2017–19 TasNetworks Regulatory Proposal Expenditure Forecasting Methodology

Version Number 1

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Tasmanian Networks Pty Ltd (ACN 167 357 299)

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1 Introduction

Tasmanian Networks Pty Ltd (TasNetworks) owns and operates the electricity transmission and distribution network in Tasmania. Our core business is providing safe, reliable and efficient electricity transmission, distribution and telecommunication services in a national market.

In January 2016 we will submit to the Australian Energy Regulator (AER) a Regulatory Proposal for our distribution services. To align future transmission and distribution reviews, the proposal covers the two year period from 1 July 2017 to 30 June 2019.

This document provides early notification of the expenditure forecasting methodologies we intend to adopt in our Regulatory Proposal. We are required to provide this information to the AER in accordance with clause 6.8.1A of the National Electricity Rules (the Rules). This document outlines the business as usual expenditure forecasting methodology for standard control services, which are generally defined as those services related to building and maintaining the shared distribution network. If our forecasting approach is amended in the Regulatory Proposal, we will explain how and why it has changed.

The primary purpose of this document is to engage with the AER on our expenditure forecasting methodologies and to support the AER's assessment of our expenditure forecasts. The document is also available to interested stakeholders and customers to assist them to better understand our Regulatory Proposal.

The remainder of this document is structured as follows:

- section 2 provides an overview of our approach to consulting with our customers and meeting the Rules requirements;
- section 3 provides an overview of our asset management and investment governance framework;
- sections 4 and 5 describe our proposed capital and operating expenditure forecasting methodologies respectively; and
- section 6 sets out brief closing comments.

2 Meeting our customers' needs and the Rules requirements

Our objective is to ensure that our forecast expenditure addresses our customers' needs, complies with the Rules and is approved by the AER. In particular, the Rules require that we propose operating and capital expenditure forecasts that achieve each of the following objectives:

- meet the expected demand for standard control services over the period;
- comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;
- maintain the quality, reliability and security of supply of standard control services (or otherwise satisfy an applicable regulatory obligation); and
- maintain the reliability, safety and security of the distribution system through the supply of standard control services.

The AER must accept our total expenditure forecasts if the AER is satisfied that the forecasts reasonably reflect:

- the efficient costs of achieving the expenditure objectives;
- the costs that a prudent operator would require to achieve the expenditure objectives; and
- a realistic expectation of the demand forecast and cost inputs required to achieve the expenditure objectives.

Our expenditure forecasts must also comply with the following cost allocation principles:

- expenditure must be properly allocated to the relevant category of distribution services[1] in accordance with the principles and policies set out in our Cost Allocation Methodol; and
- expenditure must not include any amounts relating to a contingent project[2].

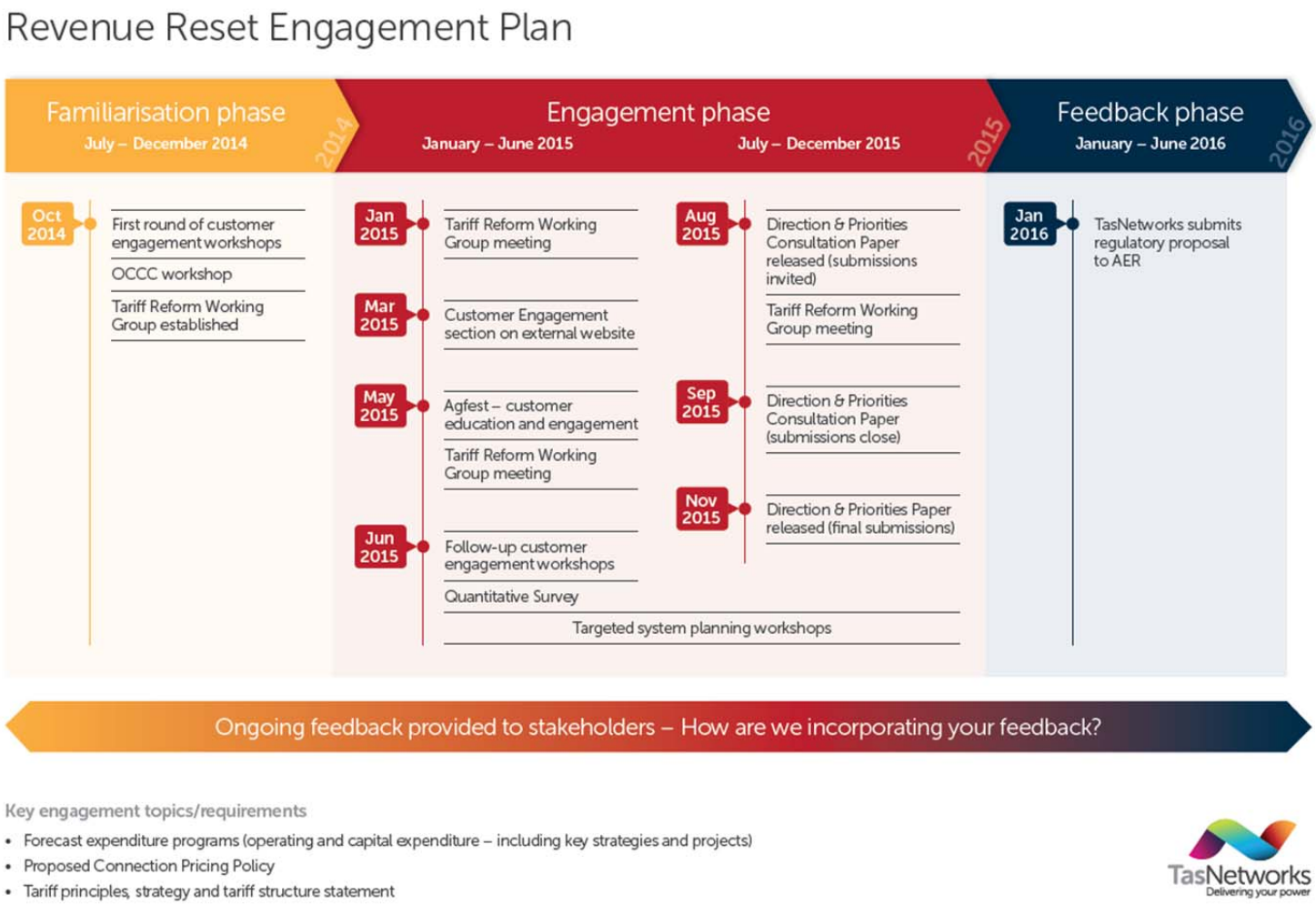
In addition to ensuring that we comply with these Rules requirements, it is essential that our expenditure plans reflect our customers' price and service preferences. As a new business, we are increasing our efforts to ensure customers are integral to our planning and investment processes, and hence our expenditure plans. We are also conscious that we can play a key role in managing electricity prices by finding better ways of delivering the service outcomes that our customers expect.

TasNetworks is undertaking a comprehensive set of consumer engagement activities. TasNetworks began its first round of targeted consumer engagement in October 2014 to understand customers' preferences. A high level customer engagement program has been developed to inform our future investment decisions. The customer engagement program is represented in Figure 1.

[1] In accordance with the requirements of clause 6.5.7.b(2) of the Rules.

[2] As defined under clause 6.6A.1(b) of the Rules.

Figure 1: TasNetworks' customer engagement program



The output from the customer engagement process will feed into our planning process and our expenditure forecasting.

3 Asset management and investment governance

At TasNetworks, we manage our assets in a way that satisfies the national electricity objective, and therefore serves the long term interests of our customers. TasNetworks also operates under a Statement of Expectations issued by our shareholders, the Tasmanian Treasurer and the Minister for Energy. This statement reinforces TasNetworks' obligations to customers under national regulatory frameworks. It also notes that TasNetworks is expected, amongst other things, to[3]:

- deliver the lowest sustainable prices for regulated services to our customers;
- ensure an appropriately safe, reliable and secure electricity supply is provided for customers; and
- minimise operational and capital expenditure outlays through improved operational efficiency and asset management strategies.

Since the last Tasmanian distribution determination price review in 2012, we have worked hard to strengthen our asset management, risk management and expenditure governance frameworks, including as part of a merged network business from 1 July 2014. During the current regulatory control period, we have continued to develop our asset management capability through a five-step asset management process model focused on:

- gathering and synthesising accurate data on our assets and their condition;
- improving our analysis to support more efficient decision-making;
- prioritising our activities and producing efficient works programs that coordinate activities and optimise resources across reactive maintenance, routine maintenance and construction;
- managing the delivery of the work programs; and
- delivering the programs efficiently.

Our asset management processes and systems ensure that network risks and costs are analysed and optimised across network activities and programs including reliability assessment, network augmentation, customer connections, asset replacement, asset operation, and asset maintenance. In turn, the consideration of risks and costs underpins our forecasts of efficient operating and capital expenditure. A brief overview of our approach to expenditure forecasting and governance is provided below.

Our operating expenditure is forecast using a combination of bottom-up and top-down analysis, considering the efficient cost of activities to meet customer requirements and compliance obligations.

Our capital expenditure forecasting methodology comprises the following broad steps[4]:

- potential issues that may be addressed through a capital investment solution are identified. This process is referred to as 'investment need analysis', and it includes consideration of consumer preferences identified during consultation;
- a range of potential conceptual options are developed;
- technical and economic impacts, costs and benefits are analysed;

[3] Clause 4.2, paragraphs (i) to (iii).

[4] Note that not all steps are applicable to all capital expenditure investment types, and the specific detail of the methodology differs across the investment types.

- potential solutions, including non-network solutions and impacts are discussed with affected customers and customer feedback on preferences is sought;
- potential solutions including timing of implementation are developed, project cost estimates are produced and preferred solutions are selected on the basis of maximising net present value (where net market benefits can be quantified), or otherwise minimising total present value cost; and
- preferred solutions are confirmed as projects or programs of work, or contingent projects, with further customer consultation being undertaken where applicable.

In formulating our capital and operating expenditure budgets, projects in the capital works program and operating and maintenance work plan are considered together to optimise cost and timing. Specifically, we consider the interaction between our planned projects and programs of work, and we optimise the overall work program having regard to considerations including risk, overall cost, timing, and availability of cost effective resources. This optimisation may result in us combining some projects into programs of work, and determining the timing of work so that considerations of customer constraint costs, network availability, and delivery priority are balanced efficiently. It may also result in some projects or programs being reduced to ensure that customer, shareholder and business requirements are met. TasNetworks develops a long term expenditure forecast, to allow for the longer term pricing impacts on customers to be determined.

Our operating and capital expenditure forecasting, budgeting and delivery processes are supported by a Gated Investment Process Framework[5]. The framework ensures that TasNetworks' expenditure program is optimised and managed to achieve the most effective and efficient use of our capital and operating resources. The capital investment review team oversees the application of and compliance to the framework.

As noted in section 2, an integral element of our expenditure governance process is the work we undertake with our customers to ensure that their needs and priorities are reflected in our planning. We value the feedback we receive from our customers, and customer engagement as a key input to developing our expenditure forecasts. We are building on our experience to broaden our engagement with customers. Our approach to customer engagement continues to improve and ensuring we reflect the 'voice of the customer' in our decision making is a key business initiative.

We will provide full details of our asset management, associated risk management and expenditure governance frameworks in our Regulatory Proposal.

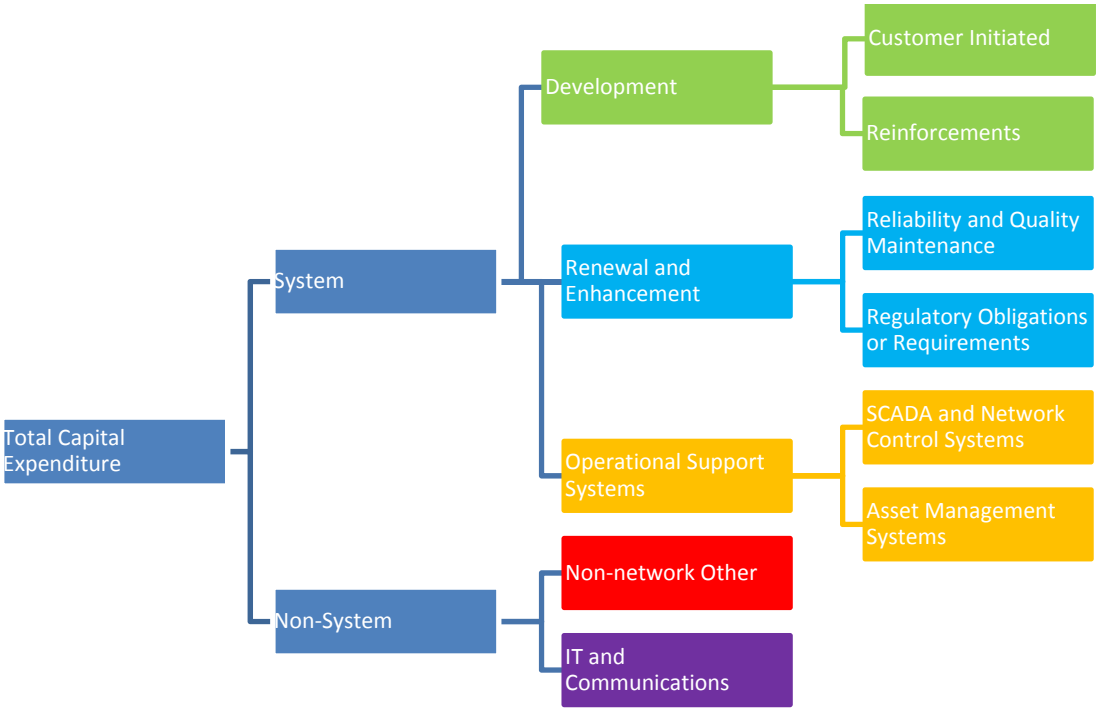
[5] TasNetworks Gated Investment Process Framework, 2014.

4 TasNetworks' capital expenditure forecasting methodology

4.1 Capital expenditure categories

The Rules require us to present our expenditure forecasts with reference to *well accepted categories of expenditure*[6]. As a practical matter, we also recognise that our forecasts should be presented in a manner that assists the AER in its review. In relation to capital expenditure, we have adopted a categorisation that is consistent with Regulatory Information Notice (RIN) categorisations adopted by the AER in recent distribution reviews, as shown in the figure below.

Figure 2.1 TasNetworks' capital expenditure categories



TasNetworks' total capital expenditure is derived by aggregating expenditure forecasts developed at the sub-category level. Sections 4.3 to 4.7 set out the methodology used to derive the forecast expenditure by sub-category. At each stage of the forecasting process we apply a 'top down' check to ensure that the forecast is reasonable. This validation process includes comparisons with historic expenditure and the application of the AER's 'Repex' and 'Augex' models to the Development and Renewal and Enhancement categories.

Before turning to this more detailed discussion, we first comment on the key drivers for capital expenditure in the Tasmanian distribution network.

4.2 Key drivers

Capital investment in the Tasmanian distribution system is driven by a range of factors, which can be broadly summarised as:

[6] As required by Schedule S6.1.1(1) of the Rules.

- new customer connections;
- the requirement to meet mandatory compliance obligations including technical, safety, physical security and environmental obligations;
- the requirement to meet reliability and quality of supply standards;
- managing the condition and reliability of assets, including network and Operational Support System assets;
- meeting the preferences expressed by our customers in terms of service standards and any trade-off between the price and standard of services; and
- the impact of load and distributed generation changes, including changes in generation patterns or changes in connection arrangements which require increases in the network capacity.

4.3 Development capital expenditure

The Development expenditure category includes Customer Initiated and Reinforcement categories.

4.3.1 Customer Initiated capital expenditure

This category consists of capital expenditure resulting directly from the connection of new customers to the distribution network, or changes to existing customer connections, where the associated activities are primarily due to meeting the specific requests of customers. We receive funding directly from some customers (up-front) towards their connection, in accordance with our customer connection policy.

4.3.1.1 Forecasting Methodology

Our forecasting methodology for Customer Initiated capital expenditure is summarised below:

Step 1 Forecast customer numbers by connection type:

- irrigation;
- commercial;
- residential; and
- subdivision.

Step 2 Identify current unit / project costs based on the cost of undertaking similar recent investments.

Step 3 Determine expenditure by multiplying volumes (programs of work and individual projects) in step 1 by unit costs in step 2.

Step 4 Validating the expenditure forecast by comparing our historical and forecast expenditure.

4.3.2 Reinforcement capital expenditure

This capital expenditure is associated with the construction of distribution network assets to ensure that the network has sufficient capacity to meet the electrical demand of TasNetworks' customers. TasNetworks' intention is to develop the network in a prudent manner to deliver an effective and efficient, least-cost, robust and reliable network.

Reinforcement expenditure relates to capital works that will ensure sufficient network capacity to deliver the following outcomes:

- compliance with regulatory obligations to meet reliability and quality of supply standards; and
- reliability and security of supply outcomes that meet customers' needs, by maintaining asset utilisation rates at appropriate levels, at the lowest whole of life cost.

If inadequate reinforcement (also referred to as 'augmentation') work is undertaken then, as demand grows, customers may face increased risk of load shedding or asset failure.

Power quality compliance is particularly challenging, partly due to the rapid increase in embedded generation. The management of power quality therefore requires specific capital investment, particularly for monitoring localised performance and upgrading feeders, transformers and voltage regulators where required.

4.3.2.1 Forecasting Method

Our forecasting method for Reinforcement capital expenditure comprises the following steps:

Step 1 Undertake network analysis and utilise consumer liaison input to identify areas with network capacity issues.

Prepare volume forecasts, comprising programs of work and individual projects.

In each case, the volume forecast is subject to a validation/benchmarking approach, which ensures that a top down assessment is applied. The validation process includes application of the AER's Augex model.

Step 2 Identify current unit / project costs based on the cost of undertaking similar recent investments.

Step 3 Determine expenditure by multiplying volumes (programs of work and individual projects) in step 1 by unit costs in step 2; or

Complete options analysis and project estimates for specific localised individual projects based on the cost of undertaking similar recent investments and/or design estimates. This enables a preferred solution and associated project estimate to be determined.

4.4 Renewal and Enhancement capital expenditure

This expenditure category includes expenditure for Reliability and Quality Maintainance and Regulatory Obligations and Requirements.

4.4.1 Reliability and Quality Maintainance capital expenditure

The key Reliability and Quality Maintainance expenditure drivers are:

- asset condition and risk;
- asset performance;
- spares availability and product support;
- technical obsolescence;
- compliance with regulatory compliance obligations relating to safety, network reliability and security, quality of supply and environmental performance; and
- physical security.

Reliability and Quality Maintainance expenditure is based on TasNetworks' operating environment, asset information, and the analysis undertaken as part of the asset management system. As noted in section 3, a key principle underlying the TasNetworks asset management system is to manage network assets by balancing cost, risk and performance in the delivery of a reliable and quality service to our customers.

To identify the potential need for network replacement investment we use our asset management system. Details of our asset management system are provided in our Strategic Asset Management Plan.

Risk is a principal driver of expenditure within the Reliability and Quality Maintainance category. Risk management approaches for each asset class are detailed in the specific overarching asset management plans. We have comprehensive condition assessment and performance monitoring regimes in place for selected asset classes that provide a detailed understanding of the condition and performance of our assets.

The availability of spare assets and parts, together with adequate product support from manufacturers has a significant impact on distribution system performance, particularly in the event of asset failure.

4.4.1.1 Forecasting Methodology

We apply a combination of bottom up and top down forecasting techniques, which vary depending on the asset class.

Step 1 Determine the forecast volume of work to meet requirements.

The volume forecast for replacement capital expenditure is derived and verified through the following methods:

(i) asset-specific condition assessment;

(ii) asset life and failure rate modelling;

(iii) trending of historical volumes;

(iv) reliability centred maintenance; and

(v) benchmarking/validation.

The choice of forecasting technique depends on the nature of the asset and the quality of available data. For example, for zone substation transformers, which are high cost, critical

assets, a more sophisticated forecasting technique is warranted. For other assets, such as service line replacements, historic trends are appropriate. The choice and application of forecasting technique also has regard to previous practice and the accuracy or otherwise of those forecasts.

In each case, we conduct a benchmarking/validation approach, which has regard to the historic volumes, benchmarking information, and where appropriate, the AER's repex model. In all cases, a 'bottom up' assessment is combined with a top down review to ensure that the forecasts are robust.

Programs of work that are required in order to address a compliance obligation are estimated separately.

Step 2 Determine the appropriate unit cost/ project costs, having regard to historic costs and expected changes over the forthcoming regulatory period.

Step 3 Determine expenditure by multiplying volumes in step 1 by unit costs in step 2. Or complete project estimates for specific individual projects and programs.

Step 4 Complete options analysis for projects and programs based on the cost of undertaking similar recent investments. This enables a preferred solution and associated project estimate to be determined.

4.4.2 Regulatory Obligations or Requirements capital expenditure

Regulatory Obligations or Requirements investment work programs are managed to ensure that we comply with all regulatory requirements, and maintain our electrical infrastructure to minimise the risks associated with failure or reduced performance of assets.

TasNetworks minimises the risk associated with the failure or reduced performance of assets by undertaking capital investments in the Regulatory Obligations or Requirements category.

The key Regulatory Obligations or Requirements investment needs that influence the performance of the distribution system are:

- safety and environmental performance and compliance;
- known modes of asset failure; and
- asset safety and environmental performance.

To identify the potential need for Regulatory Obligations or Requirements investment we use our asset management system. Details of our asset management system are provided in our Strategic Asset Management Plan.

4.4.2.1 Forecasting Method

We apply a combination of bottom up and top down forecasting techniques, which vary depending on the asset class:

Step 1 Determine the forecast volume of work to meet requirements.

The volume forecast for replacement capital expenditure is derived and verified through the following methods:

(i) asset-specific condition assessment;

(ii) asset life and failure rate modelling;

(iii) trending of historical volumes;

(iv) reliability centred maintenance; and

(v) benchmarking/validation.

The choice of forecasting technique depends on the nature of the asset and the quality of available data. For example, for zone substation transformers, which are high cost, critical assets, a more sophisticated forecasting technique is warranted. For other assets, such as service line replacements, historic trends are appropriate. The choice and application of forecasting technique also has regard to previous practice and the accuracy or otherwise of those forecasts.

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Programs of work that are required in order to address a compliance obligation are estimated separately.

Step 2 Determine the appropriate unit cost/ project costs, having regard to historic costs and expected changes over the forthcoming regulatory period.

Step 3 Determine expenditure by multiplying volumes in step 1 by unit costs in step 2. Or complete project estimates for specific individual projects and programs.

Step 4 Complete options analysis for projects and programs based on the cost of undertaking similar recent investments. This enables a preferred solution and associated project estimate to be determined.

4.5 Operational Support Systems capital expenditure

The Operational Support Systems expenditure category includes expenditure covering SCADA and Network Control Systems and Asset Management Systems.

4.5.1 SCADA and Network Control capital expenditure

SCADA and Network Control investment includes replacement, installation and maintenance of SCADA and Network Control hardware, software and associated IT systems. This includes costs associated with the provision of appropriate information gathering, information management and information analysis hardware, software and systems to allow TasNetworks to efficiently provide standard control services.

SCADA and Network Control categories include the systems that collect data for asset management purposes and provide the mainstay for monitoring and remote operation of the power network. Related SCADA and Network Control technologies include system-related telecommunications, operational systems, operational technology security and cyber security systems specific to the distribution network.

Network Control expenditure relates to protection and control assets that are critical to safety and network reliability maintenance. These assets monitor and operate plant, detect network faults and operate circuit breakers in substations and downstream distribution feeders. All these asset types have a natural physical life, as well as an economic and technological support life. Electronic microprocessors provide the basis for modern protection and control assets such as remote terminal units, relays, and reclosers, while older protection assets use electro-mechanical technologies.

Investment requirements for general and minor assets associated with this category are often driven by the economic life cycles, condition and performance of those assets. To identify the potential need for SCADA and network control investment we use our asset management system. Details of our asset management system are provided in our Strategic Asset Management Plan.

4.5.1.1 Forecasting Method

Our asset management plans and strategies inform the forecast scope of efficient SCADA and Network Control capital expenditure. We will manage the distribution system and supporting SCADA and Network Control assets to deliver operational and capital efficiency outcomes. We apply a bottom up and top down forecasting approach for SCADA and Network Control expenditure:

Step 1 To forecast SCADA and Network Control capital expenditure, we have regard to:

(i) life cycle refresh programs

Determine investment requirements based on the four to five year life cycle refresh programs having regard to:

- vendor and market support;
- security challenges;
- incident and problem data;
- current and prevailing technology standards; and
- cost versus the benefits of upgrade versus replacement.

This is recurrent expenditure:

(ii) non-recurrent expenditure

Determine whether new investment is warranted to address an identified business need. The resulting non-recurrent expenditure would need to be soundly based, with benefits clearly identified.

The sum of (i) and (ii) constitutes a 'bottom up' forecast. We validate this 'bottom up' forecast by applying a top down assessment by examining historic expenditure, including trends.

Step 2 Identify unit and project costs based on recent actual costs, verified by vendor quotes and market data where available.

Step 3 Test/validate the 'bottom up' capital expenditure, with reference to a top down assessment based on historic capital expenditure and trend analysis. Any increase in capital expenditure must be explained with reference to a specific driver or business case.

4.5.2 Asset Management Systems capital expenditure

Asset Management Systems investment includes replacement, installation and maintenance of relevant asset management business processes, business systems, and associated tools and software. This includes costs associated with the provision of appropriate asset information gathering, asset information management and asset information analysis applications to allow

TasNetworks to efficiently provide best appropriate practice asset management services.

Forward expenditure in Asset Management Systems partially reflects prudent deferral of some projects in the present regulatory period to derive synergies from systems developed as part of the TasNetworks merged networks business.

There is also investment in relevant systems to strengthen our asset condition and geographical information, enhance our risk management and asset analysis tools, renew our operational systems to extract the optimum capacity and life from our assets and to progress our smart distribution grid development program.

This category consists of capital expenditure associated with the provision of a number of related Asset Management Systems and services to the distribution customers that include:

- **Asset management information system –** the primary system that supports the strategic, tactical and lifecycle management of distribution network assets, including asset risk management, asset condition monitoring, asset performance management and outage management; and
- **Geographic Information Systems management** – these systems support the geographic representation of Distribution network and is the source of truth for the electrical connectivity model.

4.5.2.1 Forecasting Method

Our asset management policies, plans and strategies inform the forecast scope of efficient Asset Management Systems capital expenditure. We will use the Asset Management Systems to manage the distribution network assets to deliver operational and capital efficiency outcomes in line with best appropriate practices in asset management.

We apply a bottom up and top down forecasting approach for Asset Management Systems expenditure. In particular, we consider the recurrent or refresh costs, and also conduct a 'needs analysis'.

Step 1 To forecast operational support systems capital expenditure, we have regard to:

- life cycle refresh programs

Determine investment requirements having regard to:

- vendor and market support;
- collecting and integrating accurate data on our assets and their condition;
- incident and defect data;
- current and prevailing as well as future technology standards; and
- cost versus the benefits of upgrade versus replacement verses enhance.

This is recurrent expenditure:

- Non-recurrent expenditure

Determine whether new investment is warranted to address an identified business need. The resulting non-recurrent expenditure would need to be evidence based, with benefits clearly identified.

The sum of (i) and (ii) constitutes a 'bottom up' forecast. We validate this 'bottom

up' forecast by applying a top down assessment and examining historic expenditure, including trends.

Step 2 Identify unit and project costs based on recent actual costs, verified by external quotes and industry market data where available.

Step 3 Test/validate the 'bottom up' capital expenditure, with reference to a top down assessment based on historic capital expenditure and trend analysis. Any increase in capital expenditure must be explained with reference to a specific driver or business case.

4.6 Non-System – IT and Communications capital expenditure

This category consists of capital expenditure associated with the provision of information technology and communication services to the distribution customers, including:

- Stakeholder management – these systems support the provision of distribution services and information for our customers and stakeholders;
- Network management – systems supporting the management of distribution systems including responding to faults;
- Works management – these systems schedule and manage work programs and resources for network extensions, inspections, maintenance and construction;
- Information management – systems required to effectively manage large amounts of structured and unstructured information across the business; and
- IT management – this refers to IT capabilities enabling operations and supporting planning and management of the business, including managing applications, IT portfolio, infrastructure, architecture, security and IT services.

4.6.1 Forecasting Method

We adopt a similar approach to that described for SCADA and Network Control. In particular, we consider the recurrent or refresh costs, and also conduct a 'needs analysis'.

Step 1 To forecast IT and Communications capital expenditure, we have regard to:

(i) Life cycle refresh programs

Determine investment requirements based on the three year life cycle refresh program having regard to:

- age profile of current assets;
- planned variations in employee numbers;
- fault rates; and
- new and prevailing technology available at efficient cost.

For client device expenditure projects, which are a sub-set of recurrent expenditure, the following is used:

(ii) 'Needs analysis' and meeting customer expectations

Identify need for investment through internal business consultation, feedback from customers and other stakeholders regarding technological developments that could provide

performance and operational efficiencies.

This technique is used for all other IT investment including investment required to maintain IT infrastructure systems, including hardware and software and application capability at existing levels of performance as well as new infrastructure and / or applications required to deliver a different level of capability and / or service.

Step 2 Identify unit and project costs based on recent actual costs, verified by vendor quotes and market data where available.

Step 3 Validate the 'bottom up' capital expenditure, with reference to a top down assessment based on historic capital expenditure and trend analysis. Any increase in capital expenditure must be explained with reference to a specific driver or business case.

4.7 Non- System – Non-network Other capital expenditure

This expenditure category includes:

- Corporate IT and communications;
- Fleet;
- Land & Buildings; and
- other Capex (tools and equipment).

The key drivers for investment are asset age and condition, the business environment and corporate strategy. All expenditure is supported by a business case, including NPV and cost / benefit analysis and is approved in accordance with our gated investment framework.

4.7.1 Corporate IT and Communications

Corporate IT system and communication investment needs are determined in accordance with the priorities for information technology identified. This analysis provides the framework for determining the infrastructure, platforms, systems and computing equipment required to support the delivery of the network and improve the efficiency in providing business functions.

Investment requirements for non-network assets are largely non-network driven by the economic life cycles of those assets.

4.7.2 Fleet

Fleet expenditure needs are determined in accordance with the fleet management strategy and fleet capital program. The forecast is based on a bottom up view and top down approach from the business with regard to the replacement and investment needs in TasNetworks' vehicle fleet. The forecast is based on an assessment of the fleet's age and kilometres travelled,condition assessment of useful life, fleet size and resourcing requirements of the business.

4.7.3 Land and Buildings

The need for investment in Land and Buildings is based on the corporate facilities/property strategy. This plan identifies the land and property requirements to efficiently support the accommodation of staff (office and depot accommodation) and the overall property strategy. The property needs are aligned to the facility requirements to support the efficient delivery of services.

4.7.4 Other Capex (Tools and Equipment)

This category includes other capital investment requirements to support the network, such as expenditure on tools and equipment. Forecasts are based on a bottom up build based on historic levels of expenditure. This category includes the acquisition and replacement of hand held tools and safety equipment.

4.7.5 Forecasting Method

Our forecasting approach is described below:

Step 1 We apply historic expenditure and trends, adjusted to reflect the following drivers:

(i) Operational changes

Historical trends are not an appropriate forecasting method if there is a known change in our operational circumstances. For example, a business decision to buy rather than lease fleet vehicles will have implications for our capital expenditure forecasts, and an offsetting adjustment to operating expenditure.

(ii) Head-count

It is appropriate to take account of investment requirements that are driven by employee head-count, for example accommodation and office furniture costs.

Step 2 We validate the forecasts with reference to industry benchmarks where possible.

4.8 Key variables and assumptions

The following are key variables and assumptions that are expected to underpin our capital expenditure forecasts:

- we will assess the demand forecasts, together with existing and forecast generation sources to identify emerging issues in the distribution system;
- we will meet our compliance obligations, including those relating to reliability requirements, physical security, safety, environment and other matters. The impact of known regulatory changes on our future capital expenditure requirements will be reflected in the expenditure forecasts;
- our investment evaluation is supported by well-documented project and program scopes and good estimating practices that reflect efficient costs and therefore provide a reasonable basis for projecting future capital expenditure costs;
- we will apply an estimate of forecast labour and non-labour escalation rates and inflation for the forthcoming regulatory control period;
- we will provide a forecast productivity improvement factor and cost savings which assume that our operating environment, including external factors beyond our control, will be conducive to achieving the anticipated improvements; and
- we may undertake further refinement of the forecast volumes and costs at the category level if the consolidated forecast (or the price/service outcomes flowing from the forecast) is inconsistent with customer, corporate, workforce capability or regulatory expectations.

A number of these assumptions are discussed further below.

4.8.1 Forecast Demand and Generation

Some network development needs and the optimal timing of solutions are sensitive to rates of load growth in different areas of Tasmania. TasNetworks and the Australian Energy Market Operator (AEMO) undertake load forecasts, and given the inherent uncertainty of forecasting a range of variables into the future, there is some divergence in these forecasts.

We work with our customers and AEMO to understand inputs and assumptions to predict future load across the state. We assess the sensitivity of our capital program to variations in load forecasts and we will provide a probability weighted forecast of distribution projects affected by different peak demand forecasts.

We consider the impact of new generation sources, including the increase in embedded generation, in assessing local demand and any emerging network issues.

4.8.2 Compliance obligations

We must meet a range of compliance obligations. In particular, our Regulatory Proposal will be based on a works program planned to meet the requirements specified in the Rules and Tasmanian electricity supply industry law and regulations.

4.8.3 Investment evaluation summaries

We prepare investment evaluation summaries; including scopes and supporting information for each program and project included in the future capital expenditure works program, to allow estimation of future project costs. The scopes and unit prices / or estimates are based on historical data and reasonable assumptions about future requirements, given the best information available to us at the time.

4.8.4 Real Cost Escalators

We will escalate our expenditure forecasts for labour, materials and contractor costs to reflect the expected real change in costs over the regulatory control period. The real cost escalators will be determined based on market data and economic analysis. TasNetworks expects to engage external technical experts to provide advice in relation to appropriate escalation rates to ensure the rates applied are reasonable.

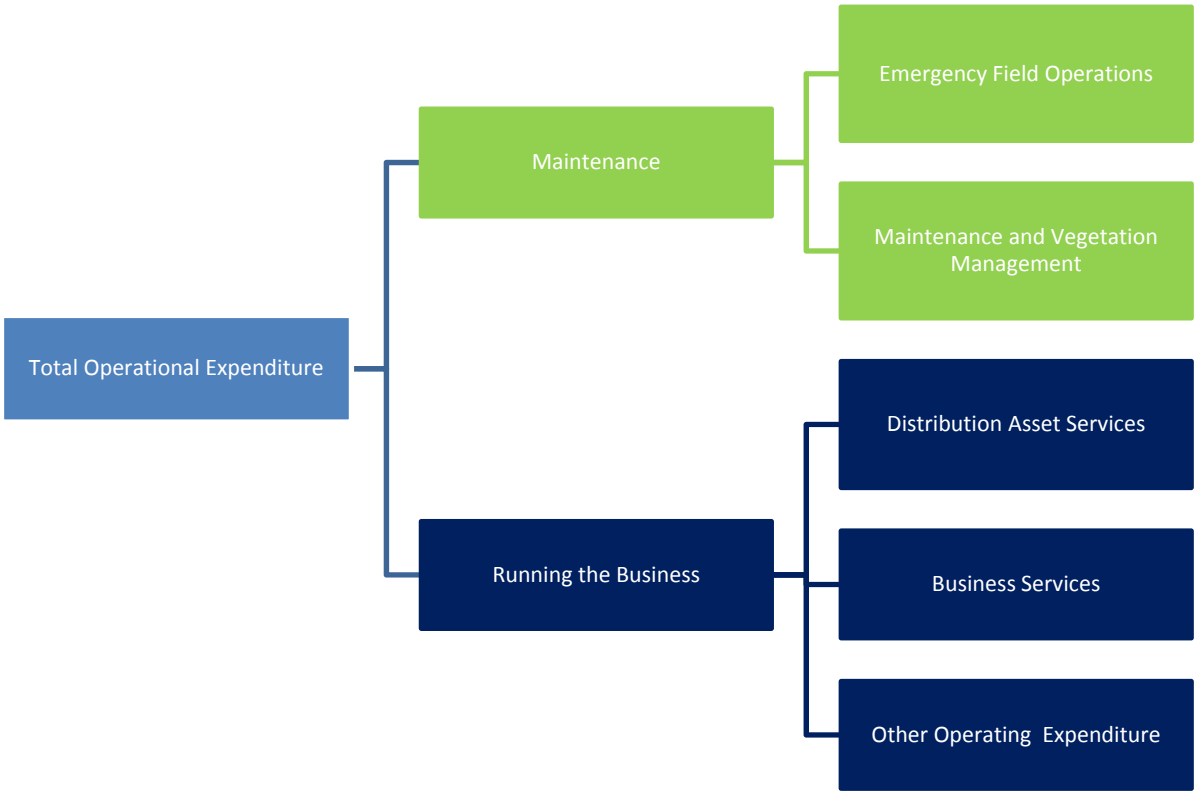
4.8.5 Forecast productivity improvement factor and cost savings

Our forecast will reflect the expected capital expenditure efficiency gains arising from, amongst other things, the formation of TasNetworks. Details of these expected gains will be provided in our Regulatory Proposal.

5 TasNetworks' operating expenditure forecasting methodology

As noted in relation to capital expenditure, our operating expenditure forecasts will be presented by reference to well accepted categories[7], as illustrated in the figure below.

Figure 3.1 TasNetworks' operating expenditure categories



5.1 Overview of operating expenditure forecasting methodology

In broad terms, our operating expenditure forecasting methodology will follow the base-step-trend approach adopted by the AER in its recent revenue cap decisions.

Under the operating expenditure forecasting methodology:

- the audited 2014–15 total standard control services operating expenditure will be used as a starting point for projecting future recurrent operating expenditure requirements; and
- certain operating expenditure items - referred to here as "Other" operating expenditure - will be forecast separately and included in the total operating expenditure forecast.

The methodology comprises the following three steps.

[7] In accordance with schedule S6.1.2(1) of the Rules.

Step 1 Derive the recurrent operating expenditure forecast as follows:

(a) commence with actual standard control services operating costs for the 2014–15 base-year;

(b) deduct:

(i) non-recurrent operating expenditure items;

(ii) any other categories of expenditure which are not reflective of future expenditure requirements and should therefore be subject to a zero-based (bottom-up) forecast; and

(iii) the actual costs of the "Other" operating expenditure items that are to be subject to separate forecasts in Step 2.

(c) add the forecast cost of scope changes in the years that such expenditure is expected to be required;

(d) scale up the sub-total annually by using applicable growth factors which reflect the increase in operating expenditure requirements driven by growth of the business;

(e) add to that scaled-up sub-total the forecast non-recurrent operating expenditure for items (i) and (ii) deducted in step (b). These forecasts are to be derived using zero-based cost estimates for each year of the forthcoming period;

(f) scale up the total obtained in step (e) annually by using applicable labour and non-labour escalation factors to derive the unadjusted forecast of operating expenditure for the forthcoming regulatory period; and

(g) reduce the total obtained in step (f) by an annual productivity target to derive the productivity-adjusted forecast of total operating expenditure, including synergy benefits from the merger of Transend and Aurora's network businesses for the forthcoming regulatory period.

Step 2 Derive the "Other" operating expenditure forecast as follows:

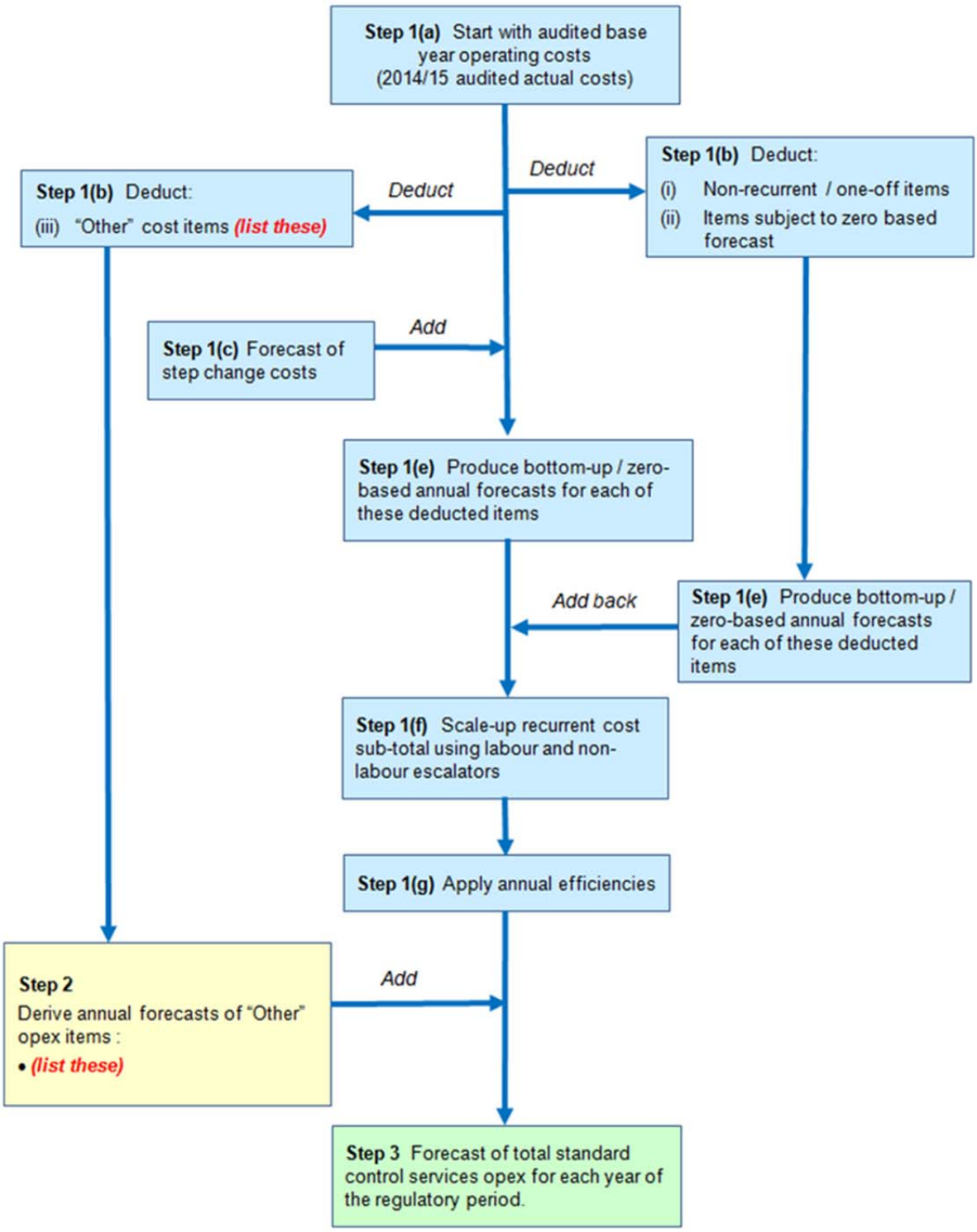
Forecasts of each of the "Other" elements will be developed by adopting a separate forecasting approach, appropriate for each element.

Step 3 Derive the standard control services operating expenditure forecast as follows:

Recurrent operating expenditure and "Other" operating expenditure annual forecasts will be summed to provide the total operating cost forecast for each year of the forthcoming regulatory period.

A pictorial overview of the development of TasNetworks' forecast operating expenditure using the forecasting methodology is illustrated in Figure 3.2.

Figure 3.2 TasNetworks' proposed operating expenditure forecasting methodology



5.2 Key variables and assumptions

The following are key variables and assumptions that are expected to underpin our operating expenditure forecasts:

- TasNetworks will provide evidence to demonstrate that 2014–15 base-year costs are efficient, and therefore provide a reasonable basis for projecting future operating expenditure requirements;
- TasNetworks will assess the cost impact of asset growth on operating expenditure, and the assessed growth factor will be applied;
- TasNetworks will provide an estimate of labour and non-labour operating expenditure input escalation rates for the forthcoming regulatory control period;
- TasNetworks will provide a forecast productivity improvement factor and cost efficiencies, which assume that TasNetworks' operating environment, including external factors beyond TasNetworks' control, will be conducive to achieving the anticipated improvements;
- TasNetworks' asset management plans and strategies provide a key input that drives the forecast scope of field operations and maintenance expenditure; and
- the impact of known regulatory changes, such as the requirements for a new Tariff Structure Statement, on TasNetworks' future operating expenditure requirements will be reflected in the expenditure forecasts.

Further information on the efficient base year, asset growth scaling factors and labour and non-labour escalation rates is provided below.

5.2.1 Efficient base year

The 2014–15 financial year will be the base year for determining the recurrent expenditure component of the operating expenditure forecast. This will be the most recent financial year for which audited financial accounts are available.

It is instructive to benchmark our operating expenditure against our own past performance and our peers. We expect that benchmarking studies will support the view that our 2014–15 financial year is an appropriate basis from which to forecast operating expenditure. In addition, we will have regard to the AER's recent decisions for other distributors, which examined the efficiency of the base year expenditure. Our objective is to ensure that our proposed base year expenditure is accepted by the AER as efficient.

5.2.2 Asset growth scaling factors

It is appropriate for TasNetworks' operating expenditure forecast to take into account the cost impact of a growing distribution system. In broad terms an increase in the size of TasNetworks' network creates a growing demand for operating and maintenance services. Given the requirements of clause 6.5.6(c)(3) of the Rules, it is important to take account of the increase in the network when developing TasNetworks' operating expenditure forecast.

As noted in recent AER decisions, asset growth does not result in a one-for-one increase in operating expenditure. This is because network businesses are able to realise the benefits of economies of scale, where marginal costs are lower than average costs. The extent of scale economies differs across expenditure categories. TasNetworks will use available evidence, along with our experience and judgement in developing estimates of the growth scaling factors for each expenditure category.

5.2.3 Labour and non-labour escalation rates

5.2.3.1 Labour escalation

Labour costs have a significant influence on TasNetworks' operating expenditure. TasNetworks will engage an independent economic forecaster to provide forecasts of real unit labour cost movements for the purpose of preparing the Regulatory Proposal.

5.2.3.2 Non-labour escalation

Non labour operating components may be assumed to increase in line with the CPI. However, this matter will be considered further in the Regulatory Proposal.

5.3 Forecasting step changes

Forecasts of costs associated with step changes will be prepared on a bottom-up basis. Consistent with the AER's preferred approach, TasNetworks will only propose step changes if additional opex is required in order to:

- comply with a new or changed regulatory obligation, which represents an increase in scope; or
- deliver an efficient opex/capex trade-off, which provides a more efficient mix of inputs.

5.4 Top-down assessment of total forecast

We will apply a top-down assessment of the total opex forecast obtained using the methodology outlined in section 5.1. The purpose of the assessment will be to test and verify that the forecast reasonably reflects:

- the efficient costs of achieving the operating expenditure objectives set out in clause 6.5.6(a) of the Rules;
- the costs that a prudent operator would require to achieve the operating expenditure objectives; and
- a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

We expect to apply benchmarking in our top-down assessment of the total operating expenditure forecast.

6 Closing comments

This document has provided an overview of the methodologies that we propose to use to prepare the forecasts of our operating and capital expenditure that will form part of our Regulatory Proposal for the regulatory control period commencing on 1 July 2017. This document was prepared in accordance with clause 6.8.1A of the Rules.

We consider that the forecasting methodologies set out in this submission will deliver expenditure forecasts that comply with the Rules requirements and provide a reasonable forecast of efficient costs to operate and maintain Tasmania's distribution system. Our Regulatory Proposal will set out expenditure forecasts based on these methodologies.

We welcome feedback on these methodologies from any interested party.