. The strategy also defines a targeted innovation work program for implementation until 2019.

# 3 Strategic Context

The TasNetworks' vision to be "trusted by our customers to deliver today and create a better tomorrow" sets a direction to develop a network for the future. The TasNetworks business plan 2015-16 identifies the need to position the business for the future.

The Network Innovation Strategy seeks to contribute to the delivery of this vision, by utilising both mature and emerging technology to the benefit of both TasNetworks and its customers.

The Network Innovation Strategy will assist the implementation of the following TasNetworks strategic initiatives:

- Customer Net Promoter score: through demonstrating innovation to customers;
- Lowest sustainable prices: by developing efficient network alternatives;
- Network service performance maintained: by developing new technologies to improve performance in poorly performing areas; and
- Sustainable cost reductions: improving network utilisation through new technologies and information.

## 4 Environmental Drivers

The need for innovation is heavily influenced by external factors. The key drivers are:

1. changing customer expectations;
2. new technology availability and affordability;
3. past price increases; and
4. regulatory reform (including tariff reform) that aims to assist customers.

### 4.1 Price increases and customer attitudes

Customer attitudes towards the wider electricity supply industry, and specifically network businesses, have shifted in recent years. This is largely attributed to past price increases coupled with technology changes which provide customers with attractive alternatives to the traditional electricity supply model.

Customers with trade exposure, facing continuous pressure to reduce costs, are increasingly looking for more options to achieve efficiencies.

Customers are now expecting a level of innovation in all of their services, and TasNetworks' surveys show customers rank innovation highly.

### 4.2 Technology

Solar photo-voltaic (PV) technology continues to be adopted by customers. Battery storage has now started to be adopted by customers. These technologies together have the potential to fundamentally shift customers' requirements of a network: customers will want to draw energy from the network at times of low prices, but use or export their stored energy at other times. Some customers see battery technology as an opportunity to leave the grid. This change of usage introduces technical and economic challenges to the network. It also presents TasNetworks with opportunities not previously available.

### 4.3 Regulatory Reform

Significant regulatory reform has been introduced to the NEM following the Power of Choice review. The Power of Choice changes aim to make the structural market reforms which will allow competing retailers to offer new products and services to customers. Mainland retail offerings to date have focussed around new tariffs, solar PV, battery energy storage, and greater data and information. The Tasmanian market is yet to see vigorous retail competition, and so far has seen little development of new products and services.

Tariff reform, in the form of cost reflective tariffs, is expected to be a driver for customers to alter their usage of the network. Time of use tariffs and tariffs with a demand component are designed to provide a price signal to customers. This signal provides incentives to adopt technology, such as battery storage to reduce the customer's contribution to peak demand.

## 5 Network Innovation Objectives

Network innovation objectives have been selected to guide the strategy. The three objectives are:

1. Facilitate customer choice to allow further adoption of technology
2. Facilitate customer interaction to allow high quality and data rich interaction
3. Increase network utilisation and efficiency to reduce network charges

## 5.1 Facilitate Customer Choice

The advent of solar PV and its continued adoption by residential and small business customers, even in the absence of financial incentives, has demonstrated the customer's desire for some level of choice in their energy supply. Conversely, other customers either do not have the interest or capacity to engage with the network through technology. These customers simply want a cost efficient connection; the breadth of service offerings will need to increase. Larger industrial customers have expressed the desire to share risks with TasNetworks, and TasNetworks needs flexibility to offer connections with different levels and reduce costs of reliability.

The Network Innovation strategy must facilitate greater customer choice.

## 5.2 Facilitate Customer Interaction

Customers are now offered digital interaction alongside many non-electrical services and now expect this from TasNetworks. Industries such as insurance, banking, airlines, and couriers have all sought to maximise their interactions with customers through digital interaction.

TasNetworks and our customers will both realise value through increased digital interaction. Customers will benefit through up to date information on outages, updates on emerging and current network issues, and practical advice on technology choices. TasNetworks will benefit through greater engagement and trust, strengthening its social licence to execute its strategy.

Innovation projects will develop material to communicate to customers and provide information and advice on technology advancements.

## 5.3 Increase Network Utilisation and Efficiency

A cost effective and technically efficient network is essential to ensure sustainable pricing of network services. Many new and innovative technologies can address existing and emerging issues. The key network issues facing TasNetworks are:

- localised peak demand and voltage issues;
- asset management, fault and emergency costs;
- the risk of asset stranding from uncertain load growth;
- expensive to maintain edge-of-grid assets (such as SWER networks);
- accurate and timely distribution network data for decision making;
- network constraints
- localised lower reliability performance

# 6 Strategic Approach

## 6.1 Business Models

The approach is to focus on core business initially, and deploy technology to assist in running a regulated network business, with consideration to leveraging this experience in entering new markets a future point. For example the experience in developing network side remote area power supplies can build business capability prior to entering the market.

The Network Innovation strategy focuses on technology solutions to regulated network business issues primarily, in alignment with TasNetworks' Strategy.

## 6.2 Cross team innovation

It is important to note this strategy should not limit innovation at TasNetworks to the projects herein. The strategy focusses and prioritises projects in the current environment, and in alignment with the TasNetworks Strategy, and to provide guidance to other business units to prioritise innovation projects.

All areas of TasNetworks including Works and Service Delivery, Strategic Asset Management, Customer Engagement and Network Operations and Strategy and Stakeholder relations will use this strategy for guidance.

## 7 Network Innovation Initiatives

TasNetworks has selected the following initiatives to achieve the Network Innovation objectives. Each initiative has alignment with one or more of the objectives. The following program has been designed to be concise, achievable and flexible in response to technology and market changes.

### 7.1 Non-Network Generation Assets

TasNetworks' network includes many long distribution lines which each supply only a handful of customers. These lines are expensive to maintain relative to the revenue generated and present bushfire and reliability risks. Installing small generators close to the customer and removing the line may be a more economical solution in certain circumstances. TasNetworks has implemented its first stand-alone power supply at Crotty Dam, which has been in service for 18 months. Seven more potentially economically viable sites have been identified.

This initiative focuses on network efficiency and may be leveraged in the future to provide greater choice to customers.

### 7.2 Demand Management Processes

TasNetworks has localised peak demand issues or new customer connections that, in the absence of any intervention, would require network augmentation. Demand management is an alternative approach, involving working with customers to reduce demand to within the existing network's capacity. It is a technically viable option, but has a level of uncertainty and risk that needs to be quantified before TasNetworks can confidently deploy it in lieu of traditional options. TasNetworks has selected a range of demand management approaches to further understand the options:

1. Residential customer battery storage
2. Commercial & Industrial demand response
3. Customer standby generators as peak shaving

The demand management work focusses on giving customers the opportunity to help TasNetworks resolve issues, as well as unlocking value for customers. In the case of the residential customer battery storage, the concept also delivers information to customers and TasNetworks. The Residential Customer Battery project will provide many opportunities to demonstrate TasNetworks' leadership in this area.

### 7.3 Electric Vehicles

Electric Vehicles (EV) pose a risk and an opportunity for TasNetworks: uncontrolled charging could exacerbate peak demand issues, however electric vehicle use in general should improve the usage of the network. Increased electric vehicle usage will also bring benefits at a state level: reduced export expenditure on petroleum, increased local electricity sales, reduced greenhouse gas emissions, and contribution to the "clean green Tasmania" image.

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TasNetworks is trialling the use of EVs within the fleet to understand the benefits to the business, as well as gain experience in the impact of charging on the network. TasNetworks needs to develop EV charging policies that balance the need to manage peak demand with the desires of customers. TasNetworks also has a broader leadership role in the development of policies to encourage greater uptake of electric vehicles. This may include involvement with public EV charging infrastructure development, provision of information about electric vehicle charging, and general promotion of electric vehicles.

Leadership in EVs provides opportunities to demonstrate innovation, and promotes an emerging product which could bring long term business benefits.

## 7.4 Network Monitoring and Control Program

Advances on network monitoring and control have occurred in recent years, leading to the Smart Network concept. TasNetworks has already begun to take advantage of many technologies and must continue to deploy technological innovations. The following technologies have been identified for progression within the Network Innovation Strategy:

1. Distribution feeder automation
2. Dynamic transformer and line ratings
3. Monitoring devices
4. Low Voltage Regulation
5. FuseSavers
6. Voltage control schemes
7. Flexible AC Transmission Systems (FACTS)

The technologies selected focus on ensuring the network is capable of accepting the new technology choices being made by customers, as well as improving the overall network efficiency.

## 7.5 Mesh Radio

TasNetworks requires a communications network to realise the “smart” functionality available from modern distribution network devices, including the Network Innovation Initiatives previously described. The transmission network is adequately covered by TasNetworks’ own communications network; however the distribution network uses the public 3G network. The public 3G network is not sufficiently secure, reliable, or scalable. A TasNetworks owned and operated mesh radio network is proposed, integrated with existing TasNetworks communications infrastructure. The project currently is progressing through trial phase, due for completion in 2016.

## 8 Resourcing

The Network Innovation Strategy will be resourced across TasNetworks within the current business structure and resourcing levels. The increasing complexity technology impacts on the skills and capability required to manage it. There is an increasing focus on digital control, monitoring and communications in the distribution network requiring a greater level of skills in this area.

The Network Innovation team will drive the Innovation work program, and will dedicate engineering resources toward the projects. Network Innovation will generally be the works initiator along with other Strategic Asset Management teams under the Monitoring and Control projects.

The implementation will follow the Works Program End to End Process, and draw on resources across the business. The projects are generally complex in nature, raising many risks. Customer engagement, by design, is a key element to the strategy; the Customer Engagement team will be engaged early in each project.



## 9 Risks

The major risks in delivering this strategy are shown below in Table 1:

**Table 1 Network Innovation Risks**

<b>Risk</b>	<b>Description</b>	<b>Mitigation</b>
Technology	Unproven technology on Tas. Network may fail, or cause project delays	The approach is to conduct trial phase, including lab testing, and then implement in full if successful. Learn from other utilities and forums. Risk sharing contracts. Business acceptance of appropriate risk.
Resourcing	The appropriate skills and resource availability is essential to success	Limit the breadth of Innovation program to ensure resources are not too thin. Obtain specialist external support as required
Ongoing business buy-in	There is a risk that the technology won't be accepted by the business	Collaborate and engage across the business. Ensure technology champions are identified early in projects, and maintain close relationship throughout. Engender confidence in the rest of business through a high standard of project implementation.

## 10 Budget

The Innovation Strategy will be funded within the existing capital and operating budgets. In some cases, budgets have already been obtained in the current regulatory periods, or proposed with the coming distribution regulatory period.

Several projects include a technology development phase, and this phase is funded with the Network Innovation Strategy. Ongoing implementation, once a technology is proven, will be funded through the works program with specific funding approval.

The total funding required for the Innovation required is shown below in Table 2 including the contribution of the Demand Management Innovation Allowance (DMIA).

**Table 2 Network Innovation Budget**

<b>Budget</b>	<b>15/16</b>	<b>16/17</b>	<b>17/18</b>	<b>18/19</b>
Technology Development	\$1,194k	\$500k	\$267k	\$462k
Ongoing Implementation		\$565k	\$1,253k	\$1,279k
DMIA	\$725k	\$640k	\$379k	\$379k