TasNetworks
Delivering your power

Strategic Asset Management Plan

2015

Tasmanian Networks Pty Ltd
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This document has been produced with the assistance of GHD Pty Ltd.

Cover photo: Greg Gibson took this beautiful shot of the Aurora Australis behind a transmission tower on the Palmerston to Hadspen 110 kV transmission line at Bishopbourne, 30kms Southwest of Launceston.

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Message from the GM Strategic Asset Management

Tasmanian Networks Pty Ltd (TasNetworks) commenced operations on 1 July 2014, with the merger of Aurora Energy's distribution network (the poles and wires) and Transend Networks' transmission network (the big towers and lines).

We supply the power from generation sources to over 280,000 customers in homes and businesses across Tasmania through a network of transmission towers, substations and power lines worth approximately $3 billion. TasNetworks also owns and operates a high-reliability telecommunications network that supports the operation of the electricity network, and we also provide communications services to other customers. TasNetworks is owned by the Tasmanian Government.

It is our vision that we will be: "Trusted by our customers to deliver today and create a better tomorrow". Our purpose is to: "Deliver electricity and telecommunications network services, creating value for our customers, our owners and our community".

I am pleased to present our Strategic Asset Management Plan, which outlines our systems and strategies targeted to effectively and efficiently manage the delivery of electricity and telecommunication network services to customers and to provide information to stakeholders regarding the environment in which we operate. Key themes supporting our asset management approach and associated levels of investment are:

- caring for our assets to ensure safety is not compromised;
- maintaining reliability of the network;
- where we can safely do so, running our network harder rather than building more;
- taking a whole of life (life-cycle) approach to optimise cost and service outcomes for our customers; and
- working hard to ensure we deliver the lowest sustainable prices.

Mr Wayne Tucker
General Manager
Strategic Asset Management
TasNetworks Pty Ltd

Chapter 1

Introduction and Context

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1.1 Purpose

The purpose of this document is to outline our systems and strategies targeted to effectively and efficiently manage the delivery of electricity and telecommunication network services to customers and to provide information to stakeholders regarding the environment in which TasNetworks operates. TasNetworks stakeholders include: shareholders, customers, regulators, policy makers, industry groups, land owners, employees and the general public.

This document aims to provide alignment between our stakeholder's requirements, the organisational objectives and the resulting asset management objectives, to ensure that the assets are being managed to provide the value required of them by the organisation and stakeholders. This document also aims to meet the requirements of the ISO 55000 series of asset management standards (see section 2.2).

This Strategic Asset Management Plan is part of a suite of documents that are required to satisfy TasNetworks electricity transmission and distribution licence obligations and support the safe and efficient delivery of network and telecommunication services.

1.2 Scope

This document includes the physical assets, systems and processes that are required for the provision of electricity and telecommunication network services.

1.3 Planning Period and Review

This document covers a nominal planning period of thirty years and is typically reviewed every two and a half years.

1.4 Who is TasNetworks

Tasmanian Networks Pty Ltd (TasNetworks) delivers electricity and telecommunication network services, creating value for our customers, our owners and the community. We commenced operations on 1 July 2014. We were formed from the merger of the distribution business of Aurora Energy Pty Ltd, previously owner, operator and maintainer of the electricity distribution network, and Transend Networks Pty Ltd, previously owner and operator of the electricity transmission network. TasNetworks is owned by the Tasmanian Government.

TasNetworks is the sole licensee for regulated transmission and distribution network services on mainland Tasmania and Bruny Island. We are registered with the Australian Energy Market Operator (**AEMO**) as both a Transmission and Distribution Network Service Provider (**NSP**) and operate in the National Electricity Market (**NEM**). TasNetworks is unique in the NEM in that it is the only combined Transmission and Distribution NSP providing services to all customers in its jurisdiction.

As a monopoly provider of transmission and distribution network services, our revenue for these services is regulated. We prepare submissions to the Australian Energy Regulator (**AER**) who determines our revenue and the maximum amount we can recover from customers, generally for periods of five years. We are presently transitioning the timing of the distribution revenue period to align with the transmission revenue period, in alignment with our corporate strategy of "One Business". This results in the next distribution revenue period being for a period of two years.

1.5 What We Do

TasNetworks owns, operates and maintains the transmission and distribution electricity networks on mainland Tasmania and Bruny Island. We deliver electricity generated from our generation customers at hydro-electric, wind and gas-fired power stations to our more than 280,000 demand customers throughout the state. Our demand customers range from domestic and commercial customers to major energy users connected directly to the transmission network. Our network also allows electricity generated from private embedded generating units to be transported to other customers. The widespread adoption of rooftop photo-voltaic (PV) systems by private customers has dramatically increased the use of the network for this purpose in recent years.

We also facilitate the transfer of electricity to and from mainland Australia within the NEM. The NEM operates on an interconnected power system that extends from Queensland to South Australia, including a connection to Tasmania via the Basslink interconnector. Basslink is a privately-owned under-sea cable between George Town in Tasmania and Loy Yang in Victoria and can transfer electricity in either direction.

TasNetworks also owns and operates a high-reliability telecommunications network. This network supports the operation of the electricity network, and we also provide telecommunications services to other customers. We also own and operate non-network assets to support and facilitate the operation of the business. These assets include buildings, vehicular fleet and information systems.

What it takes to deliver your power

TasNetworks is responsible for the **design**, **construction**, **reliability** and **maintenance** of the network that supplies power from the generation source to Tasmanian homes and businesses.

The network is made up of:

Transmission

3,500
circuit kilometres of transmission lines

8,500
transmission line support structures

11,000
hectares of easements

Distribution

15,000
kilometres of high voltage powerlines

5,000
kilometres of low voltage powerlines

2,000
kilometres of high and low voltage underground cables

222,000
poles

1.6 Document Structure

The remainder of this document is structured as follows:

Chapter 2: Shows how TasNetworks has developed an integrated asset management system framework, together with supporting processes and systems, to ensure that our performance objectives are consistently achieved.

Chapter 3: Discusses relevant aspects of TasNetworks strategic asset management including stakeholder engagement, corporate objectives, asset management policy, asset management objectives, the regulatory framework, revenue determinations and investment planning.

Chapter 4: Provides an overview of the Tasmanian electricity supply system. It discusses the entities in the supply chain and their responsibilities. It points out those aspects of the Tasmanian electricity system that are distinctly different from mainland Australia power systems.

Chapter 5: Shows the roles and responsibilities within TasNetworks' organisation structure, and the organisational roles reporting within it.

Chapter 6: Shows how TasNetworks is building a high performance culture and high levels of employee engagement to support achievement of our business objectives and enable us to be sustainable.

Chapter 7: Presents the risk management framework, the operational risk management process and how asset condition and risk is managed.

Chapter 8: Presents the electricity demand forecasts for the Tasmanian power system.

Chapter 9: Discusses TasNetworks life-cycle approach to asset management and the resulting key asset strategies aimed at achieving our asset management objectives and corresponding corporate objectives.

Chapter 10: Describes the development of our Asset Management Plans, Area Development Plans and the Annual Planning Report.

Chapter 11: Focuses on the performance of the network in recent years. It also discusses an independent asset management (AM) maturity assessment and the resulting asset management improvement program.

Appendix A: Asset Management Policy

Appendix B: Zero Harm Policy

Appendix C: Glossary and Abbreviations – common electricity industry definitions and abbreviations provided to assist readers who may be unfamiliar with particular industry terminology.

Chapter 2

Asset Management System Framework

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2.2 Asset Management System Framework 8

2.1 Overview

This chapter shows how we have developed an integrated asset management system framework, together with supporting processes and systems, to ensure that performance objectives are consistently achieved.

2.2 Asset Management System Framework

TasNetworks asset management system is being further developed in alignment with the ISO 55000 series of asset management standards with the aim of achieving the following benefits:

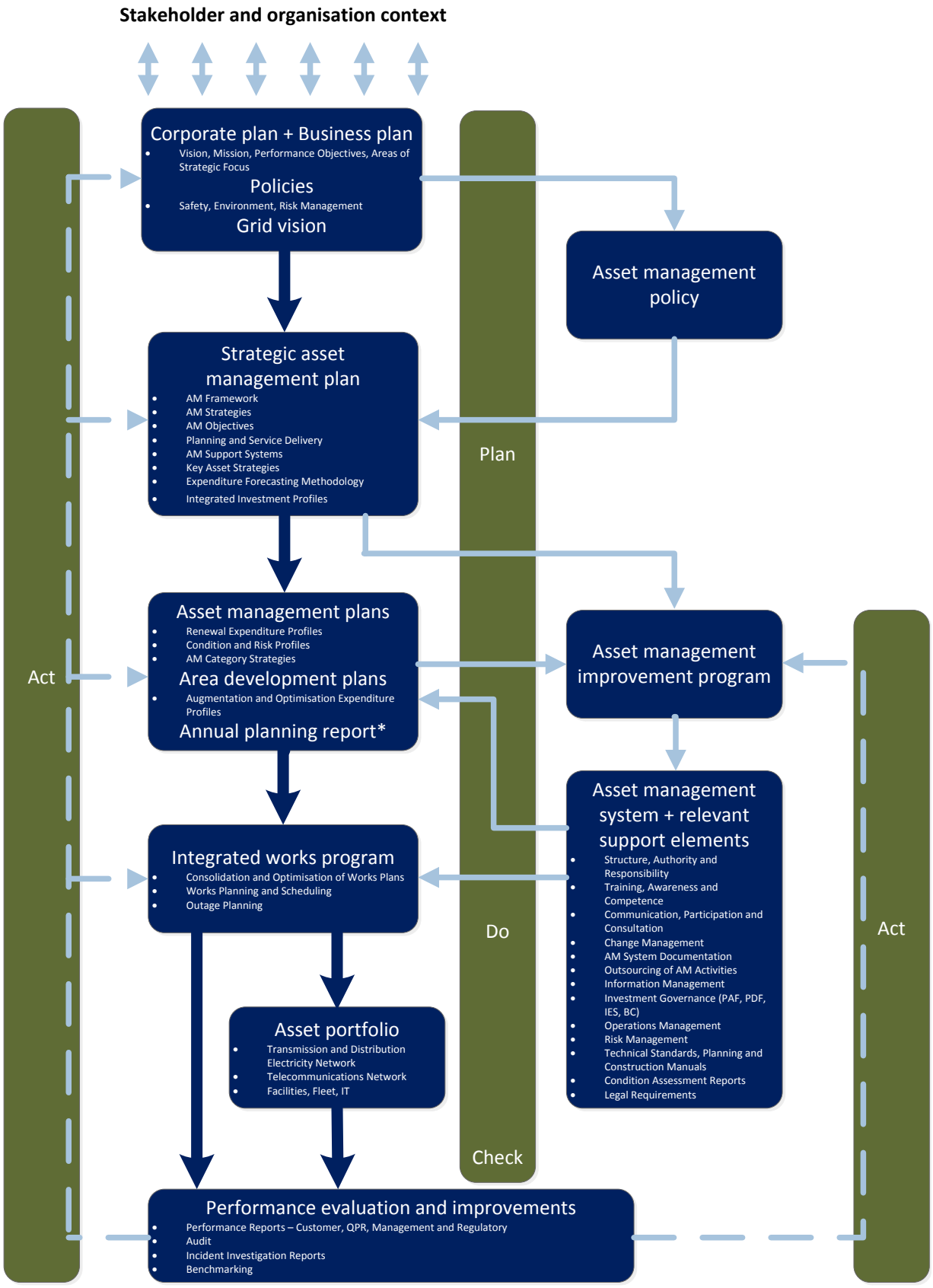
- Lower asset management costs over the long term;
- Alignment of strategic initiatives across the asset management system;
- Increased engagement of our people, including leadership, communications and cross-disciplinary teamwork;
- Alignment of processes, resources and functional contributions;
- Better understanding and usage of data and information to provide consistent and informed decisions;
- Consistent, prioritised and auditable risk management;
- Improved asset management planning;
- Improved customer service, and maintaining overall network performance;
- Increased auditability across the asset management life-cycle; and
- Reduced regulatory risk through implementing robust and demonstrable asset management governance processes.

The ISO 55000 series of standards are the internationally accepted standard for asset management that comprises three separate standards:

1. ISO 55000:2014 provides an overview of asset management;
2. ISO 55001:2014 specifies the requirements for the establishment, implementation monitoring and improvement of an asset management system; and
3. IS0 55002:2014 provides guidance for the application of the asset management system.

TasNetworks asset management system framework is presented in Figure 1. This framework has been developed with close alignment to ISO 55001, and in particular the relationship between the key elements of an ISO 55000 AM system. The ISO compliant framework aims to ensure that the systematic approach to asset management delivers prudent and efficient outcomes that meet both the Corporate objectives and the Asset Management Objectives.

Figure 1 Asset management system framework



* The Annual Planning Report (APR) is a requirement of sections 5.12.2 and 5.13.2 of the National Electricity Rules (NER) and also satisfies a licence obligation to publish a Tasmanian Annual Planning Statement (TAPS). The APR is a compilation of information from the Area Development Plans and the Asset Management Plans.

Chapter 3

Strategic Asset Management Considerations

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3.1 Overview

This chapter discusses relevant aspects of TasNetworks strategic asset management including stakeholder engagement, corporate objectives, asset management policy, asset management objectives, the regulatory framework, revenue determination and investment planning.

3.2 Stakeholder Requirements

Our shareholders expect us to deliver an appropriate return on their investment. Our plans strike the right balance between lowest sustainable prices to customers and an appropriate return on investment in line with the regulatory allowances. To deliver on both these goals we have to continue to implement and achieve efficiencies.

To achieve the stakeholder requirements we have developed the following strategic goals:

- Understand our customers by making them central to all we do;
- Enable our people to deliver value;
- Care for our assets, delivering safe and reliable network services while transforming our business; and
- Deliver sustainable shareholder outcomes.

3.3 Stakeholder Engagement

TasNetworks works with our stakeholders to:

- Understand the issues we face;
- Help to identify options to address these issues;
- Influence what changes we make to the network;
- Help to clarify the decisions we must make; and
- Gain support for the decisions that we make.

We have a broad group of stakeholders who have many different contact points across the business. As a newly merged business, we are working to develop a consistent approach to engaging with our stakeholders, as well as driving our commitment and approach to building strong relationships.

We are improving our engagement with our stakeholders and are supporting this with a formal, business-wide stakeholder engagement strategy, with the key objectives being to:

- Build a consistent approach to stakeholder engagement across the business;
- Ensure stakeholders have two-way communication mechanisms so their issues and feedback can be heard and considered;
- Proactively engage with all stakeholders to build two-way understanding in developing TasNetworks' strategic direction;
- Support our people with their stakeholder interactions; and
- Ensure we meet our regulatory requirements to consult and engage with our customers.

Our customers can be segmented into six distinct categories as shown in Figure 2.

Figure 2 TasNetworks' Customer Segmentation Model

TasNetworks has been undertaking extensive customer engagement sessions. At the engagement sessions held to-date, our customers were asked, in relation to our vision statement, to identify what 'a better tomorrow' meant to them. The key themes arising from the feedback are set out in Figure 3.

Figure 3 Customer requirements

3.4 Relationship with Organisational Strategic Objectives

To deliver the customer requirements and strategic objectives TasNetworks will:

- Implement our 'Voice of the Customer' program and related initiatives to deliver improved customer service, tailored to our customer segments;
- Provide predictable and sustainable pricing to our customers;
- Deliver a high-performance culture to enable change and deliver improved outcomes for our customers and our shareholders;
- Deliver a TasNetworks enterprise agreement that supports our strategic goals;
- Develop efficient, integrated business systems which enable our people to deliver value; and
- Develop our business excellence framework incorporating continuous improvement of our asset management systems, business processes and governance frameworks.

In Figure 4 below the organisation's goals are summarised in the TasNetworks Corporate Plan 2015-16 to 2019-20 'Strategy on a page'. It also visually outlines how we will deliver on our strategic goals.

Figure 4 TasNetworks 2015-16 Business Strategy

3.5 Relationship to Other Functional Objectives

We also have a number of related, important issues to work through with our customers. These include:

- Our future distribution tariff strategy including a small advanced meter trial;
- Improving our customer connection processes;
- The two-year distribution determination for 2017-19, to be submitted to the Australian Energy Regulator in January 2016;
- Transitioning to one transmission and distribution revenue reset commencing 2019; and
- Proactively leading and implementing actions identified in the Tasmanian Energy Strategy[1].

3.6 Asset Management Policy

To aid 'line of sight' and alignment of our asset management activities to our strategic goals, TasNetworks Board has approved the asset management (AM) policy, which is shown in Appendix A.

The AM policy applies to all TasNetworks assets and associated activities and is the overarching document that guides the AM system. The AM policy provides a critical platform for TasNetworks to deliver our vision to be trusted by our customers to deliver today and create a better tomorrow. Key factors that have been considered during the development of the AM policy include:

- Understanding the organisation and its context;
- Understanding the needs and expectations of the stakeholders, including customers;
- Defining leadership involvement; and
- Organisational roles, responsibilities and authority.

Key aspects of the AM policy are that it:

- Applies to all assets managed by TasNetworks;
- Applies to all stages of the asset life-cycle (stakeholder needs, demand analysis, strategic planning, technical requirements, works management, decommissioning and disposal, performance analysis);
- Is aspirational in some areas; and
- Is dependent on commitment from leadership.

3.7 Asset Management Objectives

The asset management objectives have been designed to align with the asset management policy and the organisational objectives, and thereby ensure clear 'line of sight'. The AM objectives state the outcomes required from the asset management system and the program to ensure TasNetworks' strategic goals are met.

The asset management objectives focus on six key areas:

- **Zero Harm**[2] will continue to be our top priority and we will ensure that our safety performance continues to improve, and our asset risks are managed consistent with our Risk Management Framework.
- **Cost Performance** will be improved through prioritisation and efficiency improvements that enable us to provide predictable and lowest sustainable pricing to our customers.
- **Service Performance** will be maintained at current overall network service levels, whilst service to poorly performing reliability communities will be improved to meet prescribed performance criteria.
- **Customer Engagement** will be improved to ensure that we understand customer needs, and incorporate these into our decision making to maximise value to them.
- Our **Program of Work** will be developed and delivered on time and within budget.
- Our asset management **Capability** will be continually improved to support our cost and service performance, and efficiency improvements.

1 *Tasmanian Energy Strategy 'Restoring Tasmania's energy advantage', Tasmanian Government Dept. of State Growth, May 2015.*

2 *TasNetworks' Zero Harm Policy for Health, Safety, Environment and Quality is shown in Appendix B.*

3.8 The Regulatory Framework

TasNetworks operates under both jurisdictional and national regulatory regimes. As a participant in the NEM, we are required to develop, operate and maintain the electricity supply system in accordance with the National Electricity Rules (**the Rules**). In addition, there are local requirements that we need to comply with under the terms of our licences issued by the Tasmanian Economic Regulator under the Tasmanian Electricity Supply Industry Act 1995. We are also subject to a number of industry-specific Tasmanian Acts and Regulations including (without limitation):

- The Tasmanian Electricity Code (the Code);
- Electricity Industry Safety and Administration Act 1997;
- Electricity Companies Act 1997;
- Electricity Wayleaves and Easements Act 2000;
- Electricity Ombudsman Act 1998; and
- Electricity Supply Industry (Network Planning Requirements) Regulations 2007.

The AER is responsible for the regulation of electricity transmission and distribution services in the NEM. This includes responsibility for determining the maximum allowable revenue for regulated electricity network service providers.

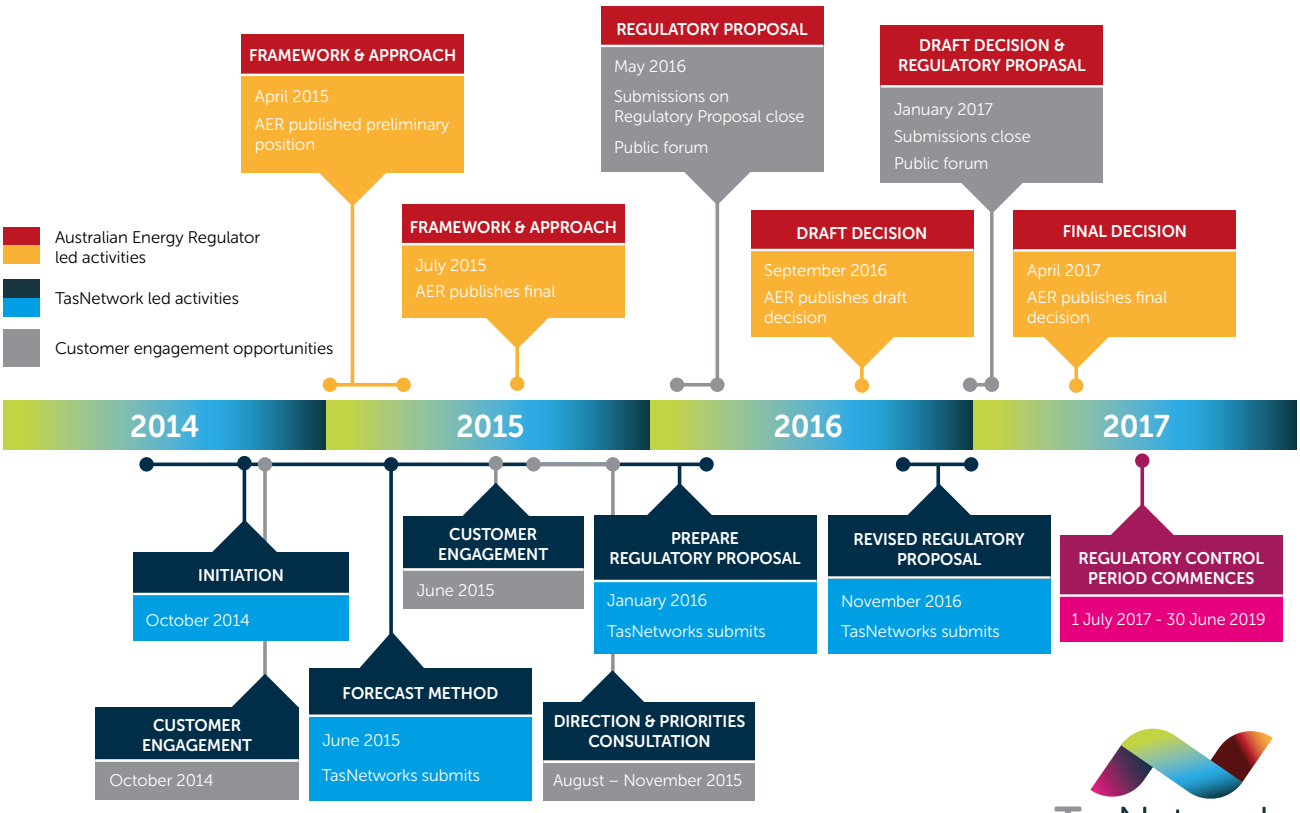
3.9 Revenue Determination

The revenue we earn from providing monopoly transmission and distribution services is set by the AER. This is currently done separately for transmission and distribution services. We effectively prepare two proposals for the AER which outline our expenditure plans to efficiently provide network services for nominally five-year periods.

The Revenue Proposal for the Tasmanian electricity transmission network was submitted in May 2014 for our 2014-19 regulatory control periods, and the AER accepted our proposal which is an unprecedented outcome. The current Distribution Determination cycle commenced on 1 July 2012 for the 2012-17 regulatory control period. TasNetworks is continually seeking ways to provide services to its customers as efficiently as possible.

The merger of the distribution and transmission networks businesses to create TasNetworks has provided us an opportunity to 'merge' the respective regulatory determination processes for both networks. We are working to align the transmission and distribution determination processes in 2019 via a two year distribution reset in 2017. The intended outcomes of merging the determination processes is to reduce costs through combined planning, contribute to our strategic objective of 'one business' and allow us to engage meaningfully with our customers on all network services offered by TasNetworks. Figure 5 shows the roadmap for the Distribution Reset 2017-19.

Figure 5 Distribution Reset 2017-19 Roadmap



There are many opportunities for stakeholders to engage in the regulatory process.

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3.10 Integrated Investment Planning

Asset strategy management and asset planning considers all customer and stakeholder requirements and determines appropriate solutions to ensure that the performance of the transmission and distribution network is maintained. The outcome of this activity is operational and capital works plans. To allow effective integration and conduct of its works plans, TasNetworks must develop an overall works plan, encompassing all projects and including consideration of their impacts on the network and non-network assets.

The capital plan is a combination of area development plans and asset management plans for the various asset classes. These plans are integrated to develop an integrated investment plan. This ensures that opportunities are identified to minimise expenditure, for example:

- Asset renewals and maintenance at sites affected by augmentations are coordinated to minimise outages and rework;
- Maintenance is deferred or minimised, for assets that are to be replaced by augmented assets; and
- Renewal and development expenditure project contracts are bundled to achieve economies of scale.

3.10.1 Investment Evaluation

TasNetworks has developed guidelines that specify the steps that need to be undertaken and key considerations during the investment evaluation of projects involving network assets. These guidelines provide assistance to personnel involved in the justification of investment projects by:

- Identifying the various types of projects;
- Specifying the need for each of these steps;
- Providing guidelines as to how these steps are to be implemented;
- Identifying the inputs and outputs to various steps of project justification; and
- Linking various systems, processes and tools, to provide a consistent basis for project justification.

3.10.2 Gated Investment Process

TasNetworks maintains a gated investment process framework that outlines the governance structures guiding the evaluation and determination of capital investment decisions.

The framework demonstrates that TasNetworks has in place and applies the required technical, managerial and financial governance processes to ensure:

- Investments meet mandated legal and regulatory obligations in a cost-effective manner and comply with the specific capital expenditure objectives and criteria stipulated in the NER;
- Investments are aligned with justified development plans and strategies, provide a reliable electricity network service, add capacity efficiently to meet forecast load growth and cater for new connections to the electricity and distribution networks;
- Investments are aligned to asset management plans; and
- Capital expenditure is prudent and results from a demonstrably prudent and efficient asset investment and management governance framework.

3.10.3 Timing and Deliverability of Works Program

TasNetworks optimises its proposed works program in terms of capital and operating tasks. In particular, the optimisation of the timing and sequencing of asset renewal projects takes into account a number of factors, including the costs and benefits of aligning asset renewal with augmentation or connection projects or with maintenance activities. In particular, optimisation is undertaken:

- to achieve sustainable shareholder returns and customer prices;
- to ensure the achievement of corporate goals;
- across the entire asset base, both network and non-network;
- to maintain performance;
- to ensure an acceptable risk profile across all assets; and
- to ensure delivery of the works program.

Timely delivery of the capital works program is essential to minimise the likelihood of additional operating expenditure to sustain assets beyond their expected service lives where run-to-failure is not employed.

3.10.4 Investment Funding Requirements

The actual and forecast integrated investment funding requirements, for managing the transmission system are as shown in Figure 6 by investment type.

Figure 6 Transmission funding requirements

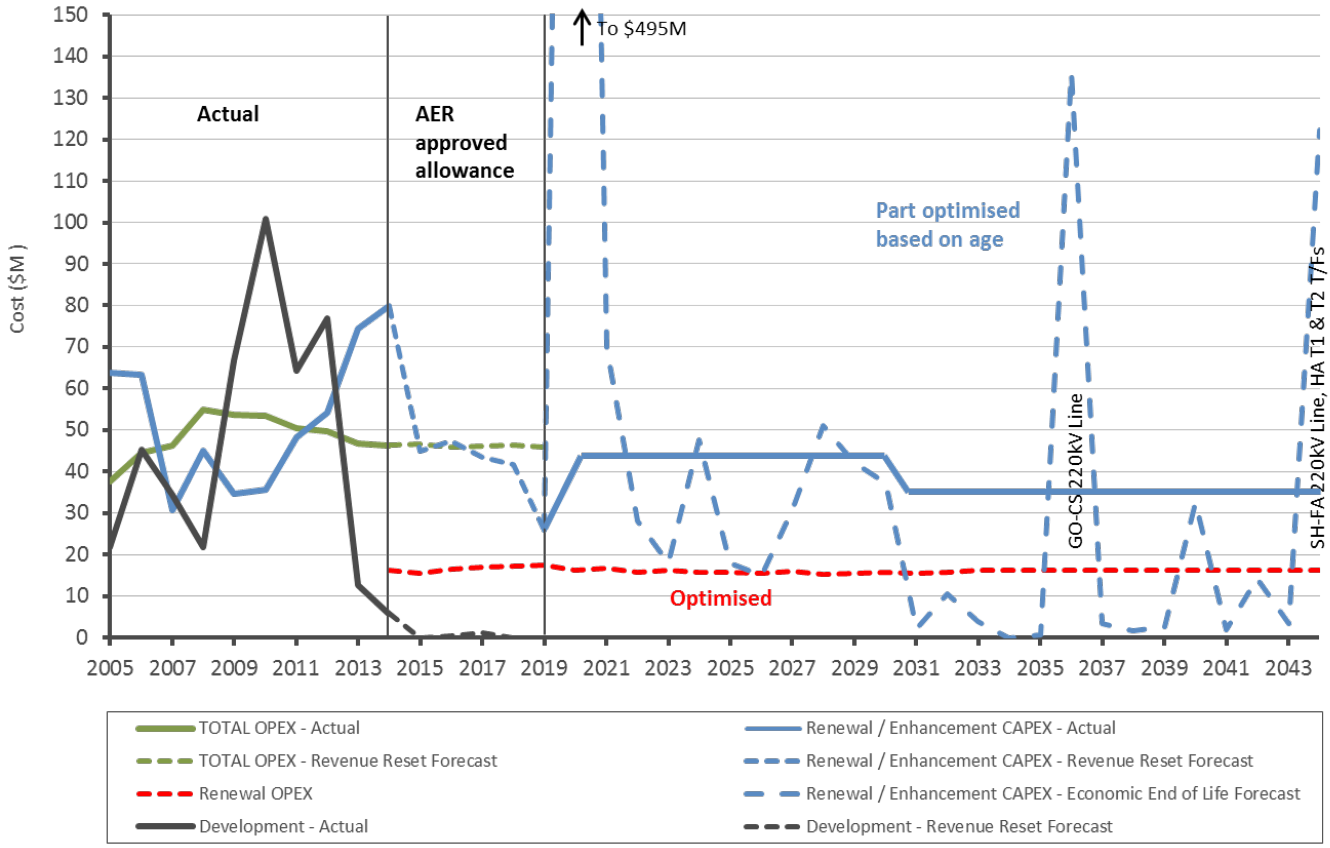
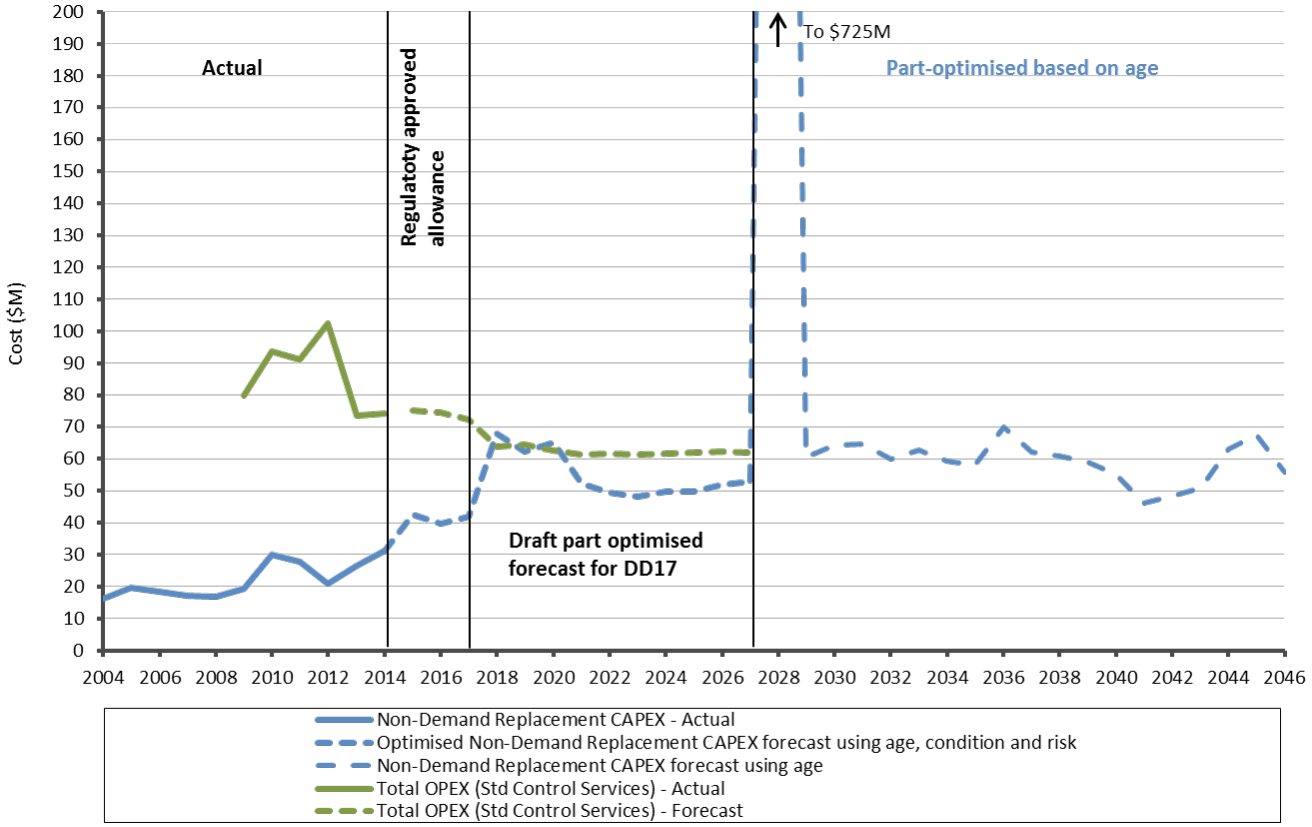


Figure 6 shows that over the past three years TasNetworks has been reducing its total actual spend and forecasts to continue this overall declining total spend for the next six years. This reduction in total spend is largely attributable to a significantly reducing development spend in recent years due to a decline in customer connections, more efficient asset utilisation and reducing Tasmanian load.

Figure 6 also shows that the recent expanded renewal/ enhancement program to the transmission network peaked in 2014 and is forecast to decline to a reduced level over the next five years. We have also been rigorously pursuing reductions to operating costs, limiting increases to less than CPI, and forecast to reduce operating costs in real terms to provide lower costs to customers and ongoing returns to shareholders.

Figure 7 Distribution funding requirements



The actual and forecast integrated investment funding requirements, for managing the distribution system are as shown in Figure 7 by investment type.

Figure 7 shows that over the past three years TasNetworks has been reducing its total actual operating spend and forecasts to continue this overall declining total spend for at least the next seven years. Like transmission, we have also been pursuing reductions to distribution operating costs, limiting increases to less than CPI, and forecast to reduce operating costs in real terms to provide lower costs to customers and ongoing returns to shareholders.

3.10.5 Key Forecasts

Table 1 below illustrates our key forecasts[3] from 2015-16 through to 2019-20, including likely end of year result for 2014-15:

- Profit before tax – $113.7 million in 2015-16;
- Returns to Government – $179.9 million in 2015-16 (includes $50 million equity transfers);
- Total assets – $3.3 billion;
- Operating expenditure – $138.9 million in 2015-16 ($21 million savings achieved from merger);
- Capital expenditure program – $175.4 million in 2015-16; and
- Borrowings: $1.8 billion in 2015-16 increasing over period to $1.93 billion.

Table 1 TasNetworks forecasts 2015-16 to 2019-20, including likely end of year result for 2014-15

Performance Measure	LEOY 30/06/2015	Forecast 30/06/2016	Forecast 30/06/2017	Forecast 30/06/2018	Forecast 30/06/2019	Forecast 30/06/2020
Profit Before Tax ($m)	149.7	113.7	126.3	93.1	81.6	91.8
Returns to Govt ($m)	157.6	179.9	123.8	129.1	100.3	94.0
Net Debt ($m)	1,654	1,805	1,867	1,910	1,926	1,925
Total Equity ($m)	976	920	949	991	1,048	1,121
Total Assets ($m)	3,270	3,341	3,434	3,531	3,610	3,692
Operating Expenditure ($m)	145.4	138.9	140.1	137.1	133.1	130.5
Capital Expenditure ($m)	149.7	175.4	177.3	181.3	168.9	174.1
Key Financial Ratios						
Return on Assets %	7.1%	6.2%	6.3%	4.9%	4.5%	4.6%
Return on Equity %	10.7%	8.4%	9.5%	6.7%	5.6%	5.9%
Gearing %	62.9%	66.2%	66.3%	65.8%	64.8%	63.2%
FFO interest cover	4.04	3.56	3.46	3.48	3.48	3.70
FFO to total debt	15.6%	13.2%	12.0%	10.6%	10.6%	11.3%
Borrowings ($m)						
Borrowings increase/(decrease)	227.0	151.8	61.2	43.8	15.2	-0.7
Closing Borrowings	1,653.8	1,805.7	1,866.9	1,910.7	1,925.9	1,925.2

The general trend is for declining profit and returns to Government over the planning period. Profit before tax is expected to increase in 2016-17 mainly due to lower depreciation. Returns to Government are higher in 2015-16 as they include equity returns of $50 million. Returns to Government are based on an increasing dividend payout ratio over the planning period in line with Treasury's dividend policy.

3 *From TasNetworks Corporate Plan 2015–16*

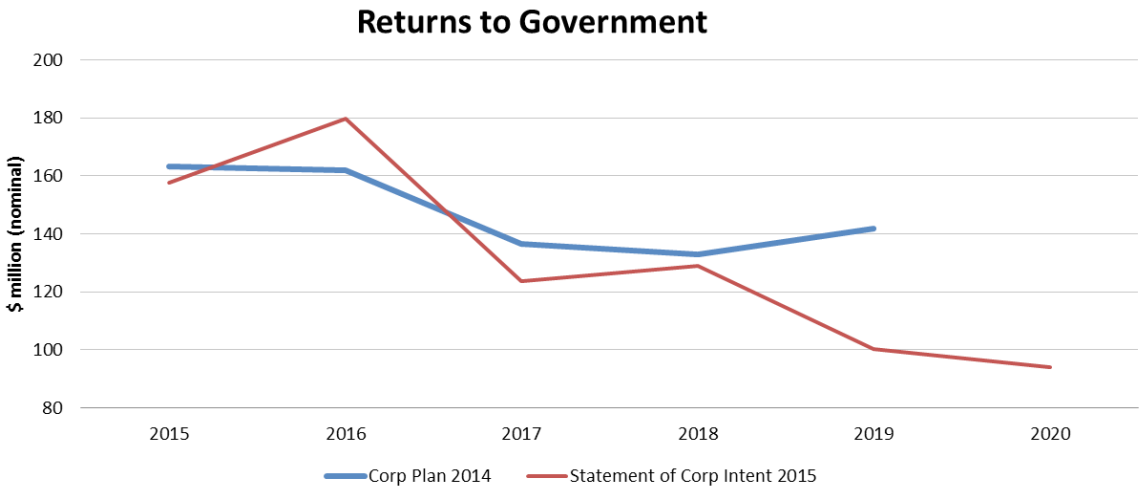
3.10.6 Returns to Government

Figure 8 below[4] shows lower returns to Government in future years that are driven by:

- Lower regulated revenue (lower WACC and expenditure savings which reduce future revenue);
- Impact of debt transfer (higher debt and finance charges); offset partially by lower operational expenditure ($21 million savings achieved from merger so far); and
- Higher dividend payout ratio assumed in line with shareholder dividend guidelines: 60 per cent in 2015-16, increasing to 80 per cent in 2016-17 and 90 per cent in 2017-18 onwards.

Our performance measures and targets represent our present assessment of improved future performance. As we gain more information we will continue to assess and refine our targets. We recognise that it may not always be appropriate to improve performance above target if there is not sufficient benefit to our customers.

Figure 8 Returns to government – forecast compared to prior year



Returns to Government ($m)	2015	2016	2017	2018	2019	2020
Corp Plan 2014	163.3	161.9	136.5	132.9	141.9	
Statement of Corp Intent 2015	157.6	179.9	123.8	129.1	100.3	94.0

3.10.7 Financial Forecast Summary

Our financial projections forecast lower shareholder returns over the period compared to prior year Corporate Plan estimates.

Key issues impacting the financial forecasts are as follows:

- There has been a significant drop in our actual and forecast regulated rate of return, which is attributed to declining interest rates. The lower interest rates have driven a lower than expected WACC return on our regulated asset base (RAB);
- Lower average operational and capital expenditure forecasts for future years;
- To respond to the changing environment and revenue pressures the business is targeting an additional five per cent reduction, over savings already achieved in operational expenditure, in both 2017-18 and 2019-20;
- Capital expenditure forecasts are aligned to the latest forward work programs;
- A total of $395 million in debt transfers will have been assumed by TasNetworks between inception on 1 July 2014 and 2016-17. Borrowings increase from $1.5 billion to a peak of $1.83 billion in 2019-20. This additional debt will also result in higher borrowing costs of $12 to 14 million per annum. Despite the additional debt, TasNetworks' key financial indicators remain robust;
- Increased dividend payout ratio in line with the shareholders' revised dividend guidelines, increasing to 90 per cent of net profits from 2017-18 onwards;
- The increased dividend ratio together with declining future revenue forecasts will impact on our ability to invest in the business and pay down debt levels in the immediate future; and
- Current projections indicate that the business will be borrowing to fund operations but at modest amounts. The business will monitor the sustainability of the 90 per cent dividend payout ratio post 2017-18 in the context of retaining the target "A" credit rating.

4 *From TasNetworks Corporate Plan 2015–16*

3.11 Asset Management Information System

This section is to be read in conjunction with section 11.8.1.

The TasNetworks Asset Management Information System (AMIS) is a combination of people, processes, information and technology applied to provide the essential outputs for effective asset management. These outputs include: reduced risk, enhanced performance, enhanced compliance, effective knowledge management, effective resource utilisation and optimum infrastructure investment.

AMIS is a tool that interlinks asset management processes through the entire network asset life-cycle (see Figure 18).

3.11.1 AMIS Objectives

The key objectives of the AMIS are to assist the business in sustaining and improving, where needed, overall performance of the transmission and distribution networks, in order that the organisational and AM objectives are achieved, by undertaking the following activities:

- Ensuring holistic asset information is collected, maintained and readily accessible to support evidence-based asset management decision making;
- Enhancing the visibility of, accessibility to and trust in asset information across the business; and
- Developing effective AMIS improvement practices that support the life cycle asset management business functions in accordance with ISO55000:2014 and the IIM manual[5] 2011.

Subsequently, addressing these is expected to result in significant improvements across the following aspects:

- Enhance network performance;
- Reduce asset related risk;
- Improve asset knowledge management;
- Enhance regulatory compliance;
- Optimise resource use; and
- Optimise infrastructure investment.

Successfully achieving these objectives will enable compliance with the requirements of the Corporate Plan and Asset Management Policy by significantly improving the quality, completeness, integrity and consistency of asset information, systems and processes at all levels.

3.11.2 AMIS Portfolio and Capabilities

Previous AMIS plans (developed by Transend and Aurora) have resulted in significant increases in network asset information holdings across the business. As a consequence the importance of a robust TasNetworks AMIS is highlighted, to efficiently and effectively manage this network asset information holding.

On the back of these plans, the following outcomes will be delivered:

- Development of a single, life-cycle based, total Asset Management System to manage the long-term capital and maintenance work programs for network assets including the ability to review and compare baseline plans;
- Further development of a number of asset information and related standards and systems, refer to the AMIS Improvement Program of work;
- Further development of an integrated asset performance reporting system using an integrated Business Intelligence reporting framework;
- Further development of an integrated Condition Based Risk Management (CBRM) System to provide TasNetworks with an industry leading approach to asset renewal decisions; and
- Further improvements to the asset commissioning and decommissioning process; specifically updating and maintaining the Asset Register.

The AMIS business process portfolio is being progressively expanded and it is intended that these be reviewed in the new AMIS Improvement Program.

3.11.3 Future Strategies for AMIS

Future strategies to manage the AMIS include, but are not limited to:

- Embed the current systems, tools, applications and processes across the business to enable their full utilisation;
- Develop and extend asset information management and analysis capabilities across the business to enable effective evidence-based decision making;
- Manage the ERP enterprise asset management (Ajilis) implementation to ensure core network asset and works management functions continue to support business asset management operations;
- Continue to work closely with the business to understand emerging and future asset management requirements and ensuring sound governance over AMIS development and utilisation; and
- Data management strategy to address remaining asset information holdings and to allow expansion of the CBRM system.

5 *International Infrastructure Management Manual, Version 4.0, 2011*

Chapter 4

The Tasmanian Power System

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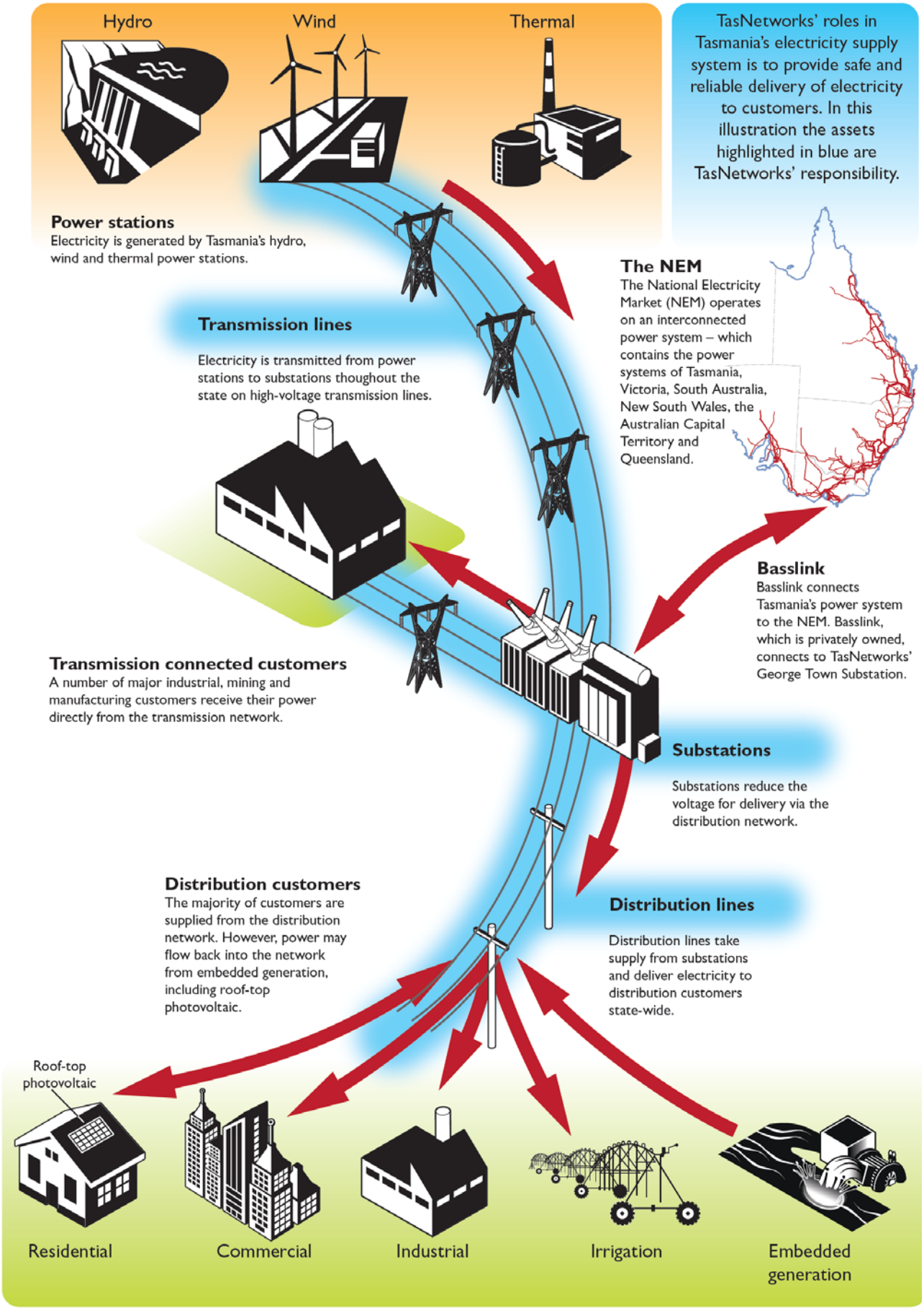
4.1 Overview

The Tasmanian power system comprises:

- Power stations and wind farms that generate large-scale electricity;
- An extra-high-voltage transmission network that transmits electricity from generators to the distribution network and large industrial and mining customers, and permits electricity exchange with mainland Australia through Basslink;
- A distribution network that supplies industrial, commercial, irrigation and residential electricity customers;
- Embedded generation, which is small-scale generation connected typically by private customers, within the distribution network;
- Retailers that provide energy services to customers; and
- End use consumers of electricity.

The Tasmanian power system is shown pictorially in Figure 9, and our area of responsibility within the power system is as highlighted in blue.

Figure 9 Tasmania's power system



4.2 Transmission Network

4.2.1 Transmission Network Overview

We are responsible for transmission network services on mainland Tasmania, and this is provided through the Tasmanian transmission network.

The Tasmanian transmission network comprises:

- A 220 kV bulk transmission network that provides corridors for transferring power from several major generation centres to major load centres and Basslink;
- A peripheral 110 kV transmission network that connects smaller load centres and generators to the bulk transmission network, and provides some support to the above bulk transmission network; and
- Substations at which the lower voltage distribution network, and large industrial loads, are connected to the 110 kV or 220 kV transmission network.

Most loads are concentrated in the north and south-east of the state. Bulk 220 kV supply points are located at Burnie and Sheffield (supplying the north-west coast), George Town, Hadspen (supplying Launceston and the north-east), and Chapel Street and Lindisfarne (supplying Hobart and the south-east) substations. Smaller load centres are supplied via the 110 kV peripheral transmission network.

Substations in the Tasmanian transmission network transform voltages between transmission voltages, between transmission and distribution voltages, or both. Our substations also connect generators to the transmission network, provide network switching, and provide supply to those customers connected directly to the transmission network. Connection points between our transmission and distribution networks are provided at 43 substations. These are known as terminal substations and supply the distribution network at 44, 33, 22, 11 and 6.6 kV. Switching stations provide network switching capabilities, allowing the transfer of power throughout the transmission network. Some switching stations also connect generation to the network.

Table 2 provides a summary of key parameters of our transmission network infrastructure.

Figure 10 shows the geographical layout of the Tasmanian transmission network along with our planning areas.

4.2.2 Generation Customers

There are currently five generating companies which have power stations connected to the Tasmanian transmission network:

- AETV Pty Ltd;
- Hydro Tasmania Pty Ltd;
- Musselroe Wind Farm Pty Ltd;
- Woolnorth Bluff Point Wind Farm Pty Ltd; and
- Woolnorth Studland Bay Wind Farm Pty Ltd.

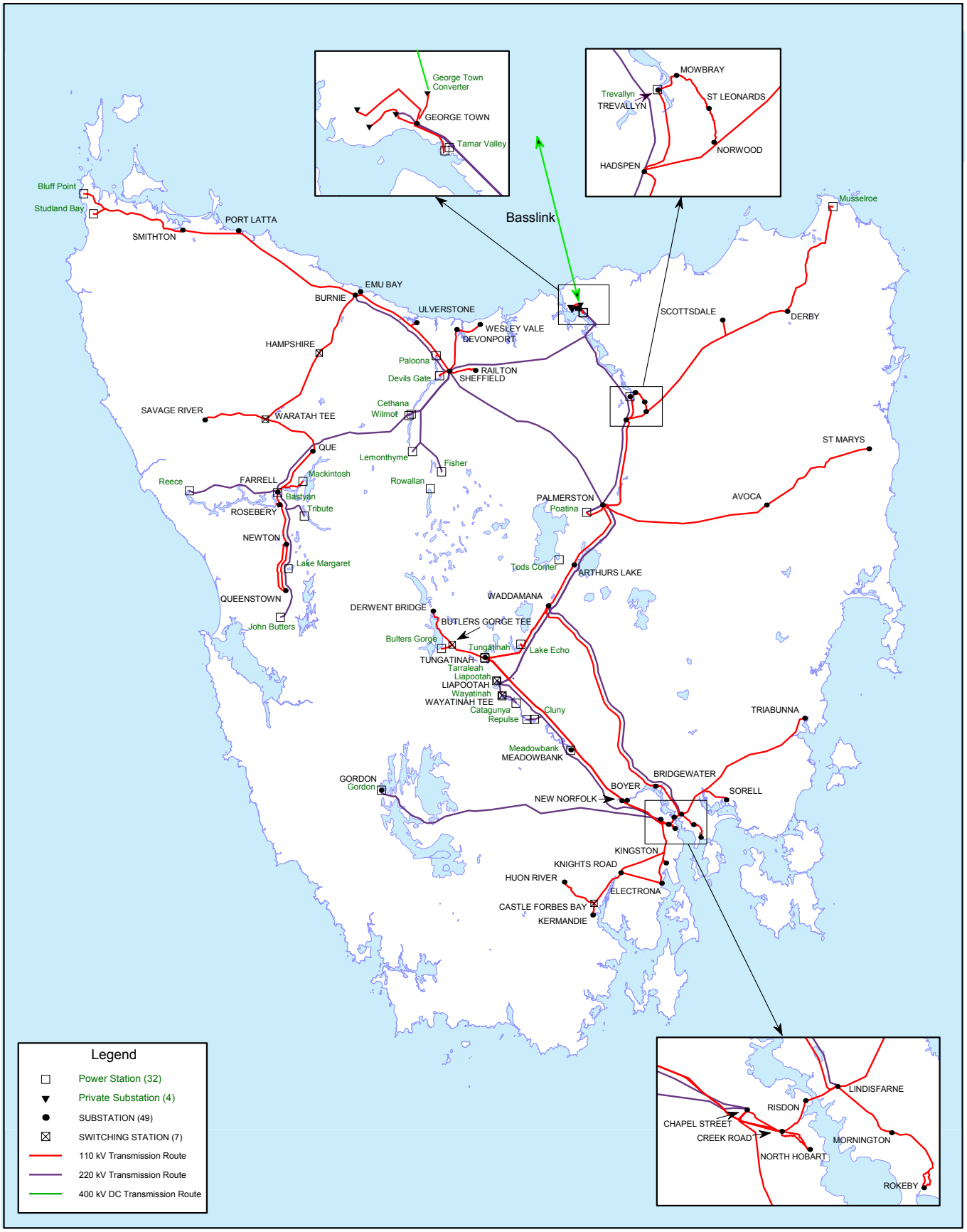
Mainland generators also supply energy to the Tasmanian transmission network via Basslink. A number of other small generators that are connected within the distribution network, termed embedded generators, are also licensed to operate in Tasmania. Very small embedded generators, such as roof-top photovoltaic systems, do not require a generating licence but must still have a connection agreement with TasNetworks.

All large generators sell electricity to a central market: the NEM. AEMO coordinates the dispatch of generators so that the power supplied into the network, at any instant, matches the total being consumed. The interconnected nature of the NEM allows electricity to flow across state borders, which means electricity can be sourced from whichever generators can supply it at the lowest cost.

Table 2 Transmission network infrastructure

Asset	Quantity
Substations	43
Switching stations	6
Circuit kilometres of transmission lines	3,554
Route kilometres of transmission lines	2,344
Circuit kilometres of transmission cable	24
Transmission line support structures (towers and poles)	7,621
Easement area (Ha)	11,176

Figure 10 Tasmania's electricity transmission network



4.3 Basslink

Basslink Pty Ltd is a Market Network Service Provider (MNSP) in the NEM. Basslink Pty Ltd owns, operates and maintains the Basslink interconnector, a High Voltage Direct Current (HVDC) electrical interconnector between Victoria and Tasmania.

Basslink has a continuous sending end capacity of 500 MW and a short term sending end capacity of 630 MW when exporting electricity from Tasmania to Victoria. Power flow into Tasmania is limited to 478 MW. These figures are maximum limits. Basslink has a non-operational zone between 50 MW export and 50 MW import at all times.

Basslink is also able to transfer frequency control ancillary services (**FCAS**) between the mainland and Tasmania.

4.4 Distribution Network

4.4.1 Distribution Network Overview

We are responsible for the distribution of electricity to homes and businesses on mainland Tasmania and Bruny Island.[6]

The Tasmanian distribution network provides supply to over 280,000 customers and comprises:

- A sub-transmission network in greater Hobart, including Kingston, and one sub-transmission feeder on the west coast of Tasmania that provide connection points for the high voltage network in addition to terminal substations;
- A high voltage network of feeders[7] that distribute electricity from terminal and zone substations to the low voltage network and a small number of customers connected directly to the high voltage network; and
- Distribution substations and low voltage feeders providing supply to the majority of customers in Tasmania.

Feeders are classified as supplying rural and urban areas, and tend to have the following differing characteristics.

1. Rural areas generally have low load, low customer connection density, and smaller rural population centres that are remote from supply points. Feeder supplying rural areas tend to cover wide geographic areas and can have a total route length between 50 km and 500 km. The significant route length creates a high exposure to external influences such as storm damage and lightning strikes. Additionally, rural feeders are generally radial in nature, with limited ability to interconnect with adjacent feeders. These two characteristics tend to result in more frequent and longer duration interruptions to supply. The majority of feeders supplying rural areas are operated at 22 kV. Rural areas supplied at 11 kV are generally those on the outer areas surrounding greater Hobart and Kingston. Planning issues on feeders supplying rural areas are characterised by voltage and power quality issues which is due to the feeder length and disturbing loads e.g. pumping load.
2. Urban areas have high load and customer connection density. Feeders supplying urban areas are generally much shorter than rural feeders. They tend to have more underground reticulation, and more interconnections with other urban feeders. Consequently, restoration following interruptions to supply is usually quicker than in rural areas. Feeders supplying urban areas of greater Hobart, Kingston and a pocket of the Burnie commercial area, are operated at 11 kV. Those in Launceston, Devonport and Burnie are operated at 22 kV. Feeders supplying urban areas are generally capacity constrained and have issues with high fault level.

---

6 The provision of electricity supplies on the Bass Strait Islands is managed by Hydro Tasmania.

7 The term 'feeder' is the common name used to describe distribution lines.

Table 3 Distribution network infrastructure

Infrastructure	Nominal Voltage (kV)	Quantity
Connection Points		
Sites	44, 33, 22, 11 and 6.6	45
Sub-transmission feeders	44, 33 and 22	26
Minor zone source feeders[8]	22 and 11	6
Distribution feeders	22, 11 and 6.6	240
Zone Substations		
Major	44, 33 and 22	13
Zone distribution feeders	22 and 11	117
Minor	22 and 11	3
Zone distribution feeders	22 and 11	7
Distribution Substations		
Overhead		29,738
Ground-mounted		1,901
Route Data[9]		
High voltage overhead	6.6 to 44	15,125 km
High voltage underground	6.6 to 44	1,222 km
Low voltage overhead[10]	0.4	4,959 km
Low voltage underground	0.4	1,235 km
Poles	All voltages	221,405

Table 3 provides a summary of key parameters of our distribution network infrastructure.

8 Includes minor zone alternate-supply feeders

9 Includes TasNetworks owned assets only

10 Excludes customer service lines

Figure 11 Tasmania's electricity distribution network

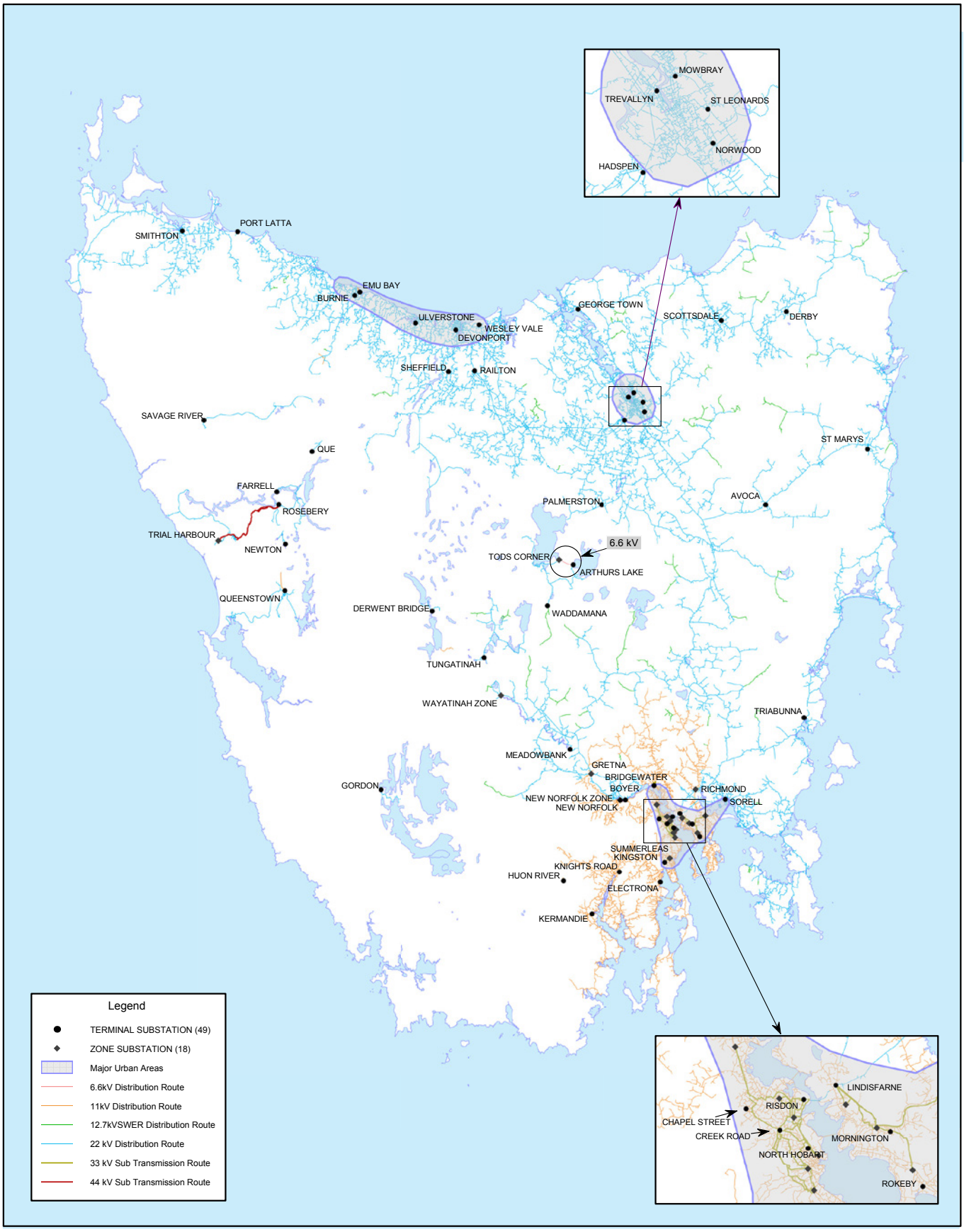


Figure 11 above presents a geographical overview of the high-voltage distribution network by voltage, supplying rural and urban areas.

4.5 Telecommunications Network

We also provide a telecommunications network service within Tasmania. The telecommunications network supports operation of the electricity network interfacing protection, control and data, telephone handsets and mobile radio transceivers. It also serves customers in the electricity supply industry and is utilised by other parties under commercial agreements. The telecommunications assets comprise: communications rooms and associated ancillary equipment within substations and administrative buildings, optical fibre on transmission and distribution lines, digital microwave radios and associated repeater stations, and some power line carrier equipment.

In support of our telecommunications network, a number of telecommunications circuits are provided via Telstra's network which are generally outside our network's coverage area. All interstate services are provided by Telstra.

4.6 How are we different

The Tasmanian electricity system has the following features which make it unique in the NEM.

4.6.1 Small load

Tasmania's median load during 2014 was approximately 1140 MW. The largest generating system in Tasmania which connects via a single transmission line is rated at 168 MW, and there are five more generating units which are effectively rated at 144 MW each. These generators each have the capacity to supply a much larger portion of the state's load compared with the largest generating units in other NEM states. This gives rise to larger frequency deviations in Tasmania than occur in mainland NEM regions. Consequently, Tasmania's Frequency Operating Standards differ from those of the mainland. The technical implications of this are discussed in the Annual Planning Report.

4.6.2 Customer load base

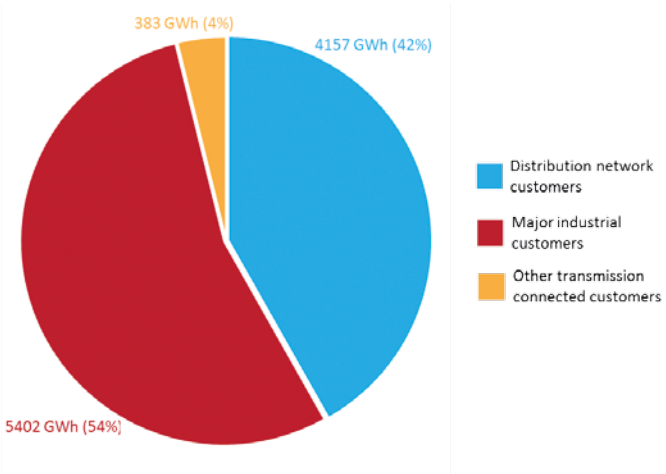
The majority of the electrical energy consumed in Tasmania is by the large customers directly connected to the transmission network. We have 11 load customers who are directly connected to the transmission network. Collectively they consumed approximately 58 per cent of the electrical energy in Tasmania and contributed to approximately 44 per cent of the state-wide peak demand in 2014. Of these 11, four are major industrial customers which themselves consumed 54 per cent of the energy. Figure 12 presents the relative energy consumption in 2014 supplied from the transmission network.

4.6.3 Hydro generation dominated

Figure 13 shows the relative composition of Tasmania's generator fleet. Power generation is dominated by hydro generating units, which are dispersed throughout Tasmania. The dominance and geographic diversity of hydro generation has the following impacts:

- Hydro generating units are much slower to respond to frequency deviations than steam generating units. This compounds the frequency deviation impacts caused by the high generator size to system load ratio. Providing sufficient frequency control ancillary services can be problematic in Tasmania;
- The geographic dispersion of a large number of smaller sized generating units means that relatively more transmission infrastructure, per MW generated, is required compared with other states; and
- Tasmania's electricity network has traditionally been energy constrained not capacity constrained. That is, there is always sufficient generation capacity available to meet short term load peaks, but sustained low rainfall can give rise to difficulties in meeting the state's long-term electric energy needs. The existence of Tamar Valley Power Station (natural gas fuelled), three wind farms and Basslink has alleviated the energy constraints in recent years.

Figure 12 Energy consumption supplied from the transmission network in 2014



4.6.4 Windy location

Tasmania is an inherently windy state, being located in the Roaring Forties latitudes. There is sufficient wind resource to suggest an expansion of wind generation in the state is possible. This needs to be balanced however against the technical difficulties associated with integrating wind generators into a small power system with the characteristics described above.

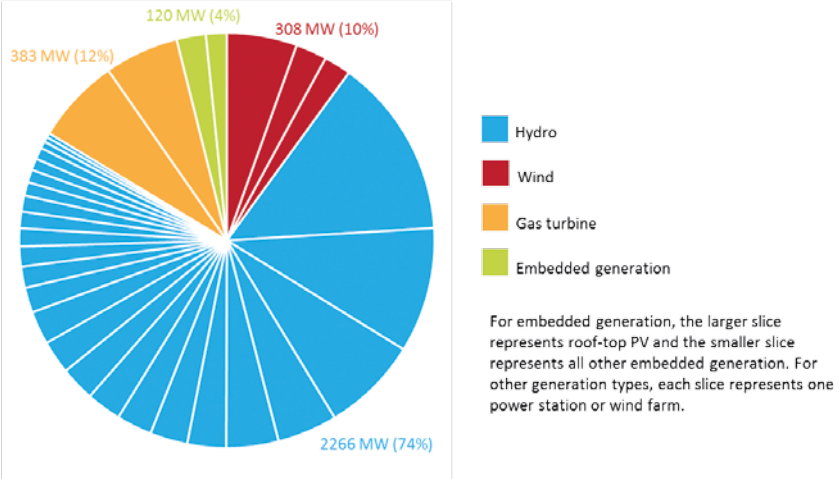
4.6.5 Single non-regulated interconnector to other NEM regions

Tasmania's only connection to the remainder of the NEM is via Basslink, a privately owned HVDC market network service provider. This contrasts with mainland NEM regions, which are all interconnected via regulated interconnectors. Further details of Basslink are provided in Section 4.3.

4.6.6 Single regulated transmission and distribution network service provider

TasNetworks is the only provider of transmission and distribution network services in the state, as outlined in section 1.4. This integrated level of service provision is unique in the NEM.

Figure 13 Generation capacity by type



Chapter 5

Organisational Roles and Responsibilities

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5.2 Organisational Structure 34

5.1 Overview

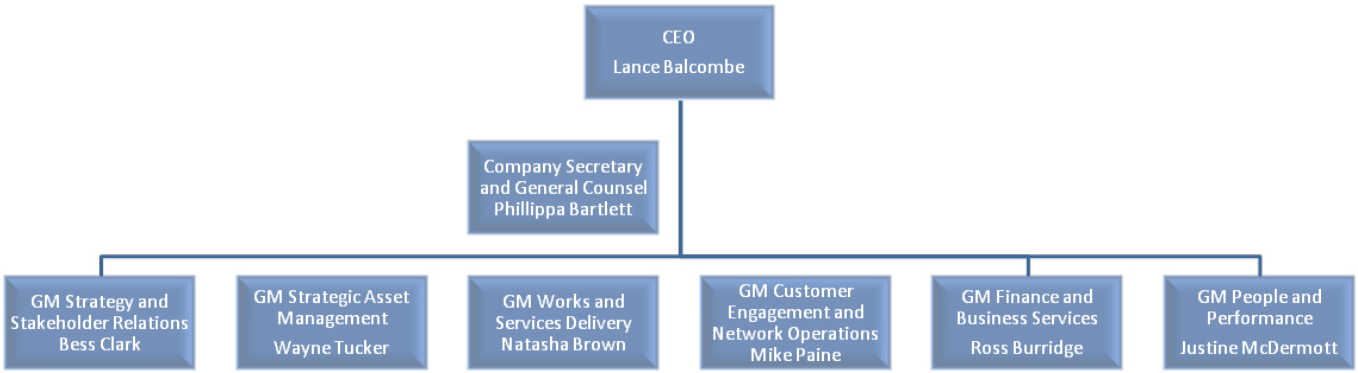
This chapter discusses the organisational management structure and their roles and responsibilities.

5.2 Organisational Structure

Figure 14 shows the organisational management structure of TasNetworks.

The organisational structure of TasNetworks is based around seven groups, with their responsibilities being as follows:

Figure 14 Management structure



1. Company Secretary and General Counsel

The Company Secretary and General Counsel has responsibility for Board and corporate governance, legal services and wayleaves.

2. Strategy and Stakeholder Relations

Strategy and Stakeholder Relations is responsible for corporate strategy, business performance, strategic risk, economic regulation, pricing strategy and frameworks, market reform activities, external and internal communications, brand strategy, government and shareholder relations, and stakeholder engagement.

3. Strategic Asset Management

Strategic Asset Management is responsible for asset strategy and planning, network analysis and planning, operational and power system technology, network innovation and demand side and other new technologies.

4. Works and Service Delivery

Works and Service Delivery is responsible for asset stewardship, including design and estimation, works program management and reporting, project and program works delivery, contract management, field operations, works schedule and dispatch, safety and environment policy, strategy and implementation, the TasNetworks Training Centre, and quality accreditation processes.

5. Customer Engagement and Network Operations

Customer Engagement and Network Operations is responsible for network operations and the Control Centre, network access management, large customer and market relationships, retailer management, the Customer Contact Centre, connection point management and charging, meter data management and publishing, billing enquiries and dispute resolution, and telecommunications asset, network and customer management.

6. Finance and Business Services

Finance and Business Services is responsible for treasury, corporate modelling, financial reporting, risk management and insurance, procurement, fleet, property and facilities, accounts payable and receivable, audit, corporate IT and information management.

7. People and Performance

People and Performance is responsible for human resources strategy, change management, human resources policies (excluding health, safety and environment), industrial relations, recruitment, performance management systems, learning and development, advice and support, and payroll and timekeeping.

Chapter 6

Leadership and Culture

6.1 Overview 36

6.2 Training and Developing our People 36

6.1 Overview

This chapter shows how we are building a high performance culture and high levels of employee engagement to support achievement of our business objectives and enable us to be sustainable. As leader behaviour is known to drive culture, we are investing in the development of our leaders at all levels to build self-awareness and leadership capability, focusing on communication, teamwork, business improvement and change.

We offer leadership development through the following programs and initiatives:

- TasNetworks' Leadership Team development program (Levels 1 and 2);
- Switched on Leaders Program (Level 3);
- Empowering Leaders Program for frontline leaders (see section 6.2.1 below);
- Team development workshops with discrete leadership teams; and
- Quarterly leader forums.

The capacity of TasNetworks to implement the asset management strategy discussed in this document will rely on the continued leadership, commitment and involvement of TasNetworks management and staff. Leadership will form the major influence in the development and application of this strategy together with the strategic and operational continuous improvement plans.

To ensure success and a positive change in TasNetworks asset management practices, leadership will be paramount across the entire organisation. The CEO, the leadership team and all leaders aim to champion TasNetworks ongoing commitment to sustainable asset management in their actions and messages to staff, as well as effective mentoring.

6.2 Training and Developing our People

We invest approximately $4 million per annum in training and developing our people across the whole business in a range of ways. Our Mornington Training School delivers a range of important development opportunities for our field based people, including safety and first aid training and live line training. All of our people participate in achievement and development planning and the planned development program is implemented each year.

6.2.1 Leadership Development

We are establishing a number of initiatives to support the development of the TasNetworks culture through leadership. The Empowering Leaders Program is one of these initiatives aimed at supporting leadership development.

The purpose of the program is to provide participants with a greater understanding of the business, their role as a TasNetworks leader and themselves, as well as equipping them with core leadership skills. The program has been developed with input from across the business and subject matter experts are supporting the program through presentations and participation to facilitate sharing. The inaugural intake of this program is 35 of our people from all areas of the business.

6.2.2 Culture Change

We measure the impact of leadership development and associated culture change through a biennial culture survey. The first survey was run in December 2014 using the Organisational Culture Inventory. The outcomes of the survey define TasNetworks current culture, identify opportunities for improvement, and establish a baseline to measure the impact of improvement activities.

Chapter 7

Risk Management

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7.2 Risk management framework 39
7.3 Operational risk management 40
7.4 Asset condition and risk 40

7.1 Overview

The effective management of risk is central to the core business and efficient management of TasNetworks. Our approach to risk management involves managing to achieve an appropriate balance between realising opportunities for gains while minimising adverse impacts. Risk management is viewed as an integral part of good management practice and an essential element of good corporate governance.

An integral part of how TasNetworks operates is the identification and treatment of risk, so all our stakeholders prosper. Our ability to deliver electricity and telecommunications network services and create value for our customers, owners and our community is significantly influenced by the effectiveness of our management of risk. We aim for risk management to become part of the culture, embedded into our operating philosophy, business practices and processes.

The Risk Management Policy is the overarching document that provides guidance on risk management practices. It is a high-level document that clearly establishes expectations in relation to risk management. The responsibilities, structures and processes established to ensure TasNetworks achieves its risk management objectives are detailed within the Risk Management Framework.

7.2 Risk management framework

The risk management framework sets out our management of the effects that uncertainty has on achieving our vision and strategic objectives. The framework also facilitates compliance with legislation, rules, codes, guidelines and various industry standards.

Figure 15 Risk Management Framework

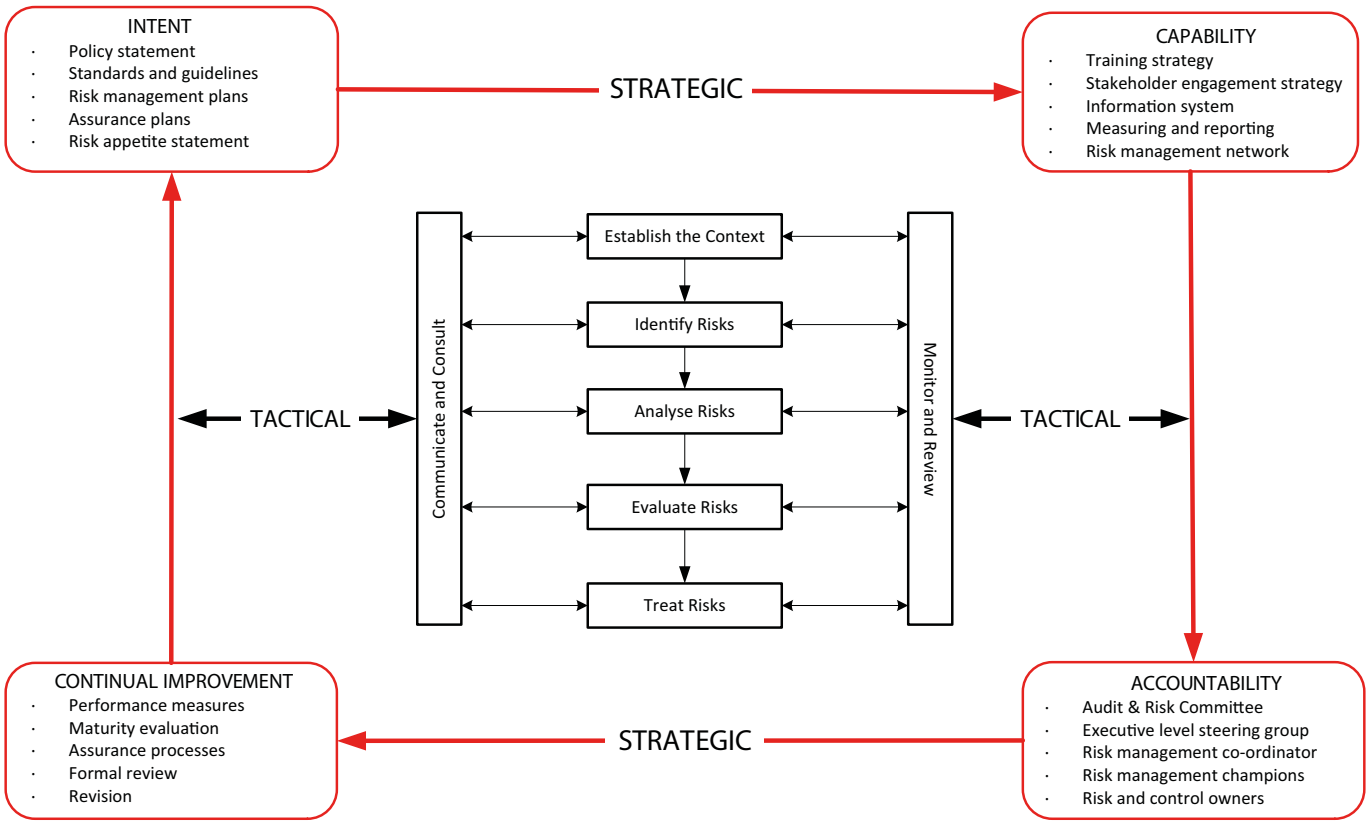

Figure 15 shows the risk management framework with both its strategic and tactical (operational) components.

7.3 Operational risk management

In accordance with AS/NZS ISO31000:2009 Risk management – Principles and guidelines, Figure 16 shows the operational process undertaken by TasNetworks when managing risk.

7.4 Asset condition and risk

Some of our assets are older than those of our network peers, and a key focus for us is to manage the associated asset risk due to poor condition effectively to achieve our asset management service and cost performance objectives.

With regard to asset condition and risk, we will continue to set service-based targets for assets to balance the risk of asset failure and the associated reliability impacts with cost.

We are also pursuing strategies to:

1. expand the use of condition based risk management across key asset categories; and
2. continue to develop and implement processes for capturing, registering, assessing, and tracking asset related risks and associated risk controls and treatments to better match service performance with our customer requirements. For further information refer to section 3.11.

Table 4 provides an overview as to which management techniques are applied by TasNetworks in managing the risks of each asset category in our asset base.

Figure 16 Risk Management Operational Process

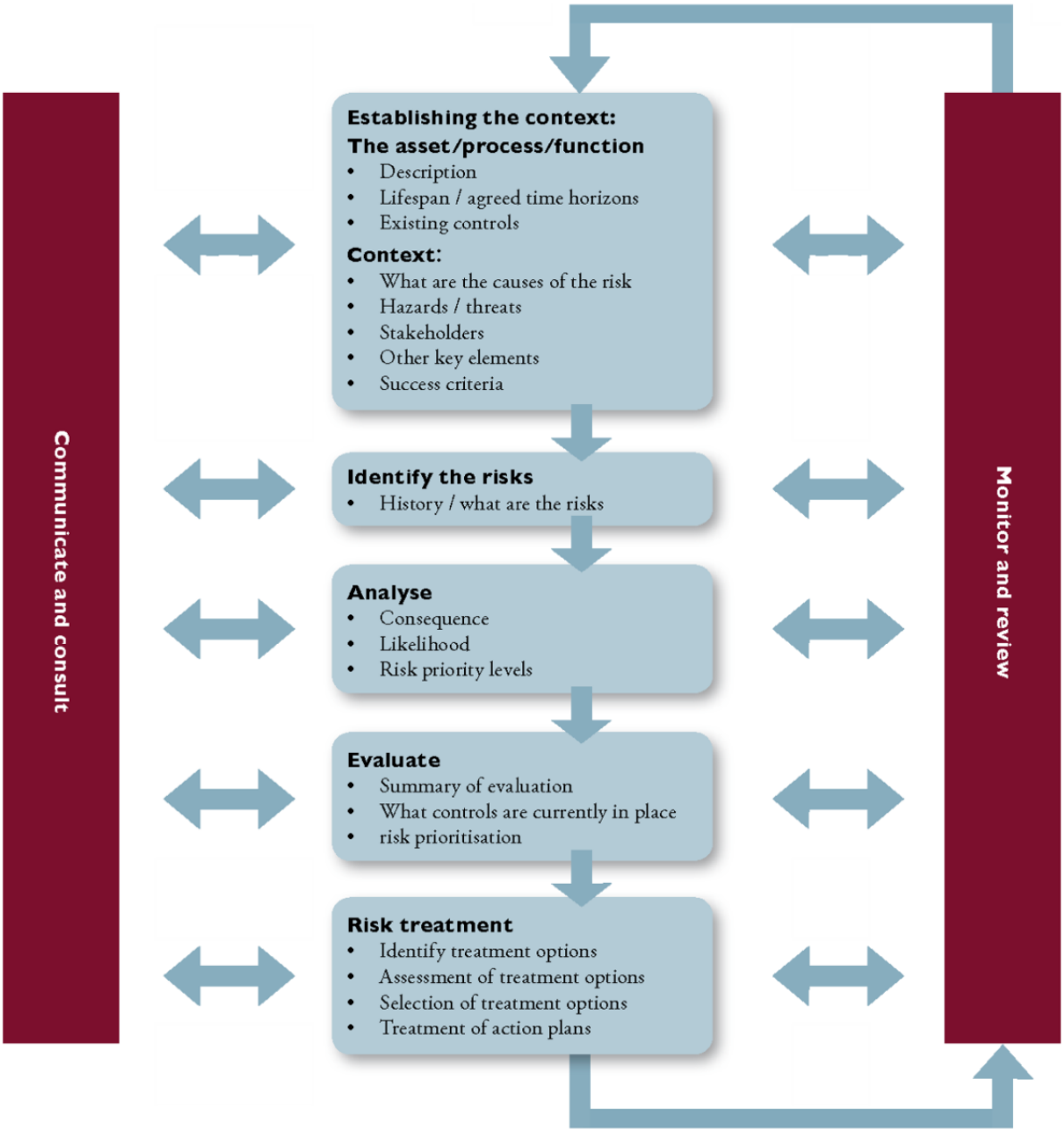

Table 4 TasNetworks asset category management overview

How are assets managed?																							
Assets	**Past**							**Present**							**Future**								
	Run to failure	**Subject Matter Expert (SME)**	**Time based (Age)**	**Reliability centered maintenance (RCM)**	**Condition based**	**CBRM**		**Run to failure**	**Subject Matter Expert (SME)**	**Time based (Age)**	**Reliability centered maintenance (RCM)**	**Condition based**	**CBRM**		**Run to failure**	**Subject Matter Expert (SME)**	**Time based (Age)**	**Reliability centered maintenance (RCM)**	**Condition based**	**CBRM**	
Distribution Assets																							
Overhead lines																							
Structures		✓			✓						✓	✓						✓	✓	✓			
Conductors		✓			✓					✓	✓	✓						✓	✓	✓			
Switchgear	✓	✓			✓			✓			✓	✓						✓	✓				
Transformers	✓	✓			✓			✓			✓	✓			✓			✓	✓				
Vegetation		✓			✓						✓	✓						✓	✓				
Protection & Control																							
Zone sub protection relays		✓			✓							✓							✓				
Zone sub DC systems		✓			✓							✓							✓				
Zone sub SCADA		✓			✓							✓							✓				
Distribution sub relays		✓			✓							✓							✓				
Distribution DC systems	✓	✓								✓							✓						
Distribution sub ancillary	✓	✓						✓											✓				
Recloser protection	✓	✓						✓											✓				
Recloser DC systems	✓	✓								✓							✓						
Fault indicators	✓									✓							✓						
Regulators	✓											✓							✓				
Zone substations																							
Site		✓	✓						✓	✓						✓	✓						
Transformers		✓	✓		✓				✓	✓		✓				✓	✓		✓	✓			
Switchgear		✓	✓		✓				✓	✓		✓				✓	✓		✓	✓			
Dist Substations																							
Site		✓	✓						✓	✓						✓	✓						
Transformers	✓	✓	✓		✓			✓	✓	✓		✓			✓	✓	✓		✓				
Switchgear		✓	✓		✓				✓	✓		✓				✓	✓		✓				
UG Network																							
Cables - LV	✓				✓			✓							✓				✓				
Cables - HV	✓				✓			✓							✓				✓				
Cables - 33kV		✓	✓		✓				✓	✓						✓	✓		✓				
Furniture	✓				✓			✓							✓				✓				
HV Regulators																							
Site		✓	✓		✓				✓	✓		✓				✓	✓		✓				
Regulators		✓	✓		✓				✓	✓		✓				✓	✓		✓	✓			
Transmission Assets																							
Communications																							
Radio Bearers		✓			✓							✓								✓			
Optical Fibre Bearers		✓			✓							✓								✓			
Multiplexers		✓			✓							✓								✓			
Prog Logic Controllers		✓			✓							✓								✓			
Ethernet Devices		✓			✓							✓								✓			
Server Infrastructure		✓			✓							✓								✓			
Telephony Hardware		✓			✓							✓								✓			
Rectifiers		✓			✓							✓								✓			
Batteries		✓			✓					✓		✓					✓			✓			
Civil Infrastructure		✓			✓							✓								✓			
Protection & Control																							
Busbar		✓	✓										✓							✓			
Feeder		✓	✓										✓							✓			
Transmission line		✓	✓										✓							✓			
Transformer		✓	✓										✓							✓			
Capacitor Bank		✓	✓										✓							✓			
SCADA		✓	✓										✓							✓			
Substations																							
Transformers (power)			✓							✓ (maintenance)		✓	✓ (renewed)				✓			✓			
EHV circuit breakers			✓							✓ (maintenance)			✓ (renewed)				✓			✓			
HV circuit breakers			✓							✓ (maintenance)			✓ (renewed)				✓			✓			
EHV Disconnectors & Earth switches			✓							✓ (maintenance)			✓ (renewed)				✓			✓			
EHV CT's			✓							✓ (maintenance)			✓ (renewed)						✓	✓			
EHV VT's			✓							✓ (maintenance)			✓ (renewed)						✓	✓			
Power cables			✓							✓ (maintenance)		✓	✓ (renewed)						✓	✓			
Site infrastructure					✓							✓							✓	✓			
Transmission lines																							
Towers					✓							✓								✓			
Conductor assemblies					✓							✓								✓			
Insulator assemblies					✓							✓								✓			
Foundations					✓							✓	✓							✓			
Easements					✓							✓								✓			

Chapter 8

Future Demand Requirements

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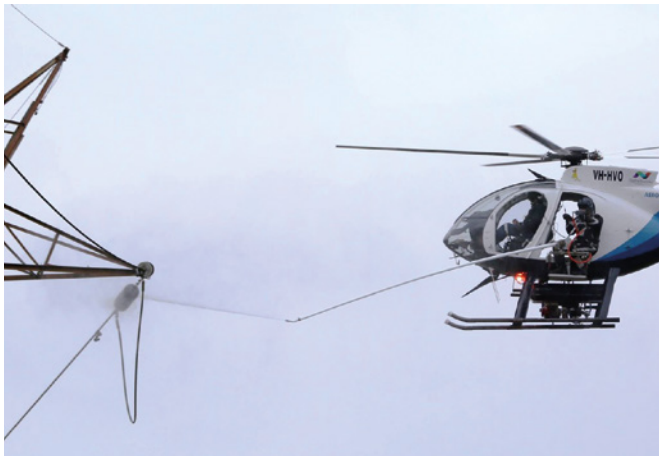
8.1 Tasmanian Energy Forecast

Figure 17 below present's Tasmanian historic electricity energy sales data from 2005 to 2014 and the Tasmanian electrical energy sales forecast from 2015 to 2025 for the medium, high and low growth scenarios. All values are in financial years and the year indicated in the figure is the financial year ending 30 June.

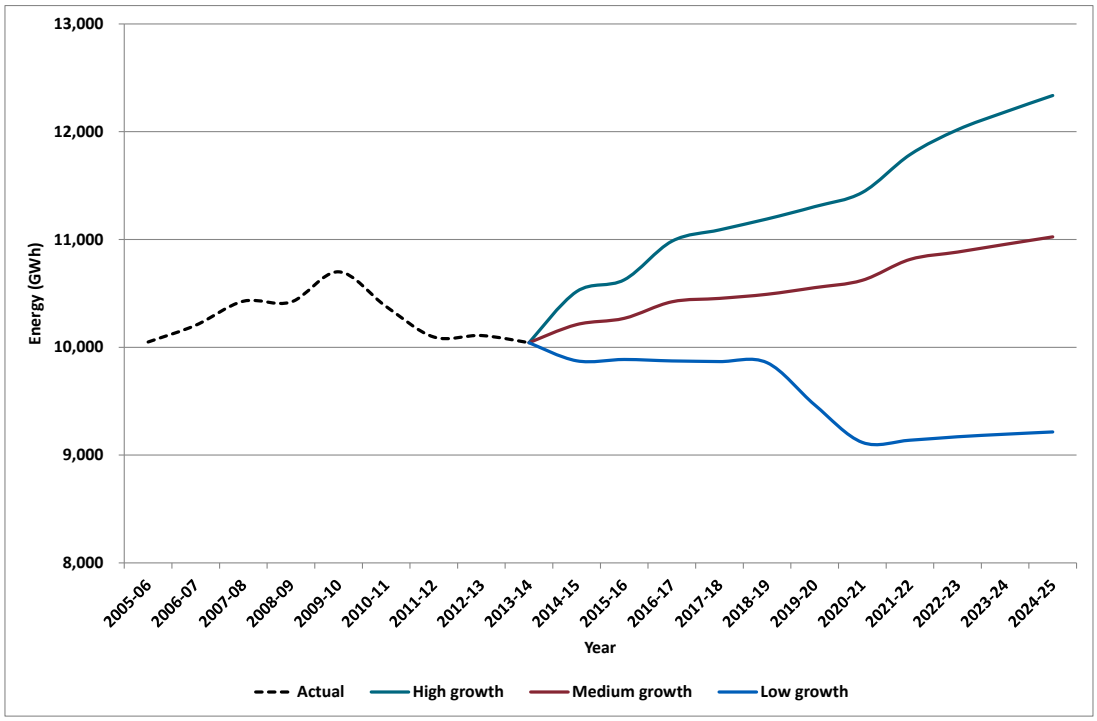
The medium growth forecast for the total Tasmanian energy sales from 2015 to 2025 indicates an average growth of 0.77 per cent per annum. This is similar to the forecast growth rate in the 2014 Annual Planning Report (APR). This growth rate is slightly higher than AEMO forecast for the NEM, i.e. 0.54 per cent per annum. The medium growth forecast assumes no change to the number of directly connected transmission customers.

The annual growth for the low scenario is an average of – 0.69 per cent from 2015 to 2025. This scenario assumes an ongoing downturn in the state economy and some loss of industrial load.



The annual growth for the high scenario is an average of 1.61 per cent from 2015 to 2025. This is based on more favourable economic conditions, including two potential (hypothetical) new major industrial customers connecting to the Tasmanian transmission system.

Figure 17 Forecast of total Tasmanian electrical energy sales



The last few years of historical data indicate a declining trend in energy sales in Tasmania. Factors affecting the forecast include Gross State Product (GSP) growth, electricity price drop, household consumption expenditure increase (due to drop in interest rate and petrol price) and dwelling investment increase. We expect the next few years' energy trend remains within medium and low forecast with an inclination towards the medium forecast.

The reduction in energy use from 2010 to 2012 was influenced by the following events:

- Closure of Australian Paper Mills at Burnie and Devonport in 2010;
- Suspension of operations at Hellyer gold mine in 2011;
- Reduction in demand for three months by TEMCO manganese smelter in 2012;
- Commissioning of an embedded 7.9 MW co-generation plant in 2012;
- Closure of timber mills at Scottsdale and Hampshire in 2012; and
- Increased installations of solar photovoltaic panels (PV) throughout Tasmania.

As per the 2014 actual generation and sales data, annual energy losses (including distribution losses) were 4.2 per cent of the total generation.

Chapter 9

Life-cycle Strategies

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9.1 Overview

This chapter discusses TasNetworks life-cycle approach to asset management and the resulting key asset strategies aimed at achieving our asset management objectives (see section 3.7), and corresponding corporate objectives.

9.2 Life-cycle approach

The goal of infrastructure asset management is to meet a required level of service in the most cost-effective manner, through the prudent and efficient management of assets for present and future customers. The key elements of infrastructure asset management are:

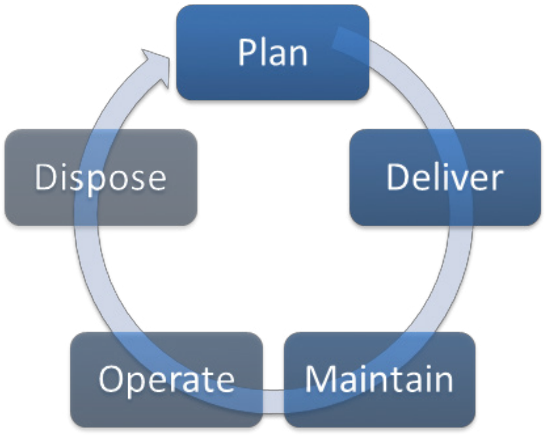
- Adopting a life-cycle approach;
- Developing cost-effective management strategies for the long term;
- Providing a defined and agreed level of service;
- Monitoring performance;
- Understanding and meeting the impact of growth through demand management and infrastructure investment;
- Managing risk associated with asset failures;
- Sustainably using physical resources; and
- Continually improving asset management processes and practices.

Ageing and potentially unreliable assets are managed as part of our overall asset management strategy. The focus of this strategy is to ensure that replacement of assets is determined on asset condition and risk rather than age alone. In developing strategies in relation to potentially unreliable assets we take a holistic approach to asset renewals, augmentations and decommissioning across both transmission and distribution networks. We ensure that our asset management plans align with our development plans to drive the most efficient outcome with a balance between cost, risk and performance.

A formal approach to the management of assets is essential to providing services in the most cost-effective manner. This enhances TasNetworks' ability to demonstrate its approach to asset management to customers and other stakeholders (particularly economic regulators).

Our approach to asset management is centred on asset life-cycle management. There are five stages in the asset life-cycle as shown in Figure 18.

Figure 18 Asset Management Life-cycle



9.3 Life-cycle strategies

Each phase of the life-cycle has a corresponding life-cycle strategy, which describes our approach to the particular activities in that stage, objectives relevant to that stage, and strategies for providing performance to required levels. The five life-cycle strategies (Planning, Delivery, Maintenance, Operations, and Disposal) are summarised below.

- **Planning** covers Capex planning, from need identification, evaluation and approval, through to handover to delivery for implementation;
- **Delivery** covers implementing capital works (including detailed design, procurement, installation, and commissioning) and the dismantling and decommissioning of assets;
- **Maintenance** covers our approach to maintaining assets, including the types of maintenance employed and a discussion of how the work is managed;
- **Operations** covers operation of the assets, including real-time operational control, situational awareness, outage coordination, and contingency planning; and
- **Disposal** covers activities relating to the disposal and divestment of assets and the disposal of waste material.

9.4 Asset strategies and plans

The majority of our asset management activities are managed at an asset category (or asset fleet) level. In some cases a number of asset categories that have common characteristics and functions have been grouped into a single asset category strategy plan. The asset category strategy plans are known as Asset Management Plans (AMPs) and are discussed further in Section 10.1.

9.5 Site strategies

In addition to our asset category based life-cycle approach to asset management, we also develop a number of site based strategies. These are used to integrate and optimise asset category based activities at particular substations, lines, and circuits to assist in developing both short-term and long-term replacement, redevelopment and/or augmentation plans for each site.

9.6 Key asset management strategies

We are continuing to refine our asset management strategies, to prioritise our expenditure to manage risks and ensure that our assets are managed across their life-cycle. The following are a selection of the key asset management strategies.

9.6.1 Innovation Strategy

In recent years we have seen significant changes in the electricity network. Not only is the technology that we use to solve network issues changing, but the network itself is changing. External influences, such as embedded generation and the 'internet of things' has accelerated this change. We now operate in a highly dynamic environment, with customers having more choices than ever before about how to best meet their energy needs.

A number of changes are being made to the National Electricity Rules to enhance customer choice and to support more informed decision making. Because we are revenue-capped, we can only recover the efficient revenue we are allowed by the AER each year. Changes to our network tariffs are to make network pricing more closely linked to customers' use of our network, and the value the network provides each customer.

Within this dynamic environment, we run our network harder, rather than building more, wherever we can do this safely. We have a track record of implementing novel solutions in our transmission network, including dynamic ratings and system protection schemes to defer or avoid costly network investment. We are using this knowledge and skills to address challenges in the distribution network.

We will continue to implement network solutions that provide the lowest sustainable network prices for our customers. We will continue to engage with our customers to ensure that the technologies we deploy are fit for purpose and deliver value.

Technology also creates challenges in planning and operating our network: solar Photovoltaic (PV) is a notable example, with significant increases in the number of installations over the past five years. Installation of medium-sized embedded generation in commercial settings is also increasing.

We are committed to finding innovative, least-cost ways to manage the network in an environment where the number and size of embedded generation installations is increasing, and energy flows, voltages, and customer requirements are changing. Residential battery technology is likely to be the next trend, causing another major shift in the electricity market and network operation.

In addition, use of electric vehicles charged from the distribution network is likely to increase in the coming years. Electric vehicles are an opportunity to further utilise the network and we are currently sponsoring a feasibility study to encourage uptake by Tasmanian car fleet managers. We are considering how to best achieve successful integration of this technology with our network.

We are taking advantage of technology advancements to increase the efficiency of the network. Our forward plans include operating and capital expenditure allowances that will enable us to exploit these opportunities, for the long term benefit of our customers.

9.6.2 Southern Transmission Rationalisation Strategy

The southern transmission system is a critical part of the Tasmanian transmission system in that it:

- Connects 946 MW of installed generation capacity (2013 winter maximum generation was 827 MW);
- Supplies 690 MW of load (2012/13 winter maximum demand) including the greater Hobart area; and
- Forms a critical connection through Waddamana Substation to the northern transmission system, and subsequently to the Victorian region of the National Electricity Market through the Basslink interconnector.

The southern transmission system includes most of the earliest transmission lines of the 110 kV network, which originated from Tarraleah Power Station in 1938. This 110 kV network was constructed as the main grid at the time to support the existing 88 kV network from Waddamana that has since been retired. The southern transmission system also includes some of the earliest transmission lines of the 220 kV network, which originated northwards from Waddamana Power Station (now Waddamana Substation) in 1957, and was extended southwards to Chapel Street Substation in Hobart in the early 1960s.

The recent construction (2011) of the Waddamana–Lindisfarne double circuit 220 kV transmission line (with a summer/winter rating of 420/500 MVA per circuit) has provided a secure 220 kV transmission network to southern Tasmania and relieved constraints that existed on the Liapootah–Chapel St 220 kV transmission corridor. This has reduced the requirement of the southern 110 kV network for bulk transmission purposes, and with the majority of these lines approaching end of life with asset health degrading and operational risks increasing, these factors result in a prospective $108m refurbishment program or $186m replacement program (like-for-like) over the next 25 years.

This forecast expenditure has driven the need for us to consider if a program of network rationalisation can deliver better value and service to Tasmanian electricity users in the long term.

To address the age and condition issues associated with the southern 110 kV transmission network, we are developing a long term fully integrated strategy to rationalise the southern 110 kV transmission network. This strategy aims to move the main grid function to the 220 kV transmission network, as far as possible, through the introduction of a strategically located connection between the 110 kV and 220 kV transmission networks in the central highlands of Tasmania. This will facilitate the decommissioning of end-of-life 110 kV lines and the refurbishment/replacement of remaining re-functioned 110 kV lines, resulting in lower transmission losses, increased network efficiency, reduced circuit length[11], reduced risk and lower life cycle cost. Figure 19 identifies the study area of the Southern Transmission Rationalisation Strategy.

Preliminary analysis suggests it is unlikely that any significant expenditure will be required until approximately 2020. To prepare for the execution of this strategy and ensure maximum benefit to customers, it is likely that we will need to commence detailed development of strategic southern transmission system redevelopment projects in 2018-19. We made allowance in our successful 2014-19 Revenue Proposal for capital expenditure in the 2018-19 financial year to cater for the detailed development of the first stage projects.

11 *Potentially up to 10% of TasNetworks transmission network route length may be decommissioned, resulting in a significant reduction in aged assets.*

9.6.3 Metering Strategy

Changes are being proposed to the National Electricity Rules to introduce competition in the provision of metering and related services to residential and small business customers. This is known as 'contestability'. The nature and timing of the final metering rule changes are not yet known.

This strategy involves assessing our options and determining our future position and role in response to metering contestability.

9.6.4 Wood pole management strategy

The management strategy for the wood pole assets aims to ensure that the risks associated with asset failure remain within TasNetworks risk appetite statement.

9.6.5 Distribution ground mounted switchgear replacement strategy

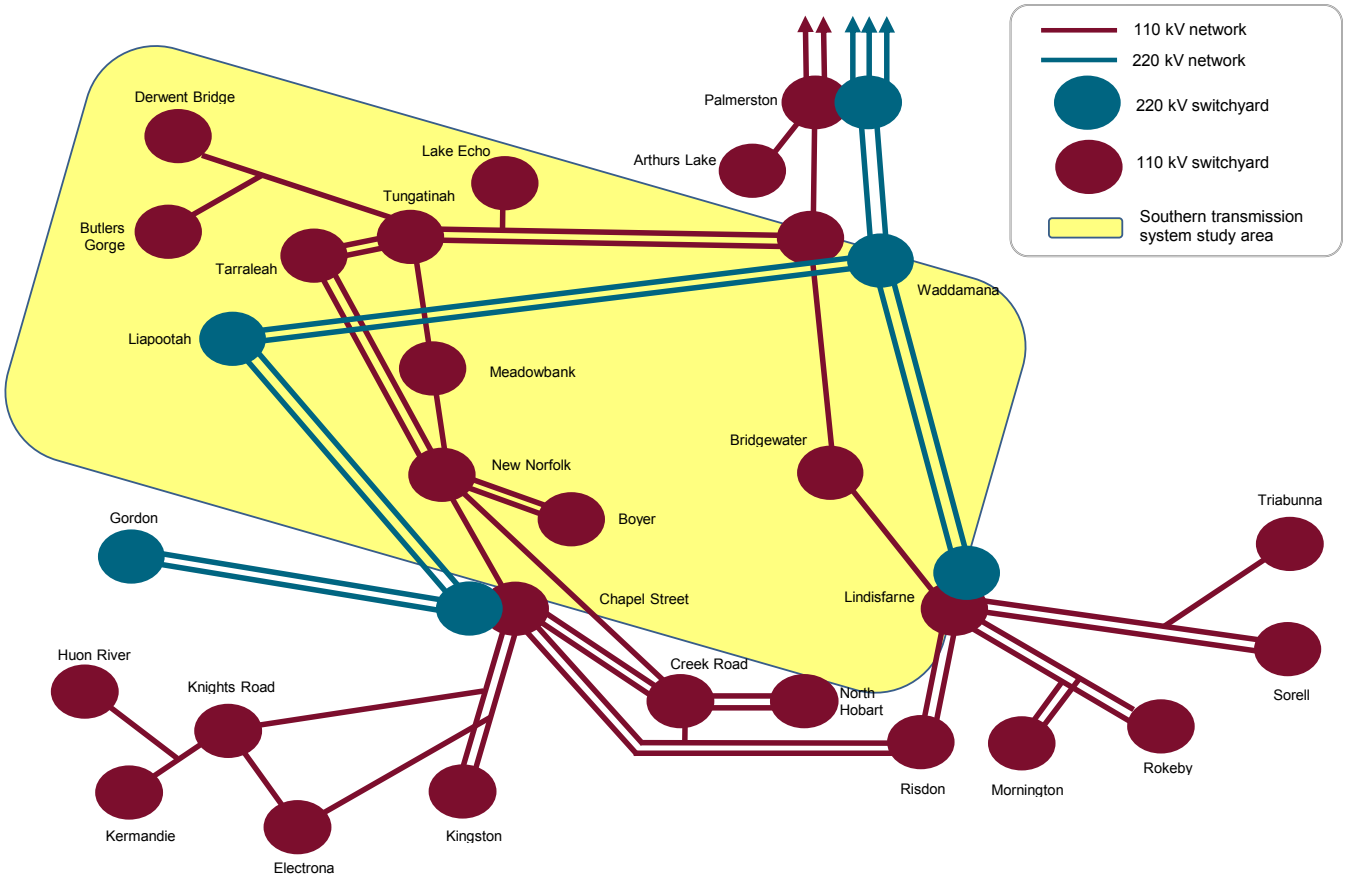
This strategy involves replacement of distribution ground mounted switchgear in poor condition that has the potential to cause an unacceptable safety risk.

9.6.6 Bushfire mitigation strategy

Bushfire initiated by our electricity infrastructure presents a significant risk to the business, public safety and property. We have identified the risk of bushfires started by our assets or operations as one of the highest risks to the business. The risk of "*Major bushfire start is attributed to TasNetworks assets and/or work practices, leading to fatality or permanent impairment of a member of the public.*" is included within TasNetworks' Key Risk Profile as 'Risk 10'.

To mitigate this risk we have developed a bushfire mitigation strategy, contained within our Bushfire Mitigation Management Plan. The key strategic objectives

Figure 19 Southern Transmission Rationalisation Study Area



of the Bushfire Mitigation Strategy and Management Plan are to:

- ensure no significant fires are started by TasNetworks' assets or activities undertaken by TasNetworks' staff and contractors;
- ensure no significant safety or environmental incidents occur as a result of bushfire mitigation activities;
- minimise cost to the community to a sustainable level;
- achieve compliance with the relevant legislative, regulatory and statutory requirements;
- demonstrate commitment in carrying out corporate and community responsibilities;
- ensure procedures are in place for managing liaison with external organisations;
- establish performance measures, targets and reporting framework for bushfire mitigation; and
- ensure a formal, documented management framework is in place for bushfire mitigation that includes mechanisms for review and continual improvement.

Our bushfire mitigation position is: *"To minimise the risk of fire ignition by at-risk distribution and transmission networks by ensuring our bushfire mitigation strategies and plans are aimed at protecting the lives and property of our employees and members of the community, and are aligned with industry best practice where applicable."*

To achieve this position, we will continue to:

- minimise the risk of fire ignitions from distribution and transmission network assets that could become a bushfire threatening public safety and property;
- ensure activities undertaken by TasNetworks' staff and contractors minimise the likelihood of fire ignition;
- comply with legislative, regulatory and statutory requirements;
- minimise the frequency and length of disruptions to the general public when responding to bushfires threatening or impacting the distribution and transmission networks;
- consider the safety of the community as a whole and employees engaged in the provision of services;
- ensure activities are managed in a way that minimises impact on the environment; and
- regularly review and develop management frameworks to ensure compliance with policies at the lowest sustainable cost.

9.6.7 Improve our response to faults and emergencies

This strategy involves increased installation of loop automation and fault indicators on key distribution feeders to improve restoration response based on our customers identifying this as a key factor in our engagement sessions with them. Also see 9.6.8 below.

9.6.8 Transmission and distribution network reliability strategy

Transmission network reliability is measured in terms of the number of Loss of Supply (LOS) events that occur during a calendar year. We have an obligation to monitor and report against service measures and objectives to national (AER) and state Office of the Tasmanian Economic Regulator (OTTER) regulatory bodies, and to customers such as Hydro Tasmania and major industrials.

In meeting these requirements we actively undertake:

- Performance monitoring;
- Performance benchmarking;
- Incident investigations; and
- Implementation of service improvement initiatives.

Distribution network reliability is a measure of performance with regard to frequency (number of events) and duration of unplanned interruptions to our customers. We have an obligation under the Code to manage the reliability performance of our network and to mitigate any reliability impacts on our customers and the broader Tasmanian community.

We have developed a service performance improvement strategy to manage our reliability obligations. This strategy takes into account numerous requirements and inputs which are shown in Figure 20.

Our reliability strategy seeks to:

- Maintain current overall network reliability performance in accordance with the principles of the economic incentive scheme whilst providing lowest sustainable prices and maximising value to our customers;
- Ensure compliance with regulation, codes and legislative requirements;
- Manage our risk profile to maintain a safe and reliable network, now and into the future with respect to cost effectiveness and reliability; and
- Reduce total outage costs for the network.

The strategy does not preclude enhancing network reliability where community, feeder or circuit performance is inadequate or where asset risk is unacceptably high. It is proposed that all reliability activities will be managed within the levels approved for reliability maintenance or improvement in the 2012-17 regulatory control period.

Seven worst performing feeders

This strategy (within the Transmission and Distribution Network Reliability Strategy) aims to improve the supply performance of the seven worst performing feeders within the distribution network, to meet the minimum regulatory requirements.

9.6.9 Increase condition and risk based asset management

A corporate initiative to implement systems and processes to better understand the condition and risk associated with our key assets.

9.6.10 Asset Management Improvement Program (AMIP)

Information on this strategy to improve asset management maturity can be seen in section 11.8. This strategy also includes the Asset Management Information System (AMIS) Improvement Program (Refer sections 3.11 and 11.8.1).

9.6.11 End to end (E2E) works management strategy

E2E is a business change project to update and align the transmission and distribution CAPEX and OPEX works management processes and accountabilities of the Strategic Asset Management, and Works & Service Delivery teams.

Figure 20 Reliability strategy considerations

TasNetworks Reliability Strategy is to:

Maintain current overall network service levels

9.6.12 TasNetworks Integrated Business Solution (Ajilis)

Ajilis is a business transformation project that is a key initiative of TasNetworks' One Business Strategy, and will assist in achieving one way of doing things at TasNetworks. Ajilis will align and integrate many of TasNetworks processes and systems, including asset management.

9.6.13 Operational support systems upgrade

This strategy aims to increase the capability of the SCADA and Network Control systems of the distribution network in response to the increasing level of innovation strategies and customer requirements being placed on it, eg. faster supply restoration.

Chapter 10

Management Plans Development

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10.1 Asset Management Plans

Asset Management Plans (AMPs) cover the existing asset base and are prepared for each significant asset category. They identify the performance issues and risks presented by each asset type within the category and define specific actions that must be undertaken to sustain asset and system performance. The AMPs also summarise the asset operating and capital expenditure requirements for each asset category.

Where appropriate, AMPs are supported by detailed condition assessment reports and maintenance standards to ensure transmission and distribution system assets are appropriately maintained and the detailed condition, and associated risk, of selected assets is well defined and understood.

The AMPs are available within our intranet site, The Zone, and cover all TasNetworks asset classes including:

10.1.1 Transmission Network

- Substations;
- Switching stations;
- Overhead lines;
- Underground cables;
- Weather monitoring systems; and
- Easements including vegetation

10.1.2 Distribution Network

- Overhead lines;
- Underground cables;
- Substations;
- Connection assets;
- Metering; and
- Vegetation including bushfire management

10.1.3 Telecommunications Network

- Bearers;
- Ethernet;
- Base sites; and
- Voice communications systems

10.1.4 Operational Support Systems

- Asset Management Information System

10.1.5 Non Network

- Information Technology;
- Facilities; and
- Vehicular Fleet

10.2 Area Development Plans

TasNetworks transmission and distribution system development program predominantly comprises of augmentation projects that provide new or modified connection points for customers, respond to increased local demands on the electricity system, or enhance security or quality of supply.

Our planning and capital investment activities are guided by customers and external agencies, including NER requirements established by the Australian Energy Market Commission (AEMC), requirements from the AER, OTTER and Department of State Growth (DSG). As a customer focussed organisation, customer consultation is a significant influence to system planning, providing dynamic and innovative opportunities to defer or avoid unnecessary asset investment.

We conduct system planning studies to determine the expected future operation of the transmission and distribution system in detail over a 15 year period. The outputs of the planning process are documented in the area development plans. From the area development plans, the projects that are required to meet Tasmanian and national electricity supply requirements for the forthcoming five year period are published in TasNetworks' Annual Planning Report (APR). The APR is issued in compliance with clauses 5.6.2 (a) and (b) of the NER. It also satisfies a licence obligation to publish a Tasmanian Annual Planning Statement (TAPS).

The key inputs to the transmission and distribution system planning process are:

1. Customer connections;
2. Electricity Supply Industry (Network Performance Requirements) Regulations 2007;
3. Grid vision;
4. National Electricity Rules (NER); and
5. Load forecasts.

The area development plans are available within our intranet site, The Zone, and cover the seven planning areas of Tasmania, as well as a State-wide and cross-area planning document.

10.3 Annual Planning Report

We produce the Annual Planning Report (APR) to provide information on planning activities we have undertaken in the past year. We conduct an annual planning cycle to analyse the existing network and consider its future requirements to accommodate changes to load and generation, and whether there are any problems in meeting the required performance standards. We then look for opportunities for innovative solutions to address any emerging issues. We do this in consultation with our customers and in accordance with our relevant legal obligations.

The APR covers a 10-year planning period and presents the outcomes of the above-mentioned planning studies, in accordance with our obligations under clause 5.12.2 and 5.13.2 of the National Electricity Rules (the Rules) for the publication of Transmission and Distribution Annual Planning Reports. The APR also includes the requirements of the Tasmanian Annual Planning Statement, in accordance with clause 15 of our transmission license issued under the Electricity Supply Industry Act 1995 and as set by OTTER. We are required to publish the APR by 30 June each year, in accordance with clause 5.12.2(a) and 5.13.2(a)(1) of the Rules and in conjunction with clause 8.3.2 of the Tasmanian Electricity Code (the Code). The APR is publicly available on our internet site.

In addition to these requirements, we present further information to better inform our audience about the issues and opportunities in our network. We provide this information so that our audience is aware of:

- The capability of our network to transfer electrical energy;
- How the network may affect their operations;
- The locations that would benefit from supply capability improvements or network support initiatives;
- Locations where new loads or generation could be readily connected; and
- Locations where assets are no longer required and are planned to be de-commissioned.

We actively investigate alternate options to traditional network augmentation or straight like-for-like equipment replacements to address issues. Our intent is that the APR provides existing and potential new customers and non-network solution providers with preliminary information to prompt discussion on opportunities for solutions to address issues.

Chapter 11

Performance Evaluation and Improvement

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11.1 Overview

This chapter focuses on the performance of the network in recent years. Firstly, we present information about performance benchmarking by the AER. We then present information about the reliability of the transmission and distribution networks, and our performance against our target thresholds.

11.2 How We Compare

The AER uses benchmarking to measure and compare the operating efficiency of electricity transmission and distribution networks. We are using the AER's benchmarking data to understand how we compare with other network businesses and what we need to do better. In particular, the AER uses total cost and operating cost benchmarking to help to set expenditure allowances.

Figure 21 below illustrates that the AER's operating cost benchmarking places us in the top half of the Australian distribution networks over the period of 2006 to 2013, whilst Figure 22 illustrates that the AER's total cost benchmarking places us at the top of the Australian transmission networks over the period of 2006 to 2014. Our merger efficiencies and transformation program should see our relative performance improving over time.

In addition to AER benchmarking, we participate in the biennial International Transmission Operations and Maintenance Study (ITOMS) benchmarking exercise.

The ITOMS exercise involves the collection of operational asset, system and financial data to produce business level performance indicators. Our performance is benchmarked against other TNSPs both in the Australia/South Pacific region and across the world. Typical outcomes from this benchmarking exercise include sharing best practice asset management regimes and identifying various aspects of our maintenance practices that are either performing well or poorly in comparison with other similar TNSPs.

Figure 23 presents TasNetworks (identified as Transend) overall benchmarked performance against all other ITOMS participants for the last seven reporting periods.

The international benchmarked averages (cost & service) are shown as the centre crosshairs, and the regional averages are shown as triangles marked NA (North America), EUR (Europe), ASP (Australia South Pacific), and SCAN (Scandinavia).

Figure 23 shows that we have improved our benchmarked cost performance over time to be considerably better than both the international and Australia South Pacific benchmarked averages, while service performance has recently moved to virtually match both the international and Australia South Pacific benchmarked averages.

We will continue to keep abreast of advances in asset and system performance improvement and reporting initiatives not only through continued participation in these benchmarking exercises, but also through ongoing close cooperation and sharing of information with counterparts in other TNSPs.

Figure 21 Distribution operating cost benchmarking using AER data – AER Stochastic Frontier Analysis Model, raw efficiency scores (the best performer has the highest score)

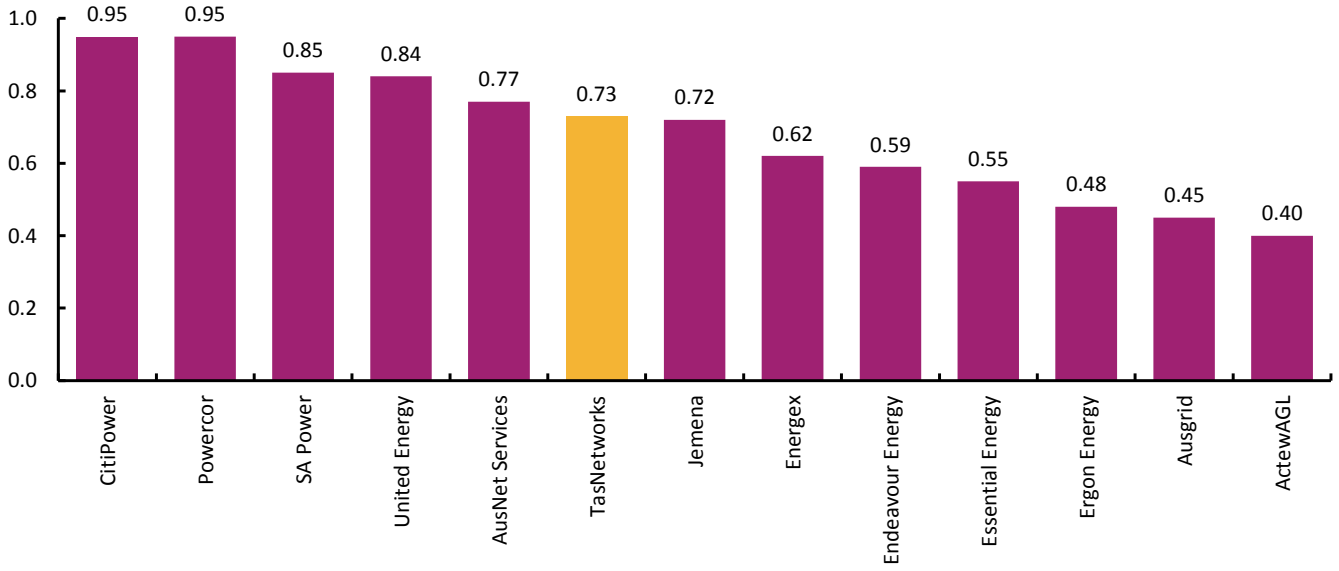


Figure 22 Transmission total cost benchmarking using AER data – Multilateral Total Factor Productivity Model[12] (the best performer has the highest score)

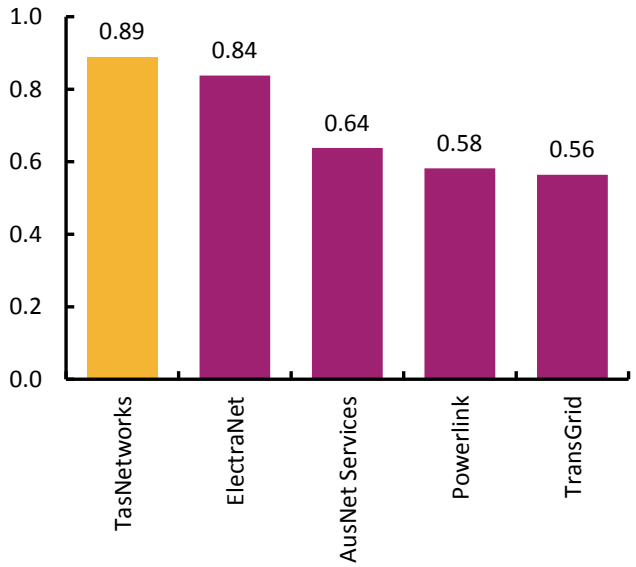
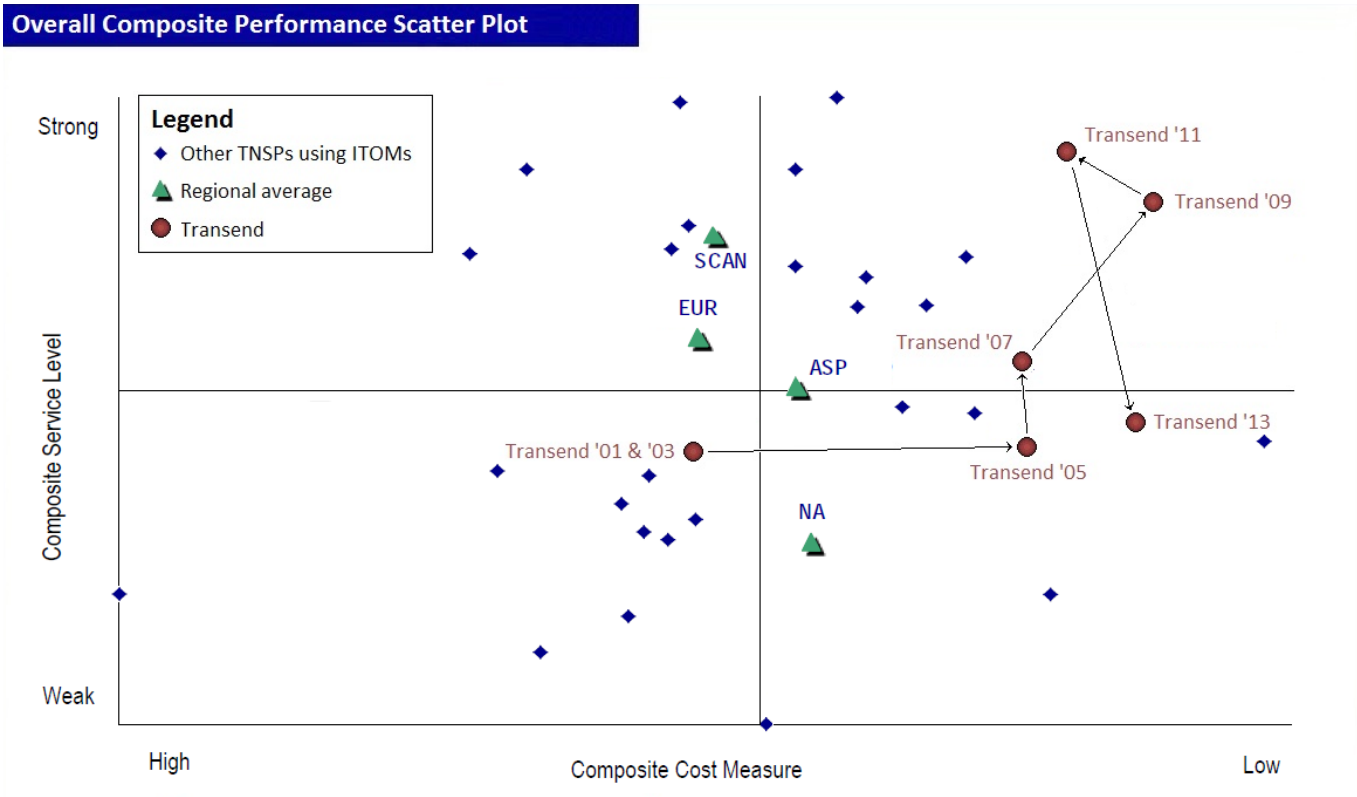


Figure 23 ITOMS transmission operating performance benchmarking



12 *Sourced from Figure 13 'Relative MTFP performance of transmission networks' of AER draft annual benchmarking report, dated Nov 2015.*

11.3 Tasmanian Supply Reliability

Reliability of supply is a key indicator in measuring network performance and is an indicator of the impact of supply interruptions to customers. We measure the duration, frequency and impact of supply interruptions using different measures for the transmission and distribution networks. We continually analyse the performance of our electricity network and regularly report to the OTTER and the AER against our measures. Our performance against the reliability targets set by the AER is a key component of our service target performance incentive scheme (STPIS).

The following sections provide information on network reliability targets and historical performance.

11.4 Transmission Reliability

Transmission network reliability is monitored and reported to the AER and OTTER in terms of the number of loss of supply (LOS) events that occurred during the year[13]. Loss of supply is measured in 'system minutes' and is calculated by dividing the total energy (MWh) not supplied to customers during an event by the energy supplied during one minute at the time of historical Tasmanian maximum demand[14].

The AER sets our target for the number of loss of supply events allowed per year as part of each regulatory control period. Since 2009 the target has been 15 or less events greater than 0.1 system minute and 2 or less events greater than 1.0 system minute. Table 5 below presents the loss of supply performance of the transmission network.

11.5 Distribution Reliability

Reliability in the distribution network is measured in frequency and duration and reported as averages termed SAIFI and SAIDI totalled over a 12-month period. SAIFI is the System Average Interruption Frequency Index (measured in number of interruptions) whilst SAIDI is the equivalent measure for duration (measured in minutes).

A SAIFI of two indicates that, on average, all customers in an area of study experienced two loss of supply events during the year. A SAIDI of 10 minutes indicates that, on average, those customers experienced a cumulative loss of supply for 10 minutes during the year.

For the purposes of measuring distribution supply reliability, Tasmania has been divided into 101 supply reliability communities. Each community is categorised into one of five supply reliability categories:

- Critical infrastructure (1 community);
- High density commercial (8);
- Urban and regional centres (32);
- High density rural (33); and
- Low density rural (27).

The Tasmanian Electricity Code (the Code), enforced by OTTER, specifies the reliability performance standards for both the supply reliability communities and categories. We are required to use reasonable endeavours to ensure that each supply reliability community and category meet these standards. In addition, the AER sets thresholds for the supply reliability categories (not communities) each regulatory control period as part of our performance incentive scheme. These are set based on our actual performance in the preceding five years, with the intention that we maintain our reliability performance. We report distribution reliability to OTTER on a quarterly and financial year basis, and to the AER on a financial year basis.

We are pursuing aligning our different reliability requirements and reporting frequency to promote efficiency.

The following sections report our distribution reliability performance against the thresholds set by the Code and by the AER since 2009-10.

Table 5 Transmission network reliability performance

Performance Measure	Target	2009	2010	2011	2012	2013	2014
Number of LOS events >0.1 system minute	≤15	8	9	11	10	10	3
Number of LOS events >1.0 system minute	≤2	2	2	6	2	1	0

13 Reporting to the AER and OTTER is by calendar and financial year, respectively.

14 An event of one system minute equates to approximately 31.2 MWh of unserved energy.

11.5.1 Performance against the Code standards

Supply Reliability Categories

Tables 6 and 7 present our performance for reliability categories for SAIFI and SAIDI, respectively, against the standards specified in the TEC. This performance is as we provide to the TEC as part of our normal reporting process. The standards exclude outages caused by third-party faults and customer plant, and the transmission network.

Table 6 SAIFI supply reliability category performance

Supply Reliability Category	Threshold (interruptions)	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15
Critical infrastructure	0.20	0.19	0.18	0.22	0.27	0.21	0.34
High density commercial	1.00	0.76	0.44	0.27	0.43	0.47	0.33
Urban and regional centres	2.00	1.38	1.01	1.03	0.92	0.85	1.25
High density rural	4.00	3.69	2.59	2.29	2.36	2.18	2.94
Low density rural	6.00	4.16	3.51	3.72	3.49	3.11	4.04

Table 7 SAIDI supply reliability category performance

Supply Reliability Category (number of communities)	Threshold (minutes)	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15
Critical infrastructure (1)	30	21	15	25	30	16	57
High density commercial (8)	60	80	31	32	77	43	27
Urban and regional centres (32)	120	209	114	85	94	164	169
High density rural (33)	480	798	341	259	269	521	582
Low density rural (27)	600	992	575	498	547	740	931

Supply Reliability Communities

In addition to performance requirements for supply reliability categories detailed above, the Code also sets performance standards for the supply reliability communities within the categories. Table 8 and Table 9 present our performance for the 101 supply reliability communities against the SAIFI and SAIDI standards, respectively. The tables present the standards specified in the TEC for each community across the five categories, and the number of communities in each category that is not meeting the standard.

Table 8 Number of poor performing communities (SAIFI)

Supply Reliability Category (number of communities)	Threshold (interruptions)	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15
Critical infrastructure (1)	0.2	0	0	1	1	0	1
High density commercial (8)	2	1	0	0	0	0	0
Urban and regional centres (32)	4	1	1	1	2	3	3
High density rural (33)	6	4	0	3	2	6	4
Low density rural (27)	8	2	0	2	1	2	0
Total (101)		8	1	7	6	11	8

Table 9 Number of poor performing communities (SAIDI)

Supply Reliability Category (number of communities)	Threshold (minutes)	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15
Critical infrastructure (1)	30	0	0	0	1	0	1
High density commercial (8)	120	1	0	1	3	0	0
Urban and regional centres (32)	240	11	5	5	5	12	13
High density rural (33)	600	11	2	3	4	11	13
Low density rural (27)	720	10	9	6	6	14	12
Total (101)		33	16	15	19	37	39

11.5.2 Performance against AER Standards

At the commencement of each distribution regulatory control period, the AER, as part of our revenue determination, sets standards for distribution network reliability. These standards form part of our service target performance incentive scheme (STPIS) and are calculated on our actual performance for the preceding five years. The standards set by the AER exclude planned outages to the network, Major Event Days, outages caused by customer plant and certain third-party faults.

Table 10 and Table 11 present our performance for reliability categories for SAIFI and SAIDI, respectively, against the standards specified by the AER. These standards have been set for our 2012 to 2017 distribution regulatory control period. Although performance prior to 2012 to 13 is shown, we were not subject to the standards presented in these tables as reliability did not form part of the STPIS for the distribution network at that time.

In these tables, the 2009 to 2010 and 2010 to 2011 data formed part of what was provided to the AER in setting our thresholds for 2012 to 2017. The 2011 to 2012 data is estimated; it was unpublished to the AER and uses our current network capacity as a basis for the performance calculations in conjunction with actual outage data.

The tables also show our forecast reliability performance for the remainder of the regulatory control period. In forecasting our performance, we use the method the AER uses to calculate our reliability thresholds. That is, we extrapolate our performance using our average performance during the preceding five years (including 2014-15). We forecast reliability performance to generally align with our current STPIS standards.

Table 10 SAIFI supply reliability category performance (AER)

Supply Reliability Category	Threshold (2012–17) (interruptions)	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	Forecast to 2016–17
Critical infrastructure	0.22	0.09	0.19	0.26	0.17	0.13	0.19	*0.19*
High density commercial	0.49	0.63	0.33	0.21	0.30	0.32	0.27	*0.29*
Urban and regional centres	1.04	1.09	0.78	1.01	0.82	1.21	0.85	*0.93*
High density rural	2.79	2.86	2.10	2.20	2.21	3.00	2.10	*2.32*
Low density rural	3.20	3.18	2.90	3.36	3.00	4.65	2.77	*3.34*

Table 11 SAIDI supply reliability category performance (AER)

Supply Reliability Category	Threshold (2012–17) (minutes)	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	Forecast to 2016–17
Critical infrastructure	20.79	5.01	11.72	16.90	4.65	6.83	23.29	*12.68*
High density commercial	38.34	63.79	18.62	13.57	33.61	27.66	23.22	*23.34*
Urban and regional centres	82.75	86.00	58.76	67.55	64.19	101.89	76.88	*73.86*
High density rural	259.48	283.60	169.86	206.15	203.25	289.29	239.17	*221.55*
Low density rural	333.16	360.75	287.84	383.44	358.41	533.00	360.34	*384.61*

The low density rural supply reliability category is the only category forecast to perform worse than the current standard, in both measures, though only marginally. This is as a result of a particularly poor year experienced in 2013-14. It also reflects the continued challenges in maintaining reliability in the communities in this category, due to the large geographical areas covered by the high voltage feeders and limited alternate supply options.

11.6 Tasmanian Supply Reliability Summary

As detailed in Section 9.6.8, our reliability strategy includes maintaining overall network reliability performance while ensuring compliance with our relevant requirements. As per our asset management objective on performance, the reliability strategy does not preclude enhancing network reliability where performance is inadequate or where asset risk is unacceptably high. We have maintained good reliability performance of the transmission network in recent years. This resulted from a focus on continual service improvement with many initiatives included in operational and capital programs. This included the following initiatives:

- improving our incident investigation and remediation process;
- incentive schemes to improve performance;
- improved maintenance practices; and
- targeted replacement of aged and unreliable assets.

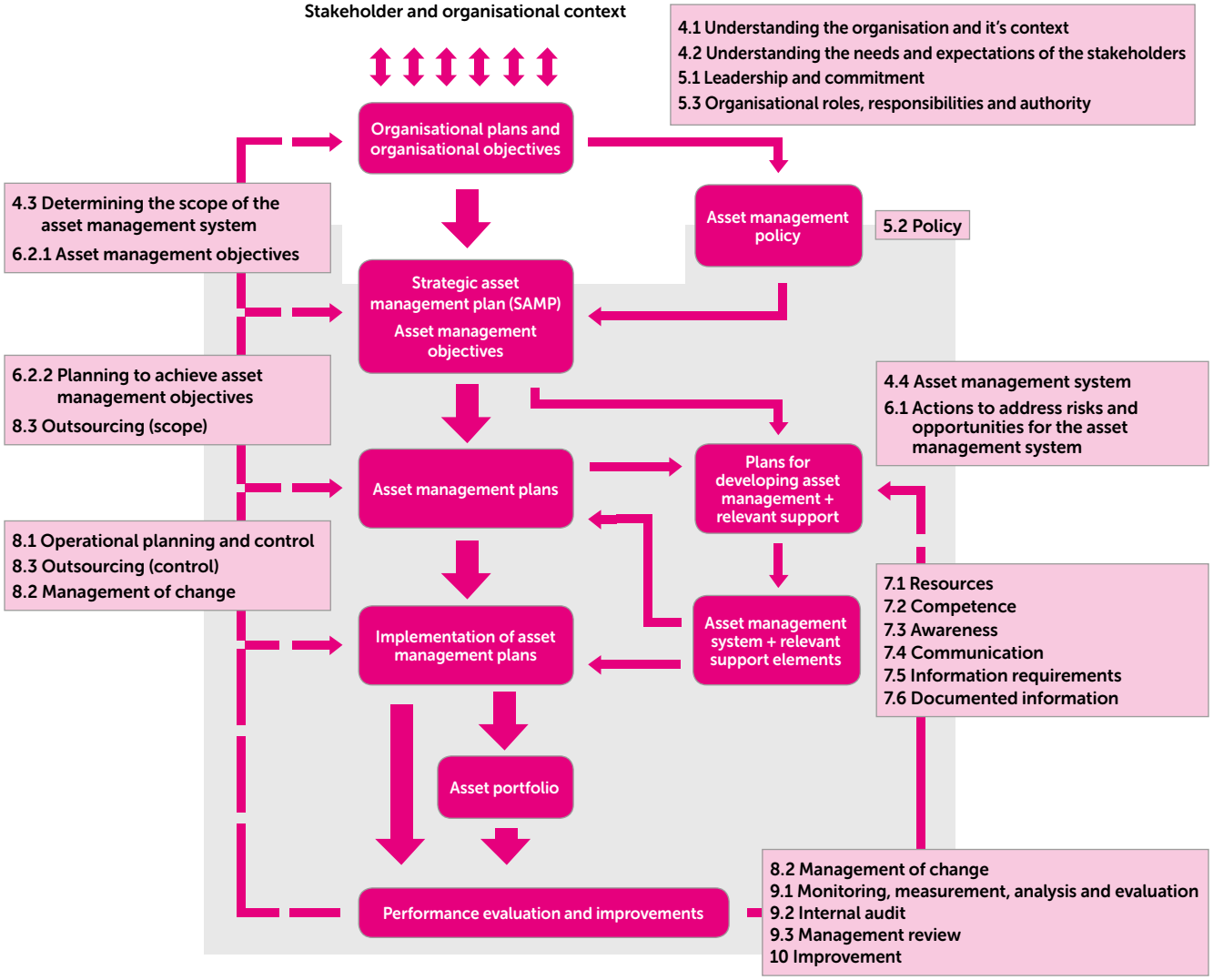
Reliability performance of the distribution network has been trending down in the last two years. Following investment in the 2007 to 2012 regulatory control period to improve reliability, we have limited our investment in recent years with a focus on maintaining reliability levels. However, reliability in a number of communities and categories has not met the target standards in the last two years, predominantly due to a number of Major Event Days and other weather events. The SAIDI measure is most affected by these events as they tend to affect a number of reliability communities and there are limited resources to attend to these concurrent faults, thereby lengthening the restoration times. A service performance improvement program has commenced to address the seven worst performing feeders that supply the poor performing communities.

11.7 Asset Management Maturity

During the business start-up phase we commissioned an independent AM maturity assessment against the requirements of ISO 55001:2014. This was completed in August 2014.

The objective of the maturity assessment was to determine the current level of AM process and system sophistication of both distribution and transmission asset management. The maturity assessment was completed for transmission and distribution network assets, communications assets and dedicated AM system assets. The ISO 55001:2014 assessment framework and structure can be seen in Figure 24 which shows the ISO 55002:2014 relationship between the key elements of an asset management system, together with the related ISO 55001 clauses.

Figure 24 ISO 55002:2014 Relationship between Key Elements of an Asset Management System and related ISO 55001:2014 clauses



NOTE 1 Only the primary connections are shown to avoid over complexity

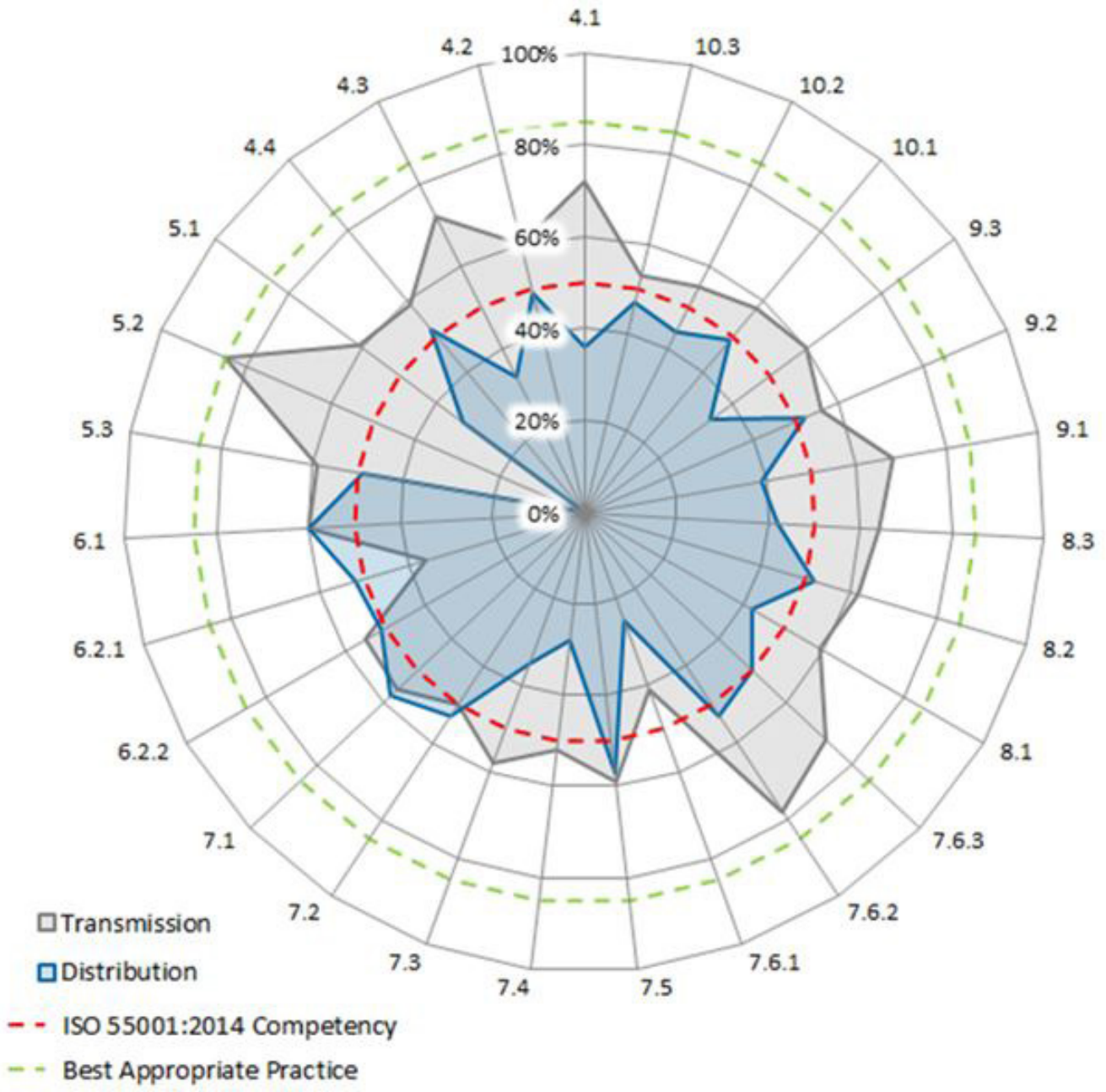
NOTE 2 This does not aim to repeat the distinction between asset management and an asset management system: it is a connections view showing directions of influence

NOTE 3 The grey highlighted box designates the boundary of the asset management system.

11.7.1 Assessment Findings

The assessment enabled a baseline competency level to be established for both distribution and transmission AM functions, which is presented in Figure 25 below. The red dashed circle defines the level required for ISO 55001:2014 competency.

Figure 25 Asset management competency levels



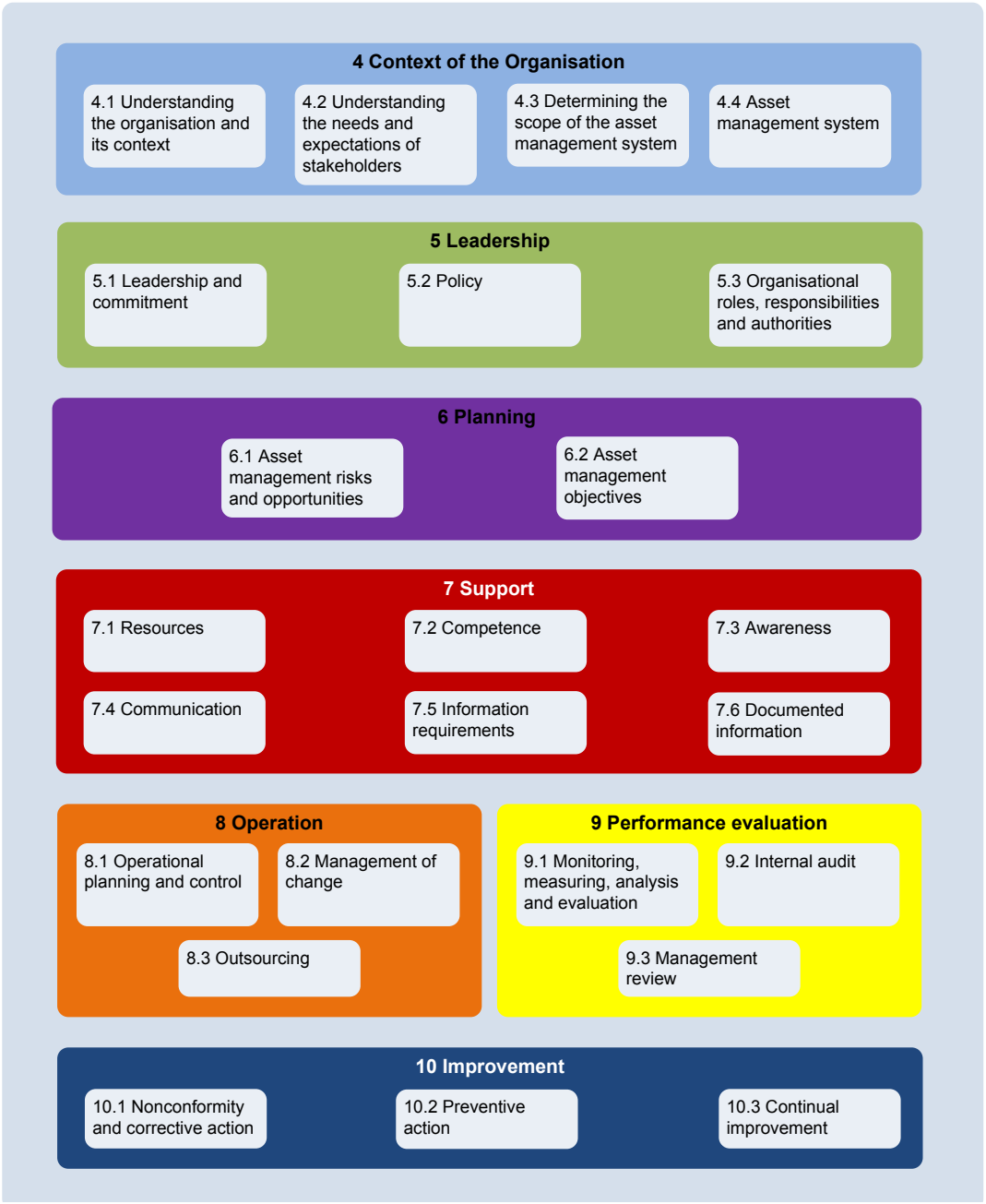
11.8 Asset Management Improvement Program

The AM maturity assessment enabled a gap to be quantified, and outlined a prioritised AM improvement program which has been used as a key input into the development of our AM improvement program.
The AM improvement program elements and activities have been structured to ensure alignment with ISO 55001:2014, as shown in Figure 26 below[15].

The AM improvement program is targeted to improve AM maturity to the level necessary to achieve 'competence' maturity level[16] of ISO 55001:2014 over a period of approximately three to five years. Accreditation to ISO 55001:2014 is not the key goal at this time.

The priorities for the capability improvement activities within the AM improvement program have been developed with consideration of the key deliverables for the distribution revenue reset project and to feed in to the business transformation plan as appropriate.

Figure 26 Asset management improvement program elements and sub-elements



15 *Figure 26 diagrammatically depicts ISO55001:2014 Asset Management – Management Systems – Requirements, and clauses 1, 2 and 3 are superfluous and are omitted for clarity*

16 *Equates to a minimum target level of the red dashed circle in Figure 25.*

11.8.1 Asset Management Information Systems Improvement Program

This program, as a key component of the above AM improvement program, identifies and outlines the approach for addressing areas of improvement regarding network asset information and the related systems, tools and applications as well as business processes and procedures. The program includes areas that require improvement as identified by the AM maturity assessment, as well as other areas of opportunity that have been identified by the business.

The program has been developed with consideration of ISO55001:2014 requirements. It is intended that the program will serve as an ongoing framework for continual improvement of network asset information holdings, with the recommended timeframe for implementation aligning with that of the overarching AM improvement program.

The program will deliver a wide range of improvement initiatives essential to support effective and efficient asset management. The Asset Management Information System Improvement Program (AMISIP) is described further in the Asset Management Information System AMP document referred to in section 10.1.4.

As outcomes of the program are progressively completed they will be used to continuously update and improve the TasNetworks AMIS AMP. The outcomes will also become enablers for other TasNetworks projects and innovations to deliver additional value across the business

Appendix A – Asset Management Policy

Asset Management Policy

TasNetworks delivers electricity and telecommunication network services, creating value for our customers, our owners and the community.

This Asset Management Policy applies to all TasNetworks assets and associated activities. Our team members and contractors must comply with this policy and will be supported, resourced, and trained to follow this policy and associated documentation.

Consistent with our vision and purpose, we strive for excellence in asset management and are committed to providing a safe working environment, value for our customers, sustainable shareholder outcomes, care for our assets and the environment, safe and reliable network services, whilst effectively and efficiently managing our assets throughout their life-cycle.

To achieve this commitment, together we will:

- manage our assets to meet the strategic goals, measures and initiatives outlined in the Corporate Plan;
- comply with relevant legislation, licences, codes of practice, and industry standards;
- apply contemporary condition assessment and risk management techniques to identify and effectively manage risks and opportunities, including at a portfolio level;
- continually adapt, benchmark and improve asset management strategies and practices and apply contemporary asset management techniques, consistent with industry best practices;
- develop and continually improve asset management processes and systems to optimise asset management efficiencies and decision making processes;
- adopt the lowest whole-of-life cost solutions for investment in asset creation, replacement or refurbishment projects;
- operate assets safely within prescribed limits and apply dynamic ratings where appropriate;
- maintain a complete and accurate register and documentation system of all our assets;
- prepare and maintain high quality asset management plans, standards, guidelines and procedures;
- ensure our team members are trained, authorised and competent to undertake their work activities;
- work closely with internal and external service providers and contractors to ensure that work performed on assets is consistent with the relevant standards and this policy; and
- undertake periodic audits to ensure assets are being managed in accordance with this policy and the asset management framework, plans, standards, guidelines and procedures.

Lance Balcombe
Chief Executive Officer

Dr Dan Norton AO
Chairman

This policy forms part of TasNetworks' asset management system and framework, which is maintained in accordance with Australian and International standard AS/NZS ISO 55001:2014.

August 2014

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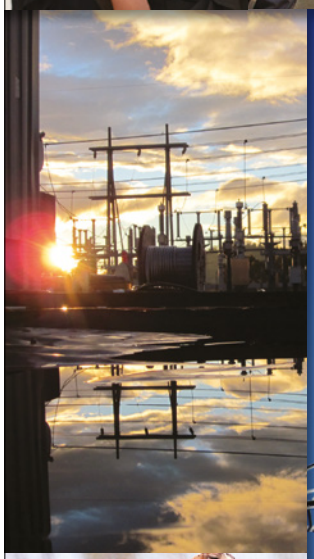
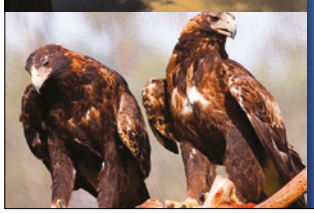
Appendix B – Zero Harm Policy

Zero Harm Policy
Health, Safety, Environment and Quality









TasNetworks delivers electricity and telecommunication network services, creating value for our customers, our owners and the community.

Zero Harm is about looking after ourselves, our workmates, our contractors, the community and the environment at all times. It is about raising awareness and focusing on behaviours to continually improve the way we work at TasNetworks.

This Zero Harm Policy applies to all TasNetworks activities. Our team members and contractors must comply with this policy and will be motivated, resourced, and trained to follow this policy and associated standards and procedures.

Our Zero Harm goals are:

- No harm to our people and the public.
- Minimising our impact on the environment.

We will actively engage and consult with our people, our customers and other relevant stakeholders to achieve Zero Harm. Achieving Zero Harm requires ongoing and unwavering commitment from all TasNetworks team members and contractors.

This commitment means you are responsible for:

- working safely – demonstrating a strong safety culture and positively intervening in at-risk situations;
- working in accordance with the law and other requirements; and
- demonstrating care for the environment in the way you work.

To achieve this commitment, together we will:

- carefully plan and manage our impacts, proactively identify and manage risks so far as is reasonably practicable to prevent harm;
- intervene, delay or stop activities that have the potential to cause injury, ill health or adverse environmental impacts, including pollution, until effective controls are in place;
- actively encourage each other to improve health, safety, general wellbeing and fitness and ensure employees are supported when injured or ill, regardless of whether the injury or illness occurred at work or at home;
- ensure our team members are trained, authorised and competent to undertake their work activities;
- seek out, identify and implement opportunities that create value by integrating sustainability principles into our activities, using resources efficiently, minimising waste and physical impacts;
- take responsibility for the quality of our work and participate in achieving quality outcomes for our customers;
- actively report all health, safety and environmental incidents or concerns, including near-hits, and recommend solutions to health, safety, environment and quality issues; and
- set and regularly review health, safety, environment and quality objectives and targets to achieve continual improvement, monitor performance and recognise and reward achievements.

Our standards and procedures are designed to follow best practice codes and support compliance with the law.

We manage health, safety, environment and some key business processes within a quality framework. We will not compromise on Zero Harm while working to meet our customers' needs and delivering quality outcomes.

Lance Balcombe
Chief Executive Officer

Dr Dan Norton AO
Chairman

This policy forms part of TasNetworks' integrated health, safety, environment and quality management system, which is maintained and externally certified in accordance with Australian and international standards (AS/NZS4801:2001, AS/NZS ISO 14001:2004 and AS/NZS ISO 9001:2008). July 2014

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Appendix C – Glossary and Abbreviations

Glossary

The definitions provided here are common electricity industry definitions, provided to assist readers who may be unfamiliar with particular industry terminology.

Terms marked [R] are also formally defined in Chapter 10 of the National Electricity Rules (the Rules). The definitions given below may be different from the Rules definitions. For the purposes of interpreting the requirements of the Rules, the formally defined terms within the Rules should be used.

Basslink	A privately owned undersea cable connecting the Tasmanian electricity network to that of mainland Australia. Basslink is described in Section 4.2
Bay	The suite of electrical infrastructure installed within a substation to connect a specific incoming transmission line, distribution feeder, transformer or generator to the main body of the substation.
Code	Refers to the Tasmanian Electricity Code. The Code addresses Tasmanian jurisdictional interests which are not dealt with by the Rules.
Distribution network	The suite of electrical infrastructure assets required to transmit power from the transmission network to the consumer. [R]
Embedded generator	A generating unit that is directly connected to the distribution network as opposed to the transmission network. [R]
Energy generated	The total amount of electrical energy injected into the transmission network to meet the Tasmanian energy sales. It comprises the energy sent out from Tasmania's power stations, plus the energy imported via Basslink, minus energy exported to Basslink. It includes network losses but excludes power station auxiliary loads.
Energy sales	The total amount of electrical energy consumed in Tasmania for a particular period.
ESI Regulations	Reference to the Electricity Supply Industry (Network Planning Requirements) Regulations 2007.
Guaranteed Service Level scheme	A payment scheme where our retail customers are compensated for prolonged and excessive interruptions to their supply.
kilo-volt	One kilo-volt equals 1,000 volts. See also: voltage.
market network service provider	A network service provider whose network links two connection points located in different NEM regions, the power transfer between which can be independently controlled and dispatched via the central dispatch process. The network must not be the subject of a revenue determination by the Australian Energy Regulator. Basslink is the only MNSP in the NEM. [R]
network	The apparatus, equipment, plant and buildings used to convey, and control the conveyance of, electricity to customers. See also: distribution network; transmission network. [R]
non-network solution	A solution to a network issue that does not require the construction of a network augmentation. Examples include electronic control schemes and demand side management.
Rules	The National Electricity Rules
substation	An installation of electrical infrastructure at a strategic location on the network to provide the functions of voltage transformation, switching and voltage conversion. [R]
switching station	A substation without power transformers, operating at a single voltage level.
transition station	Refers to the network location where a transmission circuit transitions from underground cable to overhead transmission line, or vice versa.
transmission network	The suite of electrical infrastructure required to transmit power from the generating stations to the distribution network and directly connected industrial consumers. In Tasmania, the transmission network comprises the network elements that operate at voltages of either 220 kV or 110 kV, plus the equipment required to control or support those elements. [R]
voltage	The force which causes electrical current to flow. [R]

Abbreviations

Acronym	Description
AC	Alternating Current
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
APR	Annual Planning Report
DC	Direct Current
DNSP	Distribution Network Service Provider
EHV	Extra High Voltage
ESI	Electricity Supply Industry
GSL	Guaranteed Service Level
GWh	Gigawatt hour
Ha	Hectare
HV	High Voltage
Hz	Hertz
kA	Kiloamps
kV	Kilovolts
LEOY	Likely end of year
LOS	Loss of Supply
MAIFI	Momentary System Average Interruption Frequency Index
MED	Major Event Day
MD	Maximum Demand
MNSP	Market Network Service Provider
MV	Medium Voltage
MVA	Megavolt Amperes
MW	Megawatts
MWh	Megawatt hour
NEM	National Electricity Market
NER	National Electricity Rules
OTTER	Office of the Tasmanian Energy Regulator
PV	Photovoltaic [solar generation system]
REC	Renewable Energy Certificate
RET	Renewable Energy Target
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control And Data Acquisition
SPS	System Protection Scheme
STPIS	Service Target Performance Incentive Scheme
TNSP	Transmission Network Service Provider

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