Forecast Expenditure Summary

System Operational Expenditure

2015 to 2020

ERGON ENERGY

Contents

1. About this summary document

This section explains the purpose and structure of this summary document.

1.1 Purpose

The purpose of this summary document is to explain and justify Ergon Energy's network operating and maintenance expenditure (system operating expenditure) for its standard control services (SCS) and alternative control services (ACS) for the previous (1 July 2005 to 30 June 2010) and current (1 July 2010 to 30 June 2015) regulatory control periods. The document will also support its forecasts for the next regulatory control period (1 July 2015 to 30 June 2020). It will do this by:

- explaining and validating the outcomes in the current and previous regulatory control periods;
- explaining recent trends in system operating expenditure and outcomes for network operating and maintenance activities compared to forecasts
- outlining the required system operating expenditure for Ergon Energy to maintain the reliability, safety, and security of the distribution system; and
- outlining the system operating expenditure forecasts for the next period on a category-by-category basis.

It aims to provide the reader with a full understanding of Ergon Energy's system operating expenditure, against what was allowed, within the Queensland Competition Authority (QCA) and Australian Energy Regulator (AER) Determinations. As a summary document, it necessarily addresses some matters at a relatively high level and refers to other documents for further detail.

This summary document provides details of actual and estimated system operating expenditure for the previous, current, and next regulatory control periods. All system operating expenditure presented in this document is in real 2014-15 dollars, except where otherwise stated.

Importantly, this summary document only explains and justifies Ergon Energy's direct costs for its operating expenditure. Ergon Energy applies real cost escalations and shared costs (overheads) to these direct costs to determine its total operating expenditure. Ergon Energy has prepared, and provided to the AER, separate documents that explain and justify – for all of its operating expenditure categories – how it applies these real cost escalations and shared costs (overheads).

Readers should take care in examining the (unescalated) direct costs in this summary document to ensure that they do not confuse them with

- Direct costs, inclusive of real cost escalations.
- Total costs, inclusive of direct costs, real cost escalations and shared costs (overheads).

This document should be read in conjunction with the 'Forecast Expenditure Summary – Operating Costs', which outlines and justifies Ergon Energy's operating expenditure forecasting methodology, i.e. predominantly the Base-Step-Trend approach, and its forecast operating expenditure. The purpose of this document is to describe Ergon Energy's forecast system operating expenditure on a category-by-category basis for the next period.

Figure 1 below displays the categories that comprise Ergon Energy's operating expenditure forecast: System Maintenance, Network Operations and the Demand Management portion of Other Costs.

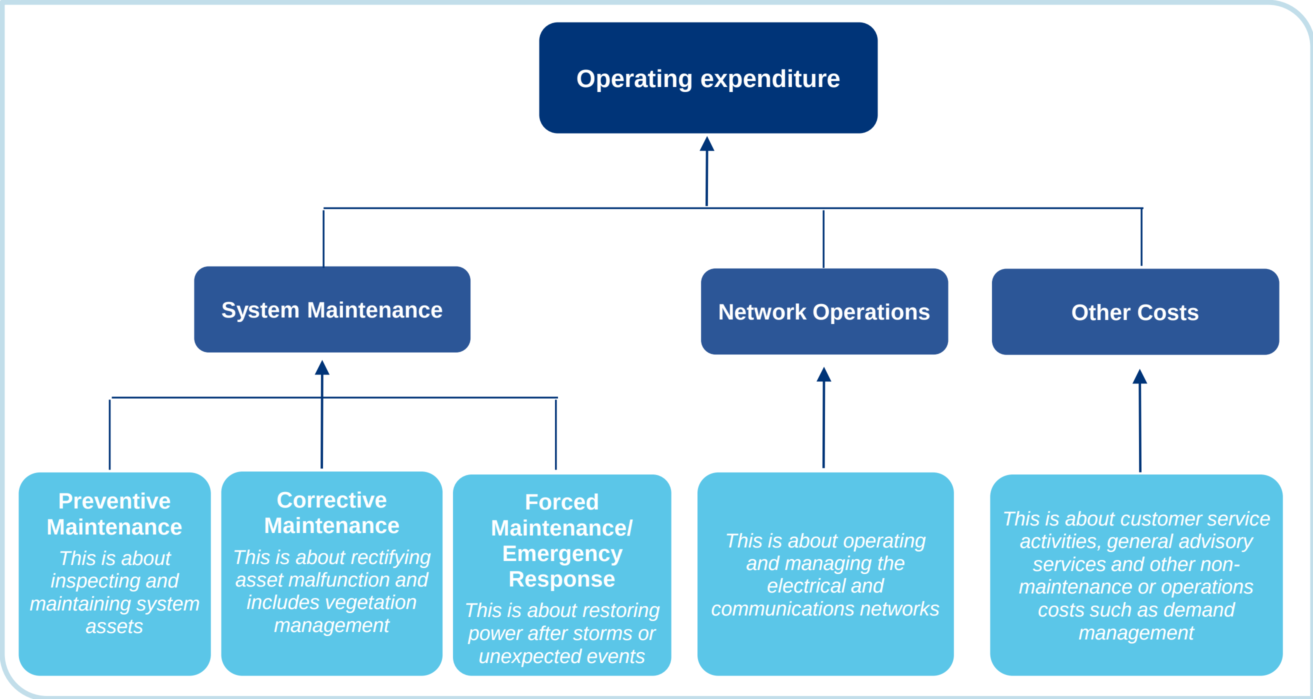

Figure 1: Operating expenditure categories

1.2 Structure

The structure of this summary document is as follows:

- Section 2 details Ergon Energy's system operating expenditure for the previous, current, and next regulatory control periods. This is intended to provide the reader, at the outset, with a clear view of the profile of Ergon Energy's actual and estimated system operating expenditure, which will be explained and justified in the remainder of this summary document.
- Section 3 describes the conceptual nature of Ergon Energy's system operating expenditure. It explains why it is necessary, with regard to Ergon Energy's legislative and regulatory obligations.
- Section 4 examines why Ergon Energy's system operating expenditure in the current regulatory period differed from the forecasts that it presented to the AER in its regulatory proposal, and revised regulatory proposal, as well as the AER's own system operating expenditure allowance in its distribution determination.
- Section 5 outlines Ergon Energy's expenditure forecasting methodology for its system operating expenditure forecast for the next regulatory control period.
- Section 6 details Ergon Energy's proposed system operating expenditure forecast for the next regulatory period. It also details the network, risk, and customer outcomes associated with this forecast.
- Section 7 draws on the material in the previous sections to explain and justify Ergon Energy's forecast system operating expenditure against the operating expenditure objectives, criteria and factors in clause 6.5.6 of the National Electricity Rules (NER). It therefore outlines why the AER should approve this operating expenditure forecast as part of its distribution determination for Ergon Energy in the next regulatory period.

2. Expenditure profile

This section details Ergon Energy's system operating expenditure for the previous, current, and next control regulatory periods. This is intended to provide the reader up-front with a clear view of the profile of Ergon Energy's actual and estimated system operating expenditure that will be explained and justified in the remainder of this summary document.

2.1 Direct costs

Table 1 details the following information about Ergon Energy's system operating expenditure, in direct costs, for the previous, current, and next regulatory control periods:

- The system operating expenditure forecast that Ergon Energy presented in its regulatory proposals, and revised regulatory proposals, to the QCA for the previous regulatory control period and to the AER for the current regulatory control period.
- The QCA's and the AER's system operating expenditure allowance for the previous and current regulatory control periods respectively.
- Ergon Energy's actual and estimated system operating expenditure for the previous and current regulatory control periods.
- The SCS and ACS operating expenditure forecast that Ergon Energy is now presenting in its regulatory proposal to the AER for the next regulatory control period 2015 to 2020.

All costs have been converted into real 2014-15 dollars[1].

[1] Indexation is based on the Australian Bureau of Statistics Series 6401.0 Consumer Price Index Weighted Average of Eight Capital Cities, All Groups CPI.

Table 1: Standard Control Services and Alternative Control Services System operating expenditure (direct costs, 2014-15 real dollars million[2])

Regulatory Review process	2005-06	2006-07	2007-08	2008-09	2009-10	Total	2010-11	2011-12	2012-13	2013-14	2014-15	Total	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Regulatory Proposal	199	190	197	190	193	**969**	315	330	335	340	336	**1,655**[3]	223	225	228	231	234	**1,140**[4]
Revised Regulatory Proposal	245	235	244	220	222	**1166**	316	332	335	339	337	**1,659**[5]	N/A	N/A	N/A	N/A	N/A	**N/A**
QCA/AER Determination	181	168	203	202	208	**962**	237	247	256	243	239	**1,221**[6]	N/A	N/A	N/A	N/A	N/A	**N/A**
Actual/Estimate	181	177	203	199	202	**962**	242[7]	254	232	205	209[8]	**1,142**	N/A	N/A	N/A	N/A	N/A	**N/A**
Variance – Actual v Determination	**0%**	**5%**	**0%**	**-1%**	**-3%**	**0%**	**2%**	**3%**	**-9%**	**-16%**	**-13%**	**-6%**	N/A	N/A	N/A	N/A	N/A	**N/A**
Expenditure by category:																		
Network Operations	13	21	25	24	23	**106**	26	26	24	23	23	**122**	24	25	25	25	26	**125**
Vegetation Management	62	59	68	62	62	**313**	60	74	50	47	53	**285**	49	50	50	51	52	**252**
Maintenance	87	80	75	79	72	**393**	81	99	99	82	88	**449**	91	92	93	94	96	**467**
Emergency Response	19	17	35	34	45	**150**	71	44	50	47	41	**253**	46	47	47	47	48	**235**
Demand Management	0	0	0	0	0	**0**	4	10	8	6	5	**34**	12	12	12	12	13	**61**

[2] Indexation based on Australian Bureau of Statistics Series 6401.0 Consumer Price Index Weighted Average of Eight Capital Cities, All Groups CPI.

[3] Regulatory Proposal to AER – Distribution Services for period – 1 July 2010 to 30 June 2015 – 1 July 2009, Page 31, Table 7 (and converted into direct costs).

[4] Operating Expenditure Base Step Trend model.

[5] Revised Regulatory Proposal to AER – Distribution Services for period – 1st July 2010 to 30 June 2015 – 14 Jan 2010, Page 13, Table 1-2 (and converted as above).

[6] AER Final decision, Queensland distribution determination 2010-11 to 2014-15, Page xxv, Table 13 (allocated by Ergon Energy into the operating expenditure categories and converted as above).

[7] 2010-11 to 2013-14 Ergon Energy Regulated Business Contribution Reports (converted into direct costs by removing overheads in proportion to the total costs and in accordance with the CAM).

[8] FY15 budget set out in 2014-15 Ergon Energy Regulated Business Contribution Report (and converted as above).

Table 1 shows that over the 2005-10 regulatory control period, Ergon Energy met its allowance for system operating expenditure. Items of note in the analysis of this period were:

- Significant weather events led to a re-prioritisation of resources and expenditure. For example in March 2006 Cyclone Larry (Larry) crossed the North Tropical Coast near Innisfail. Rainfall associated with Larry resulted in flooding in the Mulgrave, Russell, Tully, Murray, and Herbert Rivers, and in the Flinders, Nicholson, and Leichhardt Rivers. Cyclone recovery works resulted in emergency response costs almost doubling, from $19 million in 2005-06, to $35 million in 2007-08, and increasing to $45 million in 2009-10.
- A reduction in maintenance costs of $15 million per annum by the end of the regulatory control period partially offset this. During the period, Ergon Energy implemented a major asset inspection regime to change the focus of its maintenance program from reactive to preventive. This improved efficiencies as the period continued.
- Ergon Energy also experienced an 80% increase in network operating costs through transitioning from six regional corporations into one. Ergon Energy had to build new asset data systems and to re-populate these with reliable data after inheriting from the previous businesses varied sets of data and systems for recording asset information.

For the 2010-15 regulatory control period, the AER's allowance for system operating expenditure increased by $259 million. Largely, this was driven by:

- The introduction of new inspection programs across all asset equipment types.
- Preventive maintenance inspections for meters, distribution services, underground cables and joints, vegetation and access track scoping work, outdoor switchyards, communications, and protection.
- Increases in corrective maintenance as identified through preventive inspections.
- A review of vegetation management programs to provide more comprehensive and efficient vegetation management. Additionally to clear a backlog of vegetation during transition to the new strategy there was further work identified. This included work on the access track program introduced in the current regulatory control period.
- Conversely, the AER directed Ergon Energy to remove any forecast for significant weather events and made further reductions to the revised proposal on the basis of increased preventive and corrective maintenance and the possibility of 'pass through' application for major events.

For the period 2010-15, Ergon Energy is forecast to underspend its allowance by $79 million, or approximately 6%. Ergon Energy embarked on a number of initiatives during the regulatory period including:

- a partnership with Energex to implement a joint asset management framework
- a risk assessed review of all maintenance programs to ensure prudent investment
- recovery programs for Asset Inspection (poles) and Vegetation Management to return both to maintenance cycles
- more effective and efficient contracting models for ACS Streetlight Maintenance, Asset Inspection and Vegetation Management
- the introduction of Remote Observation Automated Modelling Economic Simulation (ROAMES) into maintenance programs.

The net result of the above was a reduction of $152 million.

Ergon Energy also incurred expenditure to respond to emergencies of approximately $50 million due to significant weather events (i.e. cyclones and major floods) that were excluded from the Determination.

Ergon Energy forecasts a further reduction of $2 million or 0.1% for the 2015-20 regulatory control period compared with its actual and estimated expenditure in the current period. The principal drivers for this are:

- A $33 million reduction in vegetation management costs through further integration of ROAMES and progressively more efficient contracting arrangements.
- The vegetation and asset inspection (poles) programs returns to a maintenance cycle, with backlog programs complete and program delivery reaching sustainable levels.
- An $18 million increase in maintenance to remediate contaminated land on Ergon Energy sites and respond to the increase in communications infrastructure associated with the continued development of a smart network.
- An $18 million reduction in emergency management costs based on the introduction of parametric insurance cover for major weather events.
- A $24 million increase in demand management representing the operating expenditure requirements to alleviate total capital expenditure in some areas, and implement more effective, non-traditional capital expenditure solutions in others to customer demand and safety net requirements.

2.2 Total costs

Table 2 below provides the same information as is in Table 1 above, but instead of presenting the operating expenditure in direct costs, it presents it in total costs (i.e. inclusive of real cost escalations and shared costs (overheads)).

Table 2: Standard Control Services and Alternative Control Services System operating expenditure (total costs, 2014-15 real dollars million[9])

Regulatory Review process	2005 -06	2006 -07	2007 -08	2008 -09	2009 -10	Total	2010 -11	2011 -12	2012 -13	2013 -14	2014 -15	Total	2015 -16	2016 -17	2017 -18	2018 -19	2019 -20	Total
Regulatory Proposal	287	292	292	283	289	**1,443**	418	431	436	437	424	**2,146**[10]	308	314	328	338	344	**1,632**[11]
Revised Regulatory Proposal	353	361	361	329	333	**1,737**	417	434	435	434	422	**2,141**[12]	N/A	N/A	N/A	N/A	N/A	N/A
QCA/AER Determination	261	258	300	302	312	**1,433**	345	367	364	356	341	**1,774**[13]	N/A	N/A	N/A	N/A	N/A	N/A
Actual/Estimate	271	264	306	300	303	**1,444**	357[14]	380	332	305	303[15]	**1,677**	N/A	N/A	N/A	N/A	N/A	N/A
Variance – Actual v Determination	**4%**	**2%**	**2%**	**-1%**	**-3%**	1%	**3%**	**4%**	**-9%**	**-14%**	**-11%**	**-5%**	N/A	N/A	N/A	N/A	N/A	N/A
Expenditure by category:																		
Network Operations	20	31	38	36	35	**160**	38	39	35	35	33	**181**	34	35	37	38	38	**182**
Vegetation Management	92	88	102	93	92	**467**	90	113	73	71	77	**423**	69	70	74	76	78	**367**
Maintenance	131	120	113	119	108	**591**	120	151	143	123	128	**665**	128	131	137	141	143	**679**
Emergency Response	28	25	53	52	68	**226**	105	67	73	70	59	**375**	65	66	69	71	72	**342**
Demand Management	0	0	0	0	0	**0**	4	10	8	6	5	**34**	12	12	12	12	13	**61**

9 Indexation based on Australian Bureau of Statistics Series 6401.0 Consumer Price Index Weighted Average of Eight Capital Cities, All Groups CPI.

10 Regulatory Proposal to AER – Distribution Services for period – 1st July 2010 to 30th June 2015 – 1st July 2009, Page 31, Table 7.

11 Operating Expenditure Base Step Trend model.

12 Revised Regulatory Proposal to AER – Distribution Services for period –1st July 2010 to 30th June 2015 –14th Jan 2010, Page 13, Table 1-2.

13 AER Final decision Queensland distribution determination 2010-11 to 2014-15, Page xxv, Table 13 (allocated by Ergon Energy into the operating expenditure categories).

14 2010-11 to 2013-14 Ergon Energy Regulated Business Contribution Reports. Demand Management does not attract overheads so its direct and total costs are equal.

15 FY15 budget set out in 2014-15 Ergon Energy Regulated Business Contribution Report. Demand Management does not attract overheads so its direct and total costs are equal.

3. Nature of expenditure

This section describes the conceptual nature of Ergon Energy's SCS and ACS system operating expenditure regulatory obligations.

System operating expenditure is driven by Ergon Energy's customer commitments, which are supported by regulatory and statutory requirements, codes of works and industry standards. The content of the system operating expenditure program balances these requirements within the proposed funding through:

- complying with all applicable regulatory obligations or requirements
- maintaining the reliability, safety, and security of the distribution system
- managing the forecast demand for Standard Control Services reviewing cost and risk.

The community and stakeholders expect Ergon Energy to manage its assets to ensure the provision of a safe and reliable system of energy supply. All operating and maintenance programs are implemented to assist in achieving this through targeted operating, inspection, maintenance, and remediation activities that meet legislative, industry standard and code, manufacturer recommendation and industry best practice requirements.

3.1 Legislative requirements

The Queensland *Work Health and Safety Act 2011* requires Ergon Energy to:

> *ensure, so far as is reasonably practicable, that the fixtures, fittings and plant are without risks to the health and safety of any person.*[16]

Under the Queensland *Electrical Safety Act 2002*, Ergon Energy:

> *has a duty to ensure that its works*
>
> *(a) are electrically safe*
>
> (b) *are operated in a way that is electrically safe.*[17]

Further, the Queensland *Electricity Safety Act 2002* requires Ergon Energy to:

> *inspect, test and maintain the works.*

Both Acts and Regulation define what is 'reasonably practical' for Ergon Energy to do to meet its safety obligations.[18] The effect of these definitions is to require suitably knowledgeable persons to assess the relevant hazards or risks, and to eliminate or mitigate the risks having regard, for amongst other things, whether the associated costs of doing so are 'grossly disproportionate' to the risks.[19]

The Acts do not provide significant assistance to define the meaning of 'grossly disproportionate'. However, the 'value of statistical life' is used frequently to estimate the benefits of reducing the risk of death. Society places this estimated financial value on reducing the average number of deaths by one. The Australian Government's Office of Best Practice Regulation has issued a

[16] Section 21(2) of Queensland Work Health and Safety Act 2002

[17] Section 29(1) of Queensland Electrical Safety Act 2002

[18] Part 9 (195 to 216) Queensland Electrical Regulation 2013

[19] Section 18 of Queensland Work Health and Safety Act and section 28 of Queensland Electrical Safety Act 2002

'Best Practice Regulation Guidance Note'[20] that estimated the 'value of statistical life at $3.75 million in 2007. Adjusted for CPI, this equates to approximately $4.5 million in 2014.

3.2 General philosophical approach to SCS operating expenditure

The system operating expenditure requirements are based on the three foundation pillars: Compliance, Maintain, and Manage as described earlier in this section. Within the higher-level components, specific programs directly target safety in particular asset (pole) inspection, pole-top inspection, earth testing, line patrols, protection scheme testing and review, conductor height compliance (using ROAMES) and vegetation management. Inspection and maintenance programs are supplemented by process and funding to ensure the remediation of any defects, to support the business in meeting reliability targets.

Ergon Energy will satisfy stakeholder needs and requirements by proposing an operating expenditure program that is sustainable in the long term, and that incorporates additional future efficiency gains. This is particularly important in eliminating annual fluctuations, peaks and troughs, in costs and resources, to present a program with predictability for resourcing and risk mitigation. Long-term resource planning for both internal and external workforces is possible and in turn leads to better resource cost structures to deliver the plan.

The alignment of Ergon Energy's forecast operating expenditure to Ergon Energy's strategic goals is through applying Ergon Energy's customer commitments as the input drivers to the baseline plan. Table 3 below demonstrates this alignment with customer commitments.

Table 3: Strategic alignment of Ergon Energy's forecast operating expenditure

Customer Commitment	Plan Component	Contribution
Peace of mind	Network operations	Safely monitor and operate the network
	Vegetation Management	Maintain safety and security of the network
	Maintenance	Maintain safety and security of the network
	Emergency Response	Response to unexpected or unplanned events
Best possible price	Network Operators	New technology
	Vegetation Management	Efficient provision of Standard Control Services
	Maintenance	Efficient provision of Standard Control Services
		Maintain supply reliability
Choice and control	Network Operators	Smart network
		Integrate IES solutions
	Maintenance	Prepare for retail choice (metering)
		Smart network (communications)
	Demand management	Integrate IES solutions

[20] Australian Government, Department of Finance and Deregulation, Office of Best Practice Regulation, *Best Practice Regulation Guidance Note – Value of a Statistical Life*, November 2008.

A continuous improvement process is applied across all programs by analysing inspections versus defects, operational effectiveness and cost offsets (operating expenditure and capital expenditure), leveraging off the drivers of reducing cost, and maintaining safety and reliability. This ensures that Ergon Energy is both a prudent and an efficient distribution network service provider.

The maintenance of existing system assets represents the largest component of Ergon Energy's system operating expenditure. Ergon Energy's approach to asset renewal capital expenditure is analogous to the 'grandfather's axe' renewal philosophy – replacing components as needed to maintain the asset's functional performance. The primary focus is to maintain intended or expected service performance, and to improve performance only where external safety obligations mandate this.

All assets have the potential to fail in service. Ergon Energy has adopted a risk management approach to managing asset failures that is consistent with Queensland legislation and good asset management practice:

- Asset failures assessed to have high cost or high consequences on service outcomes are managed proactively through a program of inspection, testing, corrective maintenance, and eventual proactive replacement at end of their economic life. Applying this proactive approach aims to prevent or mitigate the consequences of asset failures, such as dangerous electrical events,[21] extended customer outages or reduced asset functionality, to tolerable levels.
- Asset failures assessed to have low cost and low consequences on service outcomes are allowed to run to failure. Assessment of impacts will consider contingency plans and alternative service delivery strategies, such as the use of local or mobile generation and load transfer.

Ergon Energy's risk management approach recognises that for high cost high consequence failure assets, intrusive maintenance is relatively expensive, and that non-intrusive condition monitoring and testing, collecting data, analysing and reacting proactively will achieve lifecycle cost reductions. For low cost low consequence failure assets, routine maintenance and/or obtaining and maintaining condition data are relatively expensive, and not cost effective to pursue.

Finding the optimum balance between proactive and reactive asset renewal is not straightforward and varies for each asset class over time. Ergon Energy actively seeks to identify the right balance in order to support prudent operating expenditure.

3.3 Categorisation of expenditure

The following section breaks down Ergon Energy's system operating expenditure into:

- Network operations
- Vegetation management
- Maintenance
- Demand Management
- Emergency Response

[21] Section 11 of Queensland *Electrical Safety Act 2002*

3.3.1 Network Operations

This portfolio covers all operating expenditure costs incurred or associated with the safe, effective, and reliable operation of the electricity network. The two primary components of network operations are:

Network Operations that comprise the operational expenditure to resource and operate Ergon Energy's network control centres.

- Operational Control Centre resourcing and operating
- Support services including hardware and software support.

System Operations that comprise the operational expenditure required to provide services including:

- Communications Network Operation Centre (CNOC) resourcing and operating
- Software license fees recurring for the operational technology and telecommunications software
- Technology support contracts for the operational technology and telecommunications systems
- Third party telecommunications costs for intelligent electronic devices deployed in power networks
- High voltage feeder protection capability reviews across the network

Table 4 outlines the overarching programs under the network operations portfolio, the key driver for each program, and the outcome each program delivers.

Table 4: Network operations programs

Plan portfolio	Program	Impact area	Deliverable
Network operations	Network operations	Safety	Electricity network monitoring, control and co-ordination
		Reliability	
	System operations (CNOC)	Cost	Communications network monitoring, control and coordination
		Reliability	
	Operational settings	Safety	Higher voltage feeder protection settings

3.3.2 Vegetation management

Ergon Energy is required, under section 216 of the *Electrical Safety Regulation 2013* to maintain a safe and reliable network by maintaining safe clearances between vegetation and power lines:

> *'An electricity entity must ensure that trees and other vegetation are trimmed and other measures taken, to prevent contact with an overhead electric line forming part of its works that is likely to cause injury from electric shock to any person, or, damage to property.'*

Ergon Energy maintains this level of safety, as well as ensuring a level of power supply reliability, through routine maintenance style vegetation and access track management programs. The effective management of vegetation clearance around power lines is essential for the preservation of public safety, the environment, and reliability of electricity supply, and to minimise recurrent costs.

Ergon Energy ensures that its management of vegetation clearances is effective through using a centralised resource-planning database (Ellipse) and Geographic Information Systems (GIS) (Smallworld), as well as through combining preventive maintenance with continual improvement. The Ergon Energy asset management approach can be summarised into several elements:

- understanding of requirements, risks and cost drivers
- effective policies, standards, procedures
- centralised annual and long term planning
- accountable annual program delivery and budget management
- information feedback to improve long term planning.

The Ergon Energy 'Vegetation and Access Track Management Strategy 2015-20', while predominantly considered a preventive-style maintenance program, contains both preventive and corrective elements. These include:

- Preventive - The ROAMES Light Detection and Ranging (LiDAR) aerial light and radar program, which captures aerial images over Ergon Energy's entire powerline infrastructure each year to manage vegetation near its powerlines[22]. The vegetation management program Plant Smart, a communication and education program, developed by Ergon Energy and Greening Australia to educate the community on planting appropriate trees under and around powerlines.
- Corrective - Planned inspection and treatment of vegetation, as well as unplanned customer service request responses.

This strategy was developed to implement a new access track inspection and maintenance policy to minimise required maintenance costs and improve general condition of its access tracks.

Some of the actions required to achieve this include:

- Identifying access tracks that service Ergon Energy assets and recording of track location and user limits in Smallworld[23] and GoogleEarth™ with maintenance history and condition in Ergon Energy's Enterprise Resource Planning system Ellipse
- Introducing a variable schedule for access track inspection that responds to cost and reliability drivers
- Allocating adequate and timely funds to ensure that there is capacity to remediate defects before they render tracks impassable or unsafe
- Communicating with external land management agencies to explore the scope for joint management of access tracks or sourcing of external funds for repairs and maintenance where it is possible to demonstrate a community benefit from use of the access track.

Table 5 outlines the overarching programs under the vegetation management portfolio, the key driver for each program, and the outcome each program delivers.

[22] The information captured in this project also has a much broader application. Light aircraft equipped with LiDAR began collecting data in late 2011. The data is then uploaded into the Google Maps Engine. Ergon Energy then uses Google Earth layers to present their sensor-captured data in an interactive, 3D visualisation environment.

[23] A customised Geographic Information System (GIS), which produces Ergon Energy's Network Model, which in turn includes the distribution network connectivity, the distribution network asset hierarchy and information pertaining to the electrical and spatial parameters of devices

Table 5: Vegetation management programs

Plan portfolio	Program	Impact area	Deliverable
Vegetation management	Vegetation clearance	Safety Reliability	Vegetation clearance and management from power line corridors
	Access tracks	Cost Reliability	Maintain condition of access network corridors facilitating maintenance and emergency response
	ROAMES	Cost Safety	Survey of Ergon Energy network supplying data for vegetation management, maintenance, and emergency response disaster recovery

3.3.3 Maintenance

The maintenance operating expenditure category comprises scheduled (routine) and non-scheduled (non-routine) inspection and maintenance activity across all Ergon Energy asset categories. These include:

- Overhead Feeder Circuits
- Overhead and Underground Plant
- Earthing Systems
- Operational Buildings and Sites
- Zone Substation Plant and Equipment
- Auxiliary Substation Components
- Protection and Control
- Network Communications Infrastructure
- Metering (comprising SCS and ACS)
- Street lighting (comprising ACS)

Ergon Energy's 'Standard for Preventive Maintenance Programs' summarises the routine maintenance programs. These are supported by the maintenance strategies 'Network Optimisation Management Plans' and 'Defect Classification Manuals' specific to each asset category listed in Section 3 and Section 4 of Appendix B. The 'Defect Classification Manuals' reflect the asset strategies and ensure consistent application of acceptance standards during routine inspection and maintenance activities.

Non-routine maintenance enables the timely response to instances of non-compliance against acceptance criteria identified during the routine maintenance process. Such activity may include more intensive (frequent) inspection cycles as the most cost effective manner to extend asset life in accordance with safety and regulatory obligations.

EA Technology Consulting Ltd has assisted Ergon Energy and Energex's joint initiative to develop a robust asset maintenance framework consistent with the *ISO55000 Asset Management Standard*. This framework, implemented across all asset categories, is a multi-tiered maintenance philosophy addressing:

- statutory compliance
- predictive understanding of asset condition
- 'intrusive' maintenance for asset life extension.

Ergon Energy has a well-established defect management process with resultant works required funded from either Non-Routine Maintenance (operating expenditure) or Asset Renewal (capital expenditure). The funding source is determined under asset capitalisation guidelines based mostly upon the rectification costs as a percentage of the asset value.

Table 6 outlines the overarching programs under the maintenance portfolio, the key driver for each program, and the outcome each program delivers.

Table 6: Maintenance programs

Plan portfolio	Program	Impact area	Deliverable
Maintenance	Routine	Safety	Inspections for compliance and asset condition inspections and maintenance to extend asset life. Electricity and rates communications and substations
		Reliability	
		Cost	
	Non-routine	Safety	Remediate non-conformant asset condition
		Reliability	

3.3.4 Demand management

Ergon Energy's capital investment program is driven by the need to address constraints in specific areas of the network. This includes areas where localised growth in peak demand requirements triggers the need to increase network capacity.

Capacity to cater for demand at peak times can be provided in a number of ways:

- build more network capacity
- use demand response technologies such as customer or network embedded generation or call off load
- work with customers to reduce their demand requirements during those peaks to free up existing capacity

Solutions to network constraints should explore all of these options in developing the most prudent and efficient response to addressing that constraint.

The 'Demand Management Overview 2015 to 2020' is a key document in Ergon Energy's AER submission. The 'Demand Management Overview 2015 to 2020' provides the platform for delivering the non-network alternatives program in the submission for the regulatory control period 2015 to 2020. To understand the role of the 'Demand Management Overview 2015 to 2020' and the role of demand management in Ergon Energy's network planning it is important to note that funding for demand management activities is justified when it is a prudent and efficient alternative to investing in network infrastructure.

Ergon Energy uses demand management, which includes a range of Non-Network Alternatives (NNA) solutions, as a tactical response to network problems – primarily where growing customer peak demand requirements give rise to the need to expand network capacity. It follows that there must be a compelling benefit for the business to deploy demand management. Deploying demand management solutions may mean in some circumstances that electricity consumption is reduced as a result. Ergon Energy believes that the value created in delivering demand management solutions is to be shared with relevant stakeholders, including customers, Ergon Energy and other partners.

The process of developing the program for NNA projects commences with the identification of network capacity limitations and is shown in Figure 1.

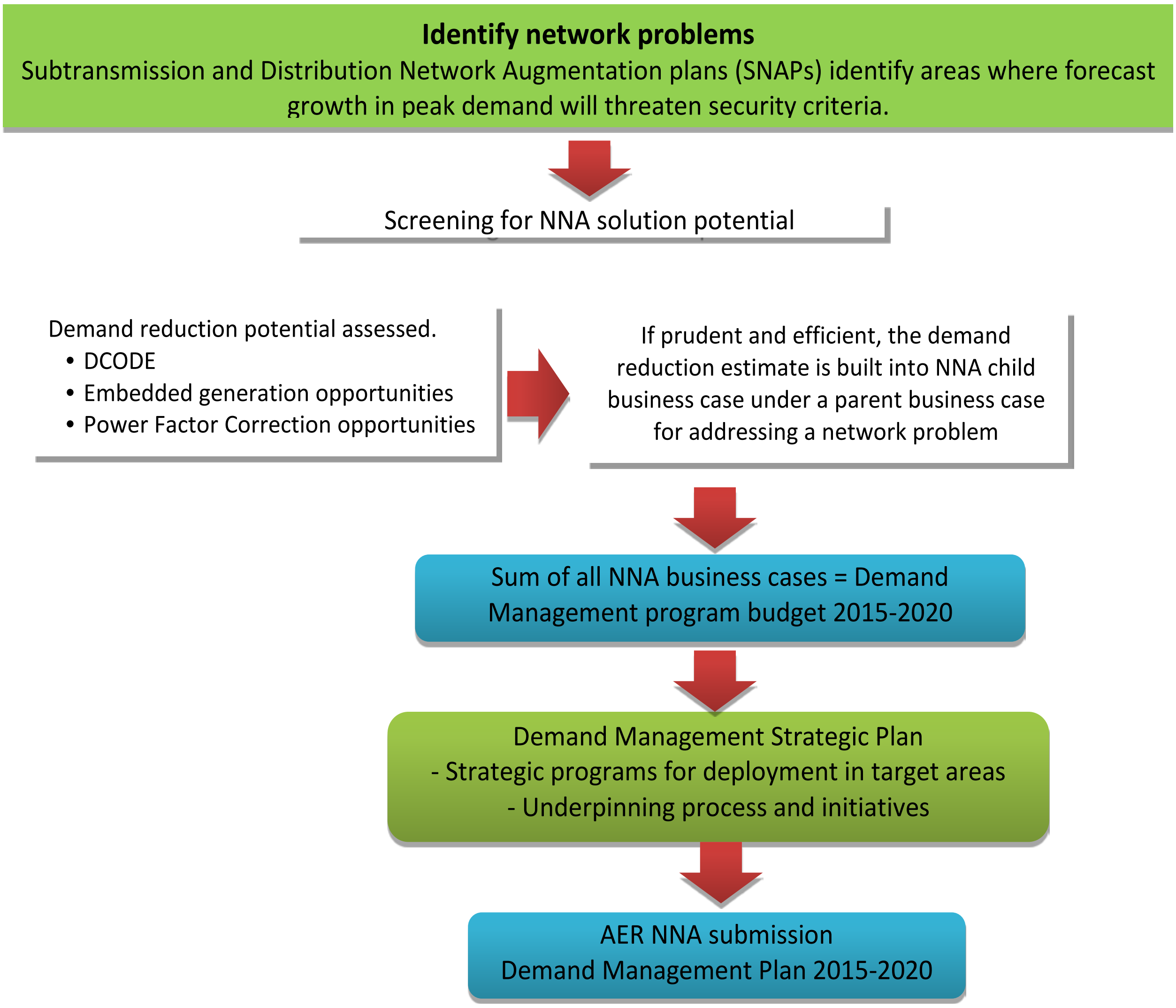

Figure 2: Developing the demand management business case for the 2015-20 AER submission

The planning process starts with Ergon Energy's peak demand forecast, which feeds into the analysis required for the 10-year 'Sub transmission Network Augmentation Plan' and the 'Distribution Network Augmentation Plan'. These plans identify areas of the network where increasing peak demand is likely to drive the need for investment in network capacity. The 'Forecast Expenditure Summary Corporation Initiated Augmentation 2015 to 2020' specifically references instances of deferral due to the implementation of demand management initiatives.

Screening of each constrained area determines whether there is potential for an NNA solution. Estimating the potential amount of demand reduction, uses a modification of the model used for the Demand Reduction Potential Review study to analyse potential at a zone substation level, taking into account the specific customer, forecast growth and the load profile for that zone substation. The Description and Costs of Decentralised Energy (DCODE) model uses Ergon Energy's customer and peak forecast data as inputs to estimate potential achievable demand reduction from the current and forecast customers in that area. Also included are the customer embedded generation and power factor correction opportunities to estimate the total potential demand side reduction over the period of interest.

The DCODE model identifies the range of demand side measures that can be applied within the constrained area to reduce demand. The 'Demand Management Overview 2015 to 2020' outlines how Ergon Energy will achieve our demand management targets prudently and efficiently by applying these measures through targeted strategic programs and initiatives.

Table 7: Demand management program

Plan portfolio	Program	Impact area	Deliverable
Demand Management	DMIA Non-Network Alternatives	Cost	Reduce/defer Capex expenditure - customer partnering
		Cost	Reduce/defer Capex expenditure

3.3.5 Emergency Response

Ergon Energy is required to ensure that sufficient funding and resources are available to respond to unexpected or unplanned events to safely and efficiently restore supply and asset integrity. The Emergency Response operating expenditure category operates under the principle of making safe and/or returning assets to functional capacity with any follow-up works carried out under non-routine maintenance or refurbishment capital expenditure.

Analysis of Dangerous Electrical Events reportable to the Queensland Electrical Safety Office over the past eight years indicates that 63% of events resulted from external impacts to Ergon Energy assets. These include storms, fire, vehicles, vegetation, and wildlife with storms making up 60% of these instances. Across the period of analysis, the level of 'unassisted' asset failures reported has remained reasonably constant with a standard deviation of only 6%.

Financial analysis across the last six years indicates that 80% of the total expenditure for Emergency Response is attributed to isolated cases, mostly storm related. The remaining 20% is related to response to moderate and major event response as reported in the Regulatory Information Notice) RIN.

Table 8 outlines the emergency response program, the key drivers, and the outcomes delivered.

Table 8: Emergency response program

Plan portfolio	Program	Impact area	Deliverable
Emergency response	Response	Safety	Attend to emergency and unplanned events
		Reliability	Make safe and/or return assets to functional capability Manage recovery from major unplanned events

3.4 Improved asset management practices within the current regulatory period

Ergon Energy is committed to aligning its asset management practices with the *ISO55000 Asset Management Standard* principles, and to undertaking good engineering practice.

Ergon Energy has made considerable improvements during the current regulatory control period. These include its data and information systems; the inspection and condition monitoring regimes; understanding of many asset failure modes, and its asset management and resourcing processes. These improvements have enabled Ergon Energy to making better maintenance and renewal decisions and to achieve more efficient resourcing outcomes during the current regulatory control period. Ergon Energy has built on these improvements in its regulatory proposal for the next regulatory control period.

For example, a lack of condition data meant that Ergon Energy used asset age as the prime determinant for renewal decisions for some substation and lines asset classes in its regulatory proposal for the current regulatory period. In its regulatory proposal for the next regulatory control period, Ergon Energy is using factors such as risk, ongoing maintenance cost, replacement cost, age and asset condition to inform its renewal decisions.

The improvement of Ergon Energy's asset information and processes enabled Ergon Energy to re-assess maintenance cycles and to defer or cancel a considerable number of refurbishment driven capital expenditure projects in the current regulatory period.

Ergon Energy has steadily improved its benchmark standards for component serviceability. In 2010, Ergon Energy significantly enhanced its 'Lines Defect Classification Manual' to remove the subjectivity in lines inspection processes. This improved Ergon Energy's ability to ensure the prudency of component replacements basing these on more clearly defined inspection processes and outcomes. The information has allowed packaging of consequential maintenance and renewal works processes to improve works efficiency and so reduce costs.

In 2013, Ergon Energy's testing criteria for all of its assets were reviewed and documented in a single document, named the Maintenance Acceptability Criteria. This document has removed a significant level of subjectivity in condition monitoring and substation maintenance expectations. Ergon Energy also improved its standards for inspection and maintenance tasks, extending to all substation assets. This has improved asset condition data and enabled better and more cost effective maintenance strategies. It has also supported extending end-of-economic-life decisions and plant rating decisions.

These asset management improvements are reflected in the unit costs and quantities that underpin Ergon Energy's maintenance and asset renewal expenditure forecasts for the next regulatory period.

4. Current regulatory period performance

This section examines why Ergon Energy's system operating expenditure in the current regulatory period differed from the forecasts that it presented to the AER in its regulatory proposal as well as the AER's own system operating expenditure allowance in its distribution determination. It also explains how Ergon Energy has incorporated learnings about these differences into its operating expenditure forecasts for the next regulatory period.

4.1 Ergon Energy's regulatory proposal and the AER's distribution determination

Ergon Energy's system operating expenditure forecasts in its regulatory proposal (and revised regulatory proposal) for the current regulatory control period were split into network operations, network maintenance (including preventive, corrective and forced maintenance) and other operating expenditure including demand management.

Ergon Energy forecast its system operating expenditure using a bottom up build. It did this by:

- Identifying the different types of operational and maintenance work needed to be undertaken.
- Identifying the amount of operational and maintenance work needed to be undertaken.
- Identifying the total cost of undertaking a single unit of work for the different types of work required (e.g. the calculation of a unit rate).
- Calculating the total cost of each type of operational and maintenance work for each of the classes of system assets for each of the five years.
- Aggregating the total operational and maintenance work required for each of the system assets for each of the five years.

In its determination of Ergon Energy's system operating expenditure forecast, the AER did not accept:

- Aspects of Ergon Energy's proposed preventive maintenance, including:
    - a four-year inspection cycle for its ground based poles. The AER stated that the inspection cycle should be increased to 4.5 years on the basis the poles were in excellent condition.
    - installing 300,000 locks and keys. However, the AER did accept Ergon Energy's revised program that took into account the installation of less than 41 000 locks.
    - The cumulative growth factor used to calculate its preventive maintenance forecast relating to the endangered species, declared plants, and cultural heritage regulatory obligations.
    - The coincident visual inspection program, as it considered that Ergon Energy ran a program that achieved a similar outcome; the full inspections program
- Aspects of Ergon Energy's proposed corrective maintenance, including:
    - Scope change increase in the corrective maintenance base year costs concerning dismantling of old lines that have been replaced.
    - The step change increase concerning the 100% increase in access track work volume in 2009–10. However, the AER did approve a 30 per cent increase in work volume in 2009–10.
    - The 1.6 per cent network growth escalator from Ergon Energy's operating expenditure modelling to account for new assets added to the asset pool.

- Forced maintenance costs, aimed to offset Ergon Energy's proposed increased spending in asset replacement capital expenditure programs, and increased spending in preventive and corrective maintenance operating expenditure.
- Incremental increase in demand management costs in relation to project management activities.

Table 9 compares the system operating expenditure forecasts that Ergon Energy submitted in its regulatory proposal and revised regulatory proposal with those approved by the AER in its distribution determination.

Table 9: Current period system operating expenditure proposed and allowed (direct costs, real $2014-15 million)

Regulatory Review Process	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Regulatory Proposal	315	330	335	340	336	**1,655**
Revised Regulatory Proposal	316	332	335	339	337	**1,659**
AER Determination	237	247	256	243	239	**1,221**

4.2 Performance against the AER's operating expenditure allowance

Ergon Energy expects that by the end of the current regulatory control period it will have underspent its system operating expenditure compared to the AER's allowance. As shown in Table 10, Ergon Energy's actual expenditure in the period to date as at the beginning of 2012-13 was $12 million more than allowed, and recovered this to $12 million below the period to date allowance by the end of that year. Ergon Energy expects that its system operating expenditure in the last two years of the regulatory control period will be $68 million below the AER's allowance, resulting in a 6% reduction in direct system operating expenditure over the total period, when compared to the AER's allowance.

Table 10: Current period system operating expenditure actual and allowance (direct costs, real $2014-15 million)

Regulatory Review Process	2010-11	2011-12	2012-13	2013-14	2014-15	Total
AER Determination	237	247	256	243	239	**1,221**
Actual/Estimate	242	254	232	205	209	**1,142**
Variance - Actual v Determination	**2%**	**3%**	**-9%**	**-16%**	**-13%**	**-6%**

4.3 Reasons for variance from AER's operating expenditure allowance

The response and recovery to severe Cyclone Yasi during the first year of the regulatory period have heavily dominated the outcomes of the current regulatory control period. Ergon Energy undertook months of restoration and recovery effort following the cyclone, with significant flow on effects for the large asset inspection and vegetation management programs. The maintenance recovery began later in 2011 and continued into 2012, and resulted in the recovery of backlogs in both programs and a return to standard maintenance cycles. Additionally, in 2012 Ergon Energy undertook a review of all aspects of maintenance programs resulting in a step change to costs in the year 2012-13, which has continued across the current period and is forecast to continue into the next period.

Following the recovery of the maintenance programs, Ergon Energy entered into a joint relationship with Energex to develop and implement a robust asset management framework led by EA Technologies Consulting Ltd. This framework, underpinned by Ergon Energy and Energex sharing knowledge and resources is based on the *ISO55000 Asset Management Standard*. This work led to, and supplemented a complete review of all maintenance programs with subsequent risk assessments resulting in the consolidation of programs and improvements in the efficiency of expenditure.

Significant efficiency improvements implemented during the period 2012 to 2014 have enabled the delivery of the maintenance program to be approaching 100% business as usual, with costs significantly reduced across all plan components. Flagship programs of asset inspection and vegetation management have returned to stable maintenance cycles with backlog programs completed and program delivery now sustainable. This is evidenced through Ergon Energy reporting zero poles outside of cycle compliance early in 2014 – the first time that this has occurred.

In addition to the improvements in program delivery, costs have been reduced significantly during the preceding two years. This has been achieved through systematically improving visibility through process and management reporting leading to better targeting maintenance tasks and delivery models. The largest programs have seen the largest gains and the newly implemented contracts for asset inspection and vegetation management have significantly reduced funding requirements. Component programs are funded in a sustainable manner with improvements forecast to continue into the next regulatory period. Ergon Energy's ROAMES program will play a significant role in continued efficiencies across the next regulatory period.

The following section identifies the key drivers for the reduction in system operating expenditure against the allowance.

4.3.1 Network Maintenance

Table 11 sets out Ergon Energy's actual and estimated preventative network maintenance expenditure as compared with the AER's determination for the regulatory control period 2010-15.

Table 11: Preventive network maintenance (direct costs, real $2014-15 million)

Regulatory Review Process	2010-11	2011-12	2012-13	2013-14	2014-15	Total
AER Determination	80	90	93	91	93	**447**
Actual/Estimate	59	72	67	53	70	**321**
Variance - Actual v Determination	**-27%**	**-19%**	**-28%**	**-41%**	**-25%**	**-28%**

Preventive network maintenance during the current regulatory period is expected to be $126 million less than the AER's allowance, or 28%. These cost savings were achieved through:

- Vegetation and Access Track Management – Completion of the vegetation backlog program and application of new technologies, ROAMES, resulted in more efficient delivery methodologies, which combined to deliver the maintenance program and meet obligations for approximately $30 million less than the AER's determination.
- Asset Inspection (poles) – Implemented a multi-cycle inspection regime based on risk assessment of specific pole types and locations resulting in an extension of the average maintenance cycle from four to 4.5 years. This was accompanied by significant improvements in delivery efficiency in contracts although changes to technical specification have reduced costs by approximately $15 million from the AER's determination.
- Lines Other – Changes in the risk assessment processes of inspection and maintenance associated with Lines Assets resulted in changes to 26 of 30 programs. Such changes can be categorised into:
    - Asset Criteria - Prioritising the assets selected for inclusion into programs
    - Inspection Cycle - Alteration to inspection cycle
      The resultant revised program is targeting a reduction of approximately $45 million less than the AER's determination
- Substations and Secondary Systems – This program underwent significant review based on collaboration between Ergon Energy and Energex. The resultant new maintenance framework implementation resulted in reductions in funding requirements of approximately $15 million from the determination.
- Metering - reduced funding requirements for metering were due to the deferral of the Smart Meter program, which saved approximately $20 million when compared to the AER's determination.

Additionally, Ergon Energy's extensive investment in communications and control infrastructure has resulted in higher funding requirements. This investment is largely due to the world industry progressing to a 'smarter' network that is able to accommodate technological advances and increasing variability in the energy demands of customers.

Table 12 sets out Ergon Energy's actual and estimated corrective network maintenance expenditure compared with the AER's determination for the 2010-15 regulatory control period.

Table 12: Corrective network maintenance (direct costs, real $2014-15 million)

Regulatory Review Process	2010-11	2011-12	2012-13	2013-14	2014-15	Total
AER Determination	91	90	94	85	79	**439**
Actual/Estimate	82	101	82	75	71	**412**
Variance - Actual v Determination	**-10%**	**12%**	**-13%**	**-12%**	**-10%**	**-6%**

Corrective network maintenance during the current regulatory period is expected to be $27 million, or 6% less than the AER's allowance. These cost savings were achieved through:

- Vegetation and Access Track Management – Completion of the vegetation backlog program and the application of new technologies (i.e. ROAMES) resulted in more efficient delivery methodologies which combined to deliver the maintenance program and meet obligations for approximately $40 million less than the AER's determination.
- Corrective Reactive (lines and substations/secondary systems) – Several significant instances of asset failure or malfunction at a 'whole of industry' level have impacted requirements for corrective maintenance funding. These include specifically failures of various ABB line switches and various makes of substation control and metering equipment. This accompanied by the expected outcomes of reduced preventive programs has combined to increase costs by approximately $13 million above the AER's determination.

The balance between corrective and preventive maintenance requirements is continually assessed and evaluated on the basis of safety, financial and reliability risks.

Table 13 sets out Ergon Energy's actual and estimated forced network maintenance expenditure compared with the AER's determination for the regulatory control period 2010-15.

Table 13: Forced network maintenance (direct costs, real $2014-15 million)

Regulatory Review Process	2010-11	2011-12	2012-13	2013-14	2014-15	Total
AER Determination	32	32	32	30	30	**155**
Actual/Estimate	71	44	50	47	41	**253**
Variance - Actual v Determination	**122%**	**38%**	**56%**	**57%**	**37%**	**63%**

Forced network maintenance during the current regulatory period is expected to be $98 million, or 63% more than the AER's allowance. These cost increases driven by major weather events totalled almost $50.1 million including:

- Cyclone Yasi in 2010-11, approximately $27 million
- Major Flooding 2010-11, approximately $3.5 million
- Extensive storms and flooding 2011-12, approximately $2.4 million
- Cyclone Oswald 2012-13, approximately $8.1 million
- Cyclones Ita and Dylan, approximately $5.1 million.

In addition to the above major events, Ergon Energy is experiencing a 25% increase in emergency response (forced maintenance) units, whose overall cost is offset partially by a 5% decrease in the unit rate costs.

As per the AER determination, specific major events have been excluded from funding allowances. As with corrective maintenance, a small portion of the expenditure is attributed to tighter preventive maintenance parameters. Ergon Energy notes that the impact of this on forced network maintenance is minimal and the largest impact is due to storm and other weather related activity.

Investment in programs such as ROAMES will improve the risk profile and will have a positive impact on forced maintenance in the next period.

4.3.2 Network Operations

Table 14: Network Operations (direct costs, real $2014-15 million)

Regulatory Review Process	2010-11	2011-12	2012-13	2013-14	2014-15	Total
AER Determination	20	20	21	21	22	**104**
Actual/ Estimate	26	26	24	23	23	**122**
Variance - Actual v Determination	**30%**	**30%**	**14%**	**10%**	**5%**	**17%**

Table 14 shows that the expected network operations expenditure during the current regulatory period will exceed the AER's allowance by $18 million, or 17%. These cost increases had two predominant driving factors:

- the expansion of the CNOC
- the exclusion (by omission) of funding required for Embedded Generation.

The expansion of the CNOC is related to the increase in demand for network system control and monitoring. This is related directly to the need for operation of a 'smarter' electricity network to accommodate technological advances and the increasing variability in the energy demands of customers. It is forecast that this requirement will increase significantly during the next period.

The Embedded Generation allowance represents running costs associated with generation embedded into the network to provide support at peak demand periods. Ergon Energy infrastructure is such that the requirement for this level of support is minimal at present and is increasing. It is forecast that future requirements will increase due to tighter system capacity management, and as a cost effective alternative to traditional infrastructure investment.

5. Expenditure forecasting methodology

5.1 Introduction

Ergon Energy's approach to forecasting operating expenditure for the regulatory control period 2015-20 is outlined in Ergon Energy's 'Forecast Expenditure Summary – Operating Costs'. That document supports Ergon Energy's full Regulatory Proposal by providing further detail of Ergon Energy's methodology for forecasting operating expenditure, and should be read in conjunction with this summary document. It explains the forecasting methodology, quantifies the baseline operating expenditure and any step changes in costs, and sets out the forecast trends in the escalation of those costs.

Ergon Energy's approach to forecasting operating expenditure has been developed with regard to the requirements of relevant sections of the National Electricity Rules that relate to operating expenditure and to the AER guidelines and recent commentary, in particular the *AER Expenditure Forecast Assessment Guideline for Electricity Distribution* and the accompanying *AER Explanatory Statement - Expenditure Forecast Assessment Guideline*, both published in November 2013.[24][25] The approach incorporates a base step trend (BST) forecast for most operating expenditure categories. However, a bottom-up methodology has been used for those cost categories where this approach was considered more appropriate.

The operating and maintenance program is divided into specific portfolios each containing sub programs with both individual and complementary impacts on Ergon Energy's business objectives. These portfolios are defined as:

- **Network Operations**, which includes forecast of costs associated with the operation of the network control centres, communications network operations control centre, smart network, and operational protection settings.
- **Vegetation Management**, which includes all costs incurred to manage vegetation and associated access track requirements generated by cyclic Maintenance Scheduled Task (MST) application to network asset equipment as defined in the Standard for Preventive Maintenance Programs. Additional forecast expenditure for non-MST works includes vegetation non-compliance defects and access tracks corrective works required to return access to safe and useable condition. The access track works are predominantly to facilitate routine maintenance and emergency response activities.
- **Maintenance**, which includes all operating expenses associated with routine inspections and cyclic maintenance requirements generated by MST application to network asset equipment as defined in the Standard for Preventive Maintenance Programs. Additional forecast expenditure for non-MST works includes all costs associated with the rectification of asset non-conformance or malfunction.
- **Emergency Response** to unexpected or unplanned events ensuring the safe and efficient restoration of supply, and secures asset integrity.
- **Demand Management** operating costs for demand management investments, embedded generation system support, customer initiatives and the Demand Management Innovation Allowance (DMIA)

[24] Australian Energy Regulator, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, available at http://www.aer.gov.au/node/18864.

[25] Australian Energy Regulator, *AER Explanatory Statement - Expenditure Forecast Assessment Guideline*, November 2013, available at http://www.aer.gov.au/node/18864.

5.2 Forecasting methodology

Ergon Energy has adopted the BST methodology for the majority of its recurrent operating expenditure forecasting. The adoption of the BST methodology represents a change in Ergon Energy's approach from the current regulatory control period.

In simple terms, the BST methodology applied by Ergon Energy in preparing its operating expenditure forecasts consists of:

- selecting a base year
- making appropriate adjustments to remove certain non-recurrent items and movements in provisions
- making any further adjustments required to establish an efficient base year
- identifying and applying any recurrent step changes
- applying a rate of change consisting of output growth, real price growth and productivity growth to establish the trend.

Figure 3 shows the BST methodology applied by Ergon Energy.

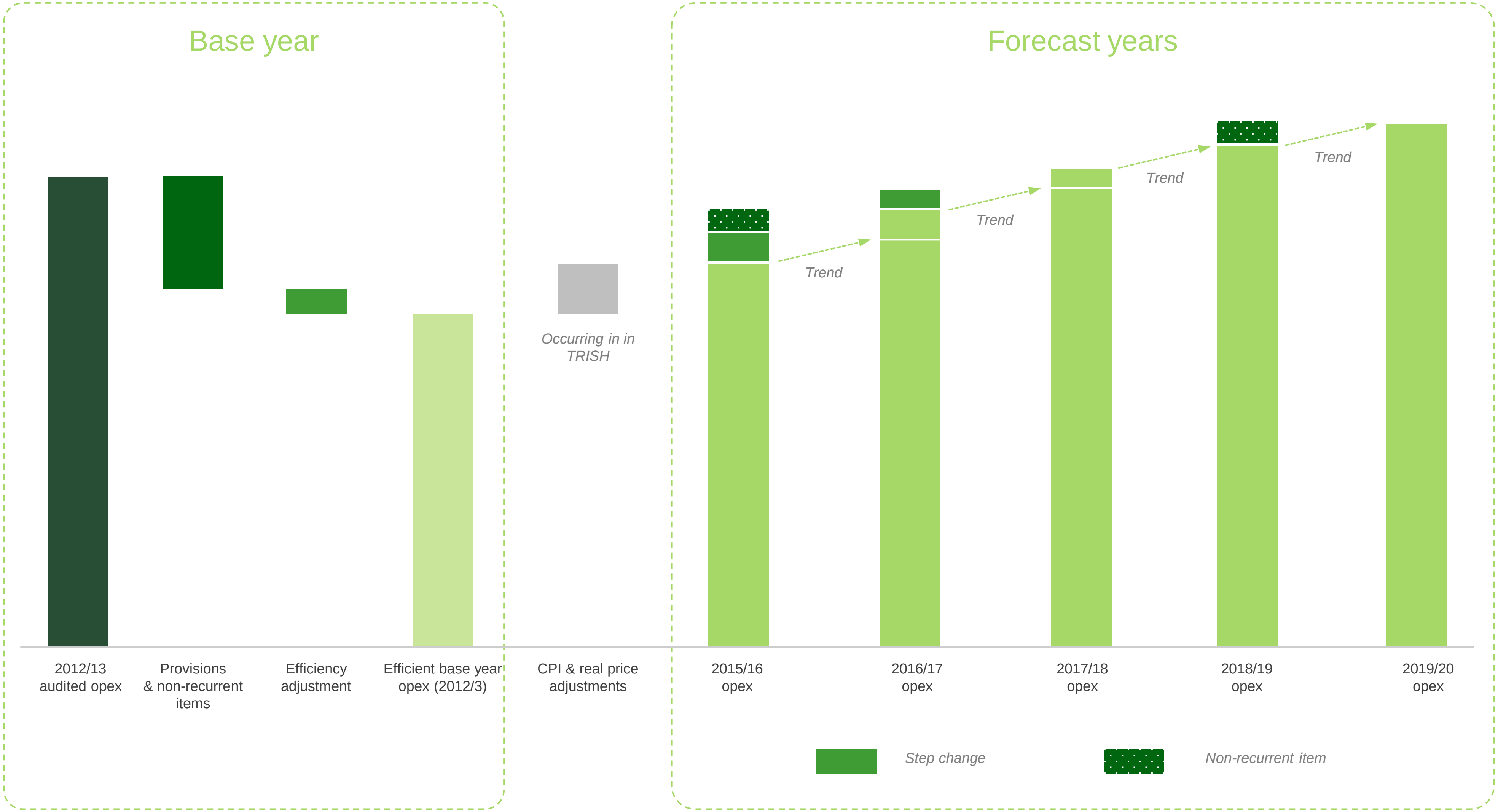

Figure 3: BST methodology applied by Ergon Energy

Table 15 depicts the key operating expenditure forecasting methodology adopted for each category of operating expenditure referred to within this document.

Table 15: Operating expenditure forecasting methodology by category

Operating expenditure category	BST	Bottom Up
Network operations	✓	
Vegetation management	✓	
Maintenance	✓	
Emergency response	✓	
Demand Management NNA DMIA	✓	✓

5.3 Base year and approach to adjustments

The initial step in developing operating expenditure forecasts under the BST method involves selecting an efficient base year to use as the basis upon which to build the forecast.

Ergon Energy has chosen the 2012-13 financial year as the base year for the purposes of forecasting operating expenditure for the Regulatory Proposal. In addition to being the third year of Ergon Energy's current regulatory control period, 2012-13 represents the most recent financial year for which audited regulatory accounts were available at the time that the operating expenditure forecasts were prepared.

The adjustments made to the 2012-13 audited operating expenditure numbers removed expenditure incurred in the base year that related to specific one-off or unusual events (i.e. costs that are not representative of a typical year of recurrent operating expenditure). Refer to Section 2.3.2, 'Forecast Expenditure Summary – Operating Costs'.

Consistent with the 'AER Expenditure Forecast Assessment Guideline for Electricity Distribution'[26], Ergon Energy has made adjustments to the base year expenditure to account for any movements in provisions. Refer to Section 2.3.3, 'Forecast Expenditure Summary – Operating Costs'. Further efficiency adjustments have been made to the base year to account for changes in business practices that have resulted in additional expenditure reductions, resulting in an efficient base year upon which to forecast future operating expenditure. Refer to Section 2.3.4, 'Forecast Expenditure Summary – Operating Costs'.

Ergon Energy has mapped its revealed costs from its last audited 2012-13 year financial data to groupings called 'Functional Areas' for the purposes of its base year data. These Functional Areas are further mapped and combined into category level data for aggregate level reporting. The efficient base year is then adjusted for any step changes (Refer to Section 2.3.6, 'Forecast Methodology Summary Forecast Expenditure Summary – Operating Costs' and Section 2.3.6, 'Forecast Expenditure Summary – Operating Costs') and a rate of change is then applied to account for:

- Output growth - Distribution networks grow in size, and therefore face a corresponding increase in the cost associated with operating and maintaining the network. Refer to Section 2.3.7, 'Forecast Expenditure Summary – Operating Costs'.

[26] Australian Energy Regulator, Expenditure Forecast Assessment Guideline for Electricity Distribution, November 2013, available at http://www.aer.gov.au/node/18864.

- Real price growth - A real increase has been applied to all materials and labour used in undertaking repairs and maintenance. Refer to Section 2.3.8, ‘Forecast Expenditure Summary – Operating Costs’.
- Productivity growth - As the network grows, Ergon Energy are able to achieve improved economies of scale. Refer to Section 2.3.3, ‘Forecast Expenditure Summary – Operating Costs’

While the application of a BST methodology is the preferred approach to forecasting most Functional Areas within Energy Energy’s business, Ergon Energy has applied a bottom-up forecasting methodfor Functional Areas that are uncontrollable costs or considered non-recurrent in nature (excluding base year adjustments). (Refer to Section 2.4, ‘Forecast Expenditure Summary – Operating Costs’.) Ergon Energy considers that it would be inappropriate to forecast costs of this nature using a trend escalator. Table 16 sets out the Functional Areas forecast using a bottom-up approach.

Table 16: Functional areas forecast using a bottom up approach

Functional Area	Explanation
DMIA	Expenditure relates to individual initiatives not of a recurrent nature and therefore not appropriate for a BST approach

Table 17 summarises the output of the BST approach to forecasting system operating expenditure.

Table 17: Proposed system operating expenditure build up under the BST (direct costs, real $2014-15 million)

BST component	2012-13	2015-16	2016-17	2017-18	2018-19	2019-20
Baseline system operating expenditure	231.51					
Non-recurrent costs	5.50					
Provisions	1.20					
Efficiency	12.50					
Bottom-up costs	0.90					
Adjusted baseline system operating expenditure		**214.71**	**214.71**	**214.71**	**214.71**	**214.71**
Step changes		5.00	5.00	5.00	5.00	5.00
Network Growth, Real Price Escalation and Productivity growth		1.94	4.73	7.35	9.97	13.32
Bottom-up forecast		0.90	0.90	0.90	0.90	0.90
System operating expenditure forecast		**222.55**	**225.35**	**227.97**	**230.59**	**233.94**

6. Expenditure forecasts and outcomes for next period

This section details Ergon Energy's forecasts for its system operating expenditure for the next regulatory control period that it is proposing the AER approve. It also details the network, risk, and customer outcomes associated with these forecasts.

6.1 Expenditure forecasts for next regulatory control period

Table 18 below summarises the key system operating expenditure categories that make up the system operating expenditure forecast for the 2015-20 regulatory control period and the forecast costs required to deliver these programs.

Table 18: System operating expenditure forecast by category (direct costs, real $2014-15 million)

Category	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Network Operations	24	25	25	25	26	**125**
Vegetation Management	49	50	50	51	52	**252**
Maintenance	91	92	93	94	96	**467**
Emergency Response	46	47	47	47	48	**235**
Demand Management	12	12	12	12	13	**61**
Total	**223**	**225**	**228**	**231**	**234**	**1,140**

System operating expenditure is forecast to be $1,140 million for the 2015-20 regulatory control period, $81 million or 7% lower than the AER's determination for the 2010-15 regulatory control period and $2 million or 0.1% below the forecast for the current 2010-15 period. The key categories of this expenditure program are:

- **Maintenance:** $467 million or 41% of all forecast system operating expenditure is driven by the continuation of the current preventive, corrective, and forced maintenance requirements. The output of Ergon Energy's maintenance program is compliance with all applicable regulatory obligations or requirements, maintaining the reliability, safety, and security of the distribution system and meeting customer demands. The five year total is reflective of further progression of efficiency initiatives in contract models and ROAMES development.
- **Vegetation Management:** $252 million or 22% of all forecast system operating expenditure is driven by the continuation of the current vegetation management program, consistent with Ergon Energy's requirements under section 148 of the *Electrical Safety Regulation 2013*, to maintain a safe and reliable network by maintaining safe clearances between vegetation and power lines. The five year total is reflective of further progression of efficiency initiatives in contract models and ROAMES development.
- **Emergency Response:** $235 million or 21% of all forecast system operating expenditure is driven by the requirement to attend to emergency and unplanned events, to address safety and reliability risks. The Emergency Response forecast includes funding responses to moderate weather events and the deductible (parametric insurance) with major events being included in parametric insurance cover.

- **Network Operations:** $125 million or 11% of all forecast system operating expenditure ensures the safe, effective, and reliable operation of the electricity network. Ergon Energy uses network operating expenditure to resource and operate network control centres and for system operations that comprise the operational expenditure required to provide services.
- **Demand Management:** $61 million or 5% of all forecast system operating expenditure is driven by the need to address network problems in specific areas of the network. This includes areas where localised growth in peak demand requirements triggers the need to build additional network capacity.

Vegetation management and maintenance, 63% of forecast costs, dominates the system operating expenditure forecast. The quantum of the forecast comes from a base driven down through strategic and delivery efficiencies enacted during the course of the 2010-15 regulatory period.

The average annual increase across the 2015 to 2020 regulatory control period (1.3%) reflects the operating costs associated with increased capital expenditure investment in communications (smart network) infrastructure and demand management activities.

The forecast for the next regulatory control period 2015 to 2020 continues the journey Ergon Energy has undertaken to improve the prudency and efficiency of its operating expenditure. Ergon Energy's customers set this challenge early in the current regulatory control period and in response, Ergon Energy has driven a significant review of maintenance strategies and expenditure needs. For the first two years of the period, Ergon Energy experienced significant increases in its emergency response costs, as it responded to Yasi and major flooding issues, having flow on impacts on the delivery of other programs.

In response, significant efficiency improvements were implemented during the period 2012 to 2014 to offset these increases, to the extent that Ergon Energy's maintenance program delivery is approaching a sustainable baseline with costs significantly reduced across all plan components. The backlog of asset inspection and vegetation management programs have been completed, returned to baseline maintenance cycles, and sustainable program delivery. This is evidenced through Ergon Energy reporting zero poles outside of inspection cycle compliance early in 2014, a first ever.

In addition to the much improved program delivery, costs too have been reduced during the preceding two years. This has been achieved through systematically improving visibility through process and management reporting leading to better targeting maintenance tasks and delivery models. The largest programs have seen the largest gains and the newly implemented contracts for asset inspection and vegetation management have significantly reduced funding requirements. Component programs are funded in a sustainable manner with improvements forecast to continue into the next regulatory period. This is achieved while maintaining reliability performance and asset risk profile. Other items of lesser monetary significance are:

- metering, where additional funds are required to meet Australian Energy Market Operator (AEMO) requirements for meter testing and conformance to defined accuracy parameters.
- substation maintenance funding to address contaminated land issues resultant mostly from previous uses of the land (e.g. fuel tanks in depots/substations).

- lines maintenance to re-establish the Air Break Switch Inspection and Maintenance Program. This program was deferred while Ergon Energy focused resources on replacing faulty ABB switches. A risk assessment conducted recommended re-instatement of the program once the replacements were complete. To make a decision on the level of expenditure or to invest at all in the short, medium, or longer term, or to assess the impact if a different profile or magnitude of perpetual work was delivered – impact on risk: decision makers require an understanding of alternative options considered, and the consequences if the preferred plan is not endorsed. Lower cost options may not deliver benefits as beneficial but may be fit for purpose and perhaps life of investment becomes the deciding factor.

Ergon Energy has identified the most prudent and efficient expenditure programs to operate and maintain its distribution asset base in order to continue efficiently delivering its service performance, and to maintain the reliability and quality of supply of the distribution system as required by technical and statutory standards.

The following breaks down the system operating expenditure by the aforementioned categories, identifies the relevant primary driver for that expenditure, the expected outcome and/or risk mitigated and the program's cost.

6.2 Forecast Maintenance Expenditure

As already highlighted, one of the key drivers behind the moderate increase in forecast system operating expenditure for the next regulatory control period, is communications and control, where significant capital expenditure investment is being reflected in system operating expenditure as additional maintenance and support: CNOC staffing, licences, third party agreements. This additional investment will facilitate implementation of a 'smart network', providing the required level of asset visibility and management control to more effectively target works, and to manage demand and utilisation.

The five-year total is reflective of further progression of efficiency initiatives in contract models and ROAMES development being implemented during and since the 2012-13 base year. The efficiency reduction to base year represents the quantum of those changes implemented as a sustainable platform for the regulatory control period 2015-20 and further.

Provision has been made within the Substation maintenance portfolio to address contaminated land issues resultant mostly from previous uses of the land – fuel tanks in depots and substations and the like. This represents a commitment of $5.8 million ($1.16 million per year) across the regulatory control period 2015-20, during which time any further requirements will be assessed and addressed.

The Step Change reflected relates to ACS Metering, where additional funds are required to meet AEMO requirements for meter testing and conformance to defined accuracy parameters. Electromechanical meters are the primary target for this testing.

Table 19 sets out Ergon Energy's proposed maintenance operating expenditure in the regulatory control period 2015-20, broken down by BST component.

Table 19: Proposed maintenance operating expenditure build up under the BST (direct costs, real $2014-15 million)

BST component	2012-13	2015-16	2016-17	2017-18	2018-19	2019-20
Baseline maintenance operating expenditure	**98.81**					
Non-recurrent costs	-					
Provisions	1.20					
Efficiency	8.00					
Adjusted baseline maintenance operating expenditure		**92.01**	**92.01**	**92.01**	**92.01**	**92.01**
Step changes		1.00	1.00	1.00	1.00	1.00
Network Growth, Real Price Escalation and Productivity growth		(1.80)	(0.69)	0.34	1.37	2.71
Maintenance operating expenditure forecast		**91.21**	**92.32**	**93.35**	**94.38**	**95.72**

6.3 Forecast Vegetation Management Expenditure

As with maintenance, the Vegetation management forecast is reflective of further progression of efficiency initiatives in contract models and ROAMES development being implemented during and since the 2012-13 base year. The efficiency reduction to base year represents the quantum of those changes implemented as a sustainable platform for the 2015-20 regulatory period and beyond. Vegetation Management funds the cost of the ROAMES program which delivers benefits across many business functions.

Since the completion of the vegetation backlog program which returned vegetation management to a maintenance condition, the contract cost per span has been steadily declining and is forecast to reach approximately 30% lower than the 2012-13 level towards the end of the 2015-20 regulatory period. Current analysis shows that this is both achievable and sustainable in the present market assuming the conditional chemical treatment use that is permitted in Queensland continues.

Table 20 sets out Ergon Energy's proposed vegetation management operating expenditure in the 2015-20 regulatory control period, and broken down by BST component.

Table 20: Proposed vegetation management operating expenditure build up under the BST (direct costs, real $2014-15 million)

BST component	2012-13	2015-16	2016-17	2017-18	2018-19	2019-20
Baseline vegetation management operating expenditure	**50.24**					
Non-recurrent costs	-					
Provisions	-					
Efficiency	4.50					
Adjusted baseline vegetation management operating expenditure		**45.74**	**45.74**	**45.74**	**45.74**	**45.74**
Step changes		-	-	-	-	-
Network Growth, Real Price Escalation and Productivity growth		3.17	3.93	4.66	5.40	6.30
Network vegetation management operating expenditure forecast		**48.90**	**49.67**	**50.40**	**51.14**	**52.04**

6.4 Forecast Emergency Response expenditure

The forecast emergency response is driven by the requirement to attend emergency and unplanned events, to protect safety and reliability risks. By definition, the funding required is driven by the nature of the category, and is based on historical assessment of the likelihood and magnitude of weather events. Based on the current condition of distribution assets, the emergency response forecast includes funding for a predicted number of moderate weather events and 'normal' storm and external impacts. The introduction of parametric insurance will provide financial cover for the major weather events leaving the deductible (excess) payable under this category of emergency response.

Table 21 sets out Ergon Energy's proposed emergency response operating expenditure in the regulatory control period 2015-20, broken down by the BST component. It can be seen that the 2012-13 costs have been reduced to reflect parametric insurance and projected forward as a typical year for emergency response requirements.

Table 21: Proposed emergency response operating expenditure bottom up forecast (direct costs, real $2014-15 million)

BST component	2012-13	2015-16	2016-17	2017-18	2018-19	2019-20
Baseline emergency response management operating expenditure	**50.36**					
Non-recurrent costs	5.50					
Provisions	-					
Efficiency	-					
Adjusted baseline emergency response operating expenditure		**44.86**	**44.86**	**44.86**	**44.86**	**44.86**
Step changes		-	-	-	-	-
Network Growth, Real Price Escalation and Productivity growth		1.22	1.71	2.15	2.59	3.19
Network emergency response operating expenditure forecast		**46.09**	**46.57**	**47.01**	**47.46**	**48.05**

6.5 Forecast Network Operations expenditure

The forecast funding for network operations is to ensure the safe, effective, and reliable operation of the electricity network. System operating expenditure is used to resource and operate Ergon Energy's network control centres and also for system operations that comprise the operational expenditure required to provide services. The forecast is flat and stable despite the significant increase of network asset data traffic resultant from investment into 'smart network'. The monitoring and control centre infrastructure is largely in place and capital expenditure investment in this area will result in business efficiencies such that the BST approach on 2012-13 costs will be appropriate to cater for the increase in data traffic and operational requirements

Table 22 sets out Ergon Energy's proposed network operations operating expenditure in the regulatory control period 2015-20, broken down by BST component.

Table 22: Proposed network operations operating expenditure build up under the BST (direct costs, real $2014-15 million)

BST component	2012-13	2015-16	2016-17	2017-18	2018-19	2019-20
Baseline network operations operating expenditure	**23.95**					
Non-recurrent costs	-					
Provisions	-					
Efficiency	-					
Adjusted baseline network operations operating expenditure		**23.95**	**23.95**	**23.95**	**23.95**	**23.95**
Step changes		-	-	-	-	-
Network Growth, Real Price Escalation and Productivity growth		0.43	0.74	1.03	1.31	1.68
Network operations operating expenditure forecast		**24.39**	**24.69**	**24.98**	**25.27**	**25.63**

6.6 Forecast Demand Management Expenditure

As already highlighted, one of the key drivers behind the moderate increase in forecast system operating expenditure for the next regulatory control period is demand management operating expenditure. This will involve implementing strategic projects that will defer and in some cases negate the need for major infrastructure projects of a more ‘traditional’ nature. The deferral and/or avoidance of future capital expenditure will reduce future maintenance and operational costs of the network, providing greater cost savings for customers.

Ergon Energy’s demand management expenditure is forecast to consist predominantly of operating expenditure with some non-system capital expenditure investment, and includes a range of activities such as demand management programs, strategic initiatives, operational programs, DMIA, and program management.

Ergon Energy’s forward forecast of demand management activities is forecast from the BST model utilising a base year of 2012-13 plus a step change to reflect forecast requirements for Demand Management operating expenditure across the 2015-20 regulatory control period.

The step change of $4 million for the demand management program is due to several factors:

- The application of the new security criteria which:
  - require Ergon Energy to manage the associated risk with lower than traditional augmentation cost afforded through demand management solutions
  - result in increasing risks in feeder network requiring increased levels of sophistication in the demand management program
- The need to increase the number of demand contracts requires investment in new systems, procedures and process in order to be able to efficiently manage the increases in demand opportunities
- Efficient management of the number of demand contracts and enabling management of the loads will require a range of automation systems to ensure appropriate management of the feeder risks.
- Ergon Energy’s strategies are to enable market delivery of demand and to engage the market in network risks and issues. This market engagement model is a change in direction from the previous demand management activities and as such a range of capabilities will be developed in order to support market activities
- The gradual erosion of existing ‘excess’ capacity in the network over the regulatory control period combined with a reduced capital expenditure program will increase the network risks and hence the need for demand management to support the operation of the network at higher levels of capacity
- A focus on capital expenditure reduction increases the need for non-traditional solutions to managing the network risks resulting in increased expenditure in programs such as demand management and
- Enabling the uptake of new technologies by our customers, such as photovoltaics and energy storage systems.

Table 23 sets out Ergon Energy’s proposed demand management operating expenditure in the 2015-20 regulatory control period, broken down by BST component.

Table 23: Proposed demand management operating expenditure build up under the BST (direct costs, real $2014-15 million)

BST component	2012-13	2015-16	2016-17	2017-18	2018-19	2019-20
Baseline demand management operating expenditure	**8.15**					
Non-recurrent costs	-					
Provisions	-					
Efficiency	-					
Bottom-up costs	0.90					
Adjusted baseline demand management operating expenditure		**7.25**	**7.25**	**7.25**	**7.25**	**7.25**
Step changes		4.00	4.00	4.00	4.00	4.00
Network Growth, Real Price Escalation and Productivity growth		(0.19)	(0.05)	0.07	0.19	0.35
Bottom-up forecast		0.90	0.90	0.90	0.90	0.90
Network demand management operating expenditure forecast		**11.96**	**12.10**	**12.22**	**12.34**	**12.50**

6.7 Customer outcomes

The purpose of this section is to explain how we have considered the benefits and risks to consumers and incorporated feedback from consumers and other stakeholders into our expenditure forecasts.

The requirements of the operating and maintenance forecast are driven by the commitments Ergon Energy has made to customers to achieve peace of mind, best possible price and choice and control. These are described in further detail in 'Informing Our Plans, Our Engagement Program'. Table 24 below displays the high-level contributions by operating expenditure portfolios to Ergon Energy's customer commitments.

Table 24: Customer commitment contribution

Customer commitment	Plan portfolio	Contribution
Peace of mind	Network operations	Safely monitor and operate the network
	Vegetation management	Maintain safety and security of the network
	Maintenance	Maintain safety and security of the network
	Emergency response	Response to unexpected or unplanned events
Best possible price	Network operations	New technology
	Vegetation management	Efficient provision of Standard Control Services
	Maintenance	Efficient provision of Standard Control Services
		Maintain supply reliability
Choice and control	Network operations	Smart network
		Integrate IES solutions
	Maintenance	Prepare for retail choice (Metering)
		Smart network (Communications)
	Demand management	Integrate IES solutions

7. Meeting Rules' Requirements

This section draws on the material in the previous sections to explain and justify Ergon Energy's operating expenditure forecast against the operating expenditure objectives and criteria in clause 6.5.6 of the National Electricity Rules.

It therefore outlines why the AER should approve this operating expenditure forecast as part of its distribution determination for Ergon Energy's next regulatory control period.

7.1 Operating expenditure objectives

The National Electricity Rules set out the objectives that Ergon Energy must satisfy for its proposed operating expenditure for the next regulatory control period. Clause 6.5.6(a) states:

> *A building block proposal must include the total forecast operating expenditure for the relevant regulatory control period which the Distribution Network Service Provider considers is required in order to achieve each of the following (the operating expenditure objectives):*
>
> *(1) meet or manage the expected demand for standard control services over that period;*
>
> *(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;*
>
> *(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:*
>
> > *(i) the quality, reliability or security of supply of standard control services; or*
> >
> > *(ii) the reliability or security of the distribution system through the supply of standard control services,*
>
> *to the relevant extent:*
>
> > *(iii) maintain the quality, reliability and security of supply of standard control services; and*
> >
> > *(iv) maintain the reliability and security of the distribution system through the supply of standard control services; and*
>
> *(4) maintain the safety of the distribution system through the supply of standard control services.*

Standard Control Services is the name given to those services that Ergon Energy provides by means of, or in connection with, its distribution system, and for which the costs incurred by Ergon Energy in doing so are generally recovered through distribution use of service tariffs paid by all, or most, customers. Standard Control Services are grouped into five categories: network services, connection services, metering services, ancillary network services and public lighting services The Standard Control Services that Ergon Energy provides to customers are set out in the AER's *Framework and Approach – Ergon and Energex 2015-2020* paper.[27] System operating expenditure relates to network services, metering services, ancillary network services and public lighting.

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[27] AER, Framework and Approach – Ergon and Energex 2015-2020, April 2014, p 51.

Ergon Energy has established its operating expenditure forecasts to comply with the operating expenditure objectives specified in the National electricity Rules. Ergon Energy has demonstrated this by:

- examining its revealed base year costs incurred in meeting current service level and regulatory obligations and any planned efficiency adjustments
- assessing the sufficiency of its current compliance with regulatory obligations to identify step changes for corrective actions
- assessing foreseeable changes in obligations that will affect its operating activities and costs to identify step changes
- incorporating output growth, real price growth and productivity growth from expert determined demand growth and input cost analysis.

Table 25 below summarises how Ergon Energy has achieved the operating expenditure objectives.

Table 25: Achieving the operating expenditure objectives

Operating expenditure objective	Rule	Ergon Energy actions to ensure compliance
Meet or manage the expected demand for standard control services over that period	6.5.6(a)(1)	Ergon Energy has prepared its forecast costs to take into account the effects on expenditure for managing network growth, customer numbers and consumption forecasts. Ergon Energy's load and customer forecasting methodologies are based on established forecasting practice and support the growth rates used to develop the forecast trends.
Comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	6.5.6(a)(2)	Ergon Energy has assessed its current compliance (and associated base costs) as well as assessing corrective actions and additional new obligations (and associated step changes).
To the extent that there is no applicable regulatory obligation or requirement in relation to maintain the quality, reliability and security of supply of standard control services; or the reliability or security of the distribution system through supply of standard control services, to the relevant extent: maintain the quality, reliability and security of supply of standard control services; and maintain the reliability and security of the distribution system through the supply of standard control services; and	6.5.6(a)(3)	Ergon Energy has assessed its requirements to maintain the quality, reliability and security of supply of standard control services as part of its annual network management planning process.
Maintain the safety of the distribution system through the supply of standard control services.	6.5.6(a)(4)	Ergon Energy has assessed its requirements to maintain the safety of the distribution system as part of its network management planning process.

System operating expenditure is driven by Ergon Energy's customer commitments, which are supported by regulatory and statutory requirements, codes of works and industry standards. The content of the system operating expenditure program balances these requirements within the funding proposed through:

- compliance with all applicable regulatory obligations or requirements
- maintaining the reliability, safety, and security of the distribution system
- managing the forecast demand for Standard Control Services by reviewing cost and risk.

Ergon Energy believes that its proposed operational expenditure for system assets in the next regulatory control period achieves the objectives as follows:

- The system operational expenditure that Ergon Energy proposes is necessary to comply with all applicable regulatory obligations or requirements associated with the provision of standard control services, as required by clause 6.5.6(a)(2).
  As described in Section 3.1, Ergon Energy is subject to regulatory obligations imposed by several statutory instruments at a state and at a federal level. Key Queensland legislation includes, but is not limited to, the Work Health and Safety Act 2011 (Qld), the Electrical Safety Act 2002 (Qld) and enforceable orders issued by the Queensland Electrical Safety Office. These obligations underpin Ergon Energy's asset management strategies, risk management framework, maintenance/inspection activities and associated practices, strategies and policies. The methods that Ergon Energy has developed to forecast its system operational expenditure, which are set out in Section 5.2, are underpinned by the decision making processes to inspect, maintain and operate assets, which based on the maturity of such processes in the base year (2012-13) and the continual improvement path that Ergon Energy is on.
  The resulting works that Ergon Energy proposes to undertake are intended to discharge Ergon Energy's obligations under these and other statutory instruments. For further details on specific aspects of the proposed works in the 2015-20 regulatory control period refer to Ergon Energy's supporting strategies, management plans, engineering reports and forecast detail set out in Sections 6.2 to 6.6, which in turn form the basis for the system operational expenditure forecast set out in Section 6.1.
- The system operational expenditure that Ergon Energy proposes is required to maintain the safety of the distribution system through the supply of standard control services, in accordance with clause 6.5.6(a)(4). Ergon Energy has obligations under the Electrical Safety Act 2002 (Qld) to inspect, test and maintain works, and a duty to ensure that its works are electrically safe and are operated in a way that is electrically safe. Under the Work Health and Safety Act 2011 (Qld), Ergon Energy must ensure, so far as is reasonably practicable, that the fixtures, fittings and plant are without risks to the health and safety of any person. Additionally, Ergon Energy is subject to enforceable orders issued by the Queensland Electrical Safety Office in response to identified safety risks.
  - To discharge these obligations, Ergon Energy has implemented a comprehensive Work Health and Safety governance framework that governs the safety, and the safe operation, of the distribution system. These policies are given effect through inspection, maintenance and operating programs. Ergon Energy believes that the works conducted in these programs are therefore necessary to maintain the safety of the distribution system in accordance with Ergon Energy's regulatory obligations. Additionally, where safety risks that are specific to particular assets or classes of assets are identified, Ergon Energy undertakes discrete analyses of the risks and has proposed targeted programs of work (inspection and/or maintenance) to prevent unacceptable deterioration in the safety of its assets. For further details on specific aspects of the

proposed works in the 2015-20 regulatory control period refer to the system operational expenditure forecast set out in Section 6.

- The system operational expenditure that Ergon Energy proposes is necessary to maintain the quality, reliability and security of supply of standard control services, and hence the reliability and security of the distribution system, as required by clause 6.5.6(a)(3).
- The *Electrical Safety Act 2002* (Qld), and Ergon Energy's Distribution Authority under the *Electricity Act 1994* (Qld), require Ergon Energy to maintain its assets for several purposes, all of which are ultimately directed toward maintaining the quality, reliability and security of supply of standard control services and hence maintain the reliability and security of the distribution network. When considered in the context of Ergon Energy's other obligations under law, to achieve this objective, Ergon Energy must inspect, maintain, refurbish and/or replace its assets by having regard for their safety performance, their economic end of life and for the security of supply criteria.

In this way, the system operating expenditure that Ergon Energy proposes is necessary to maintain existing levels of safety, reliability, and security of the distribution system.

Meeting and managing expected demand for standard control services, as required by clause 6.5.6(a)(1), is the predominant objective of Ergon Energy's proposed system operating expenditure, the nature of which is described in Section 3 of this document. Ergon Energy's system operational activities are driven by legislative obligations and the deterioration and failure of assets over time. If not for Ergon Energy's proposed system operational expenditure, Ergon Energy would not be able to meet the expected demand for standard control services over the 2015-20 regulatory control period. The way in which Ergon Energy forecasts its system operational expenditure is based upon condition monitoring, inspections and the historical performance of the existing population of assets projected forward under the BST approach. In this way Ergon Energy is managing the forecast demand while maintaining not augmenting or improving the safety, reliability and security of the network. Operating expenditure criteria and factors

Clause 6.5.6(c) states:

The AER must accept the forecast of required operating expenditure of a Distribution Network Service Provider that is included in a building block proposal if the AER is satisfied that the total of the forecast operating expenditure for the regulatory control period reasonably reflects each of the following (the operating expenditure criteria):

(1) the efficient costs of achieving the operating expenditure objectives; and

(2) the costs that a prudent operator would require to achieve the operating expenditure objectives; and

(3) a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

Clause 6.5.6(e) goes on to state:

(e) In deciding whether or not the AER is satisfied as referred to in paragraph (c), the AER must have regard to the following (the operating expenditure factors):

(1) – (3) [Deleted]

(4) the most recent annual benchmarking report that has been published under rule 6.27 and the benchmark operating expenditure that would be incurred by an efficient Distribution Network Service Provider over the relevant regulatory control period;

(5) the actual and expected operating expenditure of the Distribution Network Service Provider during any preceding regulatory control periods;

(5A) the extent to which the operating expenditure forecast includes expenditure to address the concerns of electricity consumers as identified by the Distribution Network Service Provider in the course of its engagement with electricity consumers;

(6) the relative prices of operating and capital inputs;

(7) the substitution possibilities between operating and capital expenditure;

(8) whether the operating expenditure forecast is consistent with any incentive scheme or schemes that apply to the Distribution Network Service Provider under clauses 6.5.8 or 6.6.2 to 6.6.4;

(9) the extent the operating expenditure forecast is referable to arrangements with a person other than the Distribution Network Service Provider that, in the opinion of the AER, do not reflect arm's length terms;

(9A) whether the operating expenditure forecast includes an amount relating to a project that should more appropriately be included as a contingent project under clause 6.6A.1(b);

(10) the extent the Distribution Network Service Provider has considered, and made provision for, efficient and prudent non-network alternatives;

(11) any relevant final project assessment report (as defined in clause 5.10.2) published under clause 5.17.4(o), (p) or (s); and

(12) any other factor the AER considers relevant and which the AER has notified the Distribution Network Service Provider in writing, prior to the submission of its revised regulatory proposal under clause 6.10.3, is an operating expenditure factor.

The operating expenditure that Ergon Energy proposes to meet the objectives, in accordance with clause 6.5.6(a), reasonably reflects the criteria set out in clause 6.5.6(c) by reference to the factors in clause 6.5.6(e) as follows.

The efficient and prudent costs of achieving the objectives

Ergon Energy has developed its operating expenditure forecasts to ensure total operating expenditure for the regulatory control period reasonably reflects each of the operating expenditure criteria. Ergon Energy has demonstrated this by:

- Implementing a range of internal efficiency initiatives designed to deliver significant efficiencies reflected in the efficient base year.
- Adopting a BST approach with modest estimates of output and real price growth.
- Developing forecasts based on realistic expectations of demand, including independent verification of demand forecasts that underpin real price growth (i.e. by the consultancy SKM).
- Comparing with peer Network Service Providers for output growth and productivity growth factor calculations.

Table 26 summarises how Ergon Energy's operating expenditure forecast reflects the operating expenditure criteria.

Table 26: Reflecting the operating expenditure criteria

Operating expenditure criteria	Rule	Ergon Energy actions to ensure compliance
The efficient costs of achieving the operating expenditure objectives	6.5.6(c)(1)	Implemented a series of internal and external efficiency initiatives, as well as benchmarking analysis.
The costs that a prudent operator would require to achieve the operating expenditure objectives	6.5.6(c)(2)	Ergon Energy's operating expenditure forecasts demonstrate prudency through the application of a rigorous forecasting and planning process and a best practice investment governance framework which requires comprehensive cost benefit analysis to be undertaken to support project investment decisions. This process exists for network and corporate initiatives and requires consideration of alternatives and options analysis to inform the investment outcomes.
A realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.	6.5.6(c)(3)	Ergon Energy's load and customer forecasting methodologies are based on established forecasting practice and support the growth rates used to develop the forecast trends. Ergon Energy's real price cost inputs have been developed having regard to the electricity industry labour, commodity and asset price costs Indices'.

The efficient and prudent costs of achieving the objectives

Ergon Energy has had regard for the AER's interpretation of prudency and efficiency in assessing whether Ergon Energy's system operational expenditure reasonably reflects sub clauses 6.5.6(c)(1) and (2) in this Summary. In the *AER Explanatory Statement – Expenditure Forecast Assessment Guideline* the AER stated that:

'We consider that efficient costs complement the costs that a prudent operator would require to achieve the expenditure objectives. Prudent expenditure is that which reflects the best course of action, considering available alternatives. Efficient expenditure results in the lowest cost to consumers over the long term. That is, prudent and efficient expenditure reflects the lowest long term cost to consumers for the most appropriate investment or activity required to achieve the expenditure objectives.'[28]

In the context of forecasting Ergon Energy's system operational expenditure, Ergon Energy uses two approaches:

- Beginning with the mature framework Ergon Energy has established up to and including the base year (2012-13)
- Continuously improving actions in place and forecasts to deliver post the base year (2012-13).

[28] Australian Energy Regulator, *AER Explanatory Statement - Expenditure Forecast Assessment Guideline*, November 2013, available at http://www.aer.gov.au/node/18864, p 12.

Ergon Energy's decision making processes, and the way in which they achieve prudent outcomes, are demonstrated throughout its corporate policies, protocols, standards, Management Plans, Engineering Reports and associated supporting documentation and business-as-usual governance processes. It is Ergon Energy's stated intention to align with the *ISO55000 Asset Management Standard*, and to promote and support continuous improvement in its overall asset management processes. These represent the actions of a prudent operator.

Ergon Energy has developed objective methodologies to model the need for inspection and maintenance activities, based upon assessed risk, asset condition, age, actual performance history, and population performance, to establish prudent programs and targeted assets. Ergon Energy applies a BST approach on a base year of 2012-13 to determine an efficient forecast level of system operational expenditure. In simple terms, the BST methodology applied by Ergon Energy in preparing its operating expenditure forecasts consists of:

- selecting a base year
- making appropriate adjustments to remove certain non-recurrent items and movements in provisions
- making any further adjustments required to establish an efficient base year
- identifying and applying any recurrent step changes
- applying a rate of change consisting of output growth, real price growth and productivity growth to establish the trend.

Ergon Energy considers its system operational expenditure to be both prudent and efficient because it is based on mature strategies and practices with continuous improvement activities extended forward. Ergon Energy applies those efficient costs to the prudent actions it proposes to undertake so that its total system operational expenditure is both prudent and efficient. Furthermore, Ergon Energy believes that the forecast system operational expenditure is sustainable in the long term to meet the demand for standard control services and other forecast objectives.

A realistic expectation of the demand forecast and cost inputs required to achieve the objectives

Ergon Energy's load and customer forecasting methodologies are based on established forecasting practice and support the growth rates used to develop the forecast trends. Ergon Energy's real price cost inputs have been developed having regard to the electricity industry labour, commodity and asset price costs indices.

How Ergon Energy's operating expenditure forecast has regard for the operating expenditure factors

Ergon Energy's proposed operating expenditure reasonably reflects the prudent and efficient costs of achieving the objectives by having regard for the factors in clause 6.5.6(e) as follows:

In relation to sub clause (4), in September 2014 the AER decided to delay the release of its first benchmarking report under clause 6.27 until late November 2014, one month after the submission of this Regulatory Proposal. As a result, Ergon Energy has not been able to use it to inform its operating expenditure forecasts. Nevertheless, using the same publicly available information that will be used to develop the AER's benchmarking report[29], Ergon Energy commissioned an independent report to enable it to compare its performance and the

[29] Australian Energy Regulator, *Expenditure Forecast Assessment Guideline – Regulatory information notices for category analysis*, http://www.aer.gov.au/node/21843, accessed 22 August 2014.

performance of other network service providers, having regard for the unique qualities of Ergon Energy's network. This is prudent because Ergon Energy has quite unique cost drivers which should be considered when benchmarking performance. For further details, refer to the document, 'How Ergon Compares'.

In relation to sub clause (5), Ergon Energy has set out, in Tables 1 and 2 of this Summary, its system operational expenditure during the previous regulatory control period (2005-10) and actual and expected system operational expenditure in the current regulatory control period (2010-15). To accompany this information, in Section 2.1, Ergon Energy has explained the actual and expected system operational expenditure by reference to the allowance approved by the AER (and, for the 2005-10 regulatory control period, the QCA) and the endogenous and exogenous factors that have contributed to any variance from the AER's allowance.

In doing so Ergon Energy has demonstrated that its proposed system operational expenditure is efficient because it is broadly in line with the level of efficient system operational expenditure it has incurred in the current and prior regulatory control periods with reductions assessed as sustainable in the long term. Where its current or prior period expenditure has deviated from the AER's allowance, Ergon Energy has explained this by reference to drivers and circumstances that support the prudency and efficiency of the level of system operational expenditure that was actually incurred. This demonstrates the robustness of Ergon Energy's system of investment review controls, which ensures that Ergon Energy's system operational expenditure is continuously assessed for prudency and efficiency.

In relation to sub clause (5A), Ergon Energy has conducted a comprehensive program of customer engagement to identify the concerns of electricity consumers and ensure that its proposed system operational expenditure addresses those concerns. The results of Ergon Energy's engagement, and how they have informed its proposed system operational expenditure, are set out in this summary document and in the document 'Informing Our Plans, Our Engagement Program'.

In relation to sub clauses (6) and (7), Ergon Energy's proposed operating expenditure has been prepared in accordance with a rigorous forecasting and planning process and a robust governance framework to support project investment decisions. This process incorporates an assessment of opportunities for substitution between capital and operating expenditure to achieve more efficient investment outcomes. As described in Section 3.4, in the current period Ergon Energy has made considerable progress in improving its asset management practices, leading to better maintenance and renewal decisions and hence more efficient resourcing outcomes during the current regulatory period. This is particularly the case in maintenance and demand management where there are significant interactions between operating and capital expenditure. The operating expenditure forecast set out in Section 6 shows how Ergon Energy has built on these improvements in its proposed expenditure for the next regulatory control period.

In relation to sub clause (8), Ergon Energy notes that none of the schemes set out in clauses 6.5.8 or 6.6.2 to 6.6.4 of the Rules are applicable in the context of its proposed operating expenditure for the 2015-20 regulatory control period.

In relation to sub clause (9), Ergon Energy has robust procurement governance processes in place to ensure that contractual arrangements at all times reflect arm's length terms. It is noted that Ergon Energy's only subsidiary Sparq Solutions does not provide network services for operating expenditure that would constitute 'direct' costs and which would thus form part of the expenditure proposed in Section 6.

In relation to sub clause (9A), Ergon Energy's operating expenditure forecast does not include an amount relating to a project that should more appropriately be included as a contingent project under clause 6.6A.1(b). Contingent projects in the next regulatory control period are described in the ‘Contingent Projects’ document.

In relation to sub clause (10), Ergon Energy adopts NNA to achieve both statutory and strategic purposes. As required by clause 5.17.4 of the Rules, Ergon Energy must apply the Regulatory Investment Test (RIT-D) (previously the Regulatory Test) for capital expenditure augmentation projects greater than $5 million or asset renewal projects where there is an augmentation component greater than $5 million. As part of this test, Ergon Energy must consider adopting non-network solutions where it is prudent and efficient to do so. Ergon Energy identifies potential projects in the development of its ‘Distribution Annual Planning Report’.

Additionally, Ergon Energy has provided an overview of the demand management strategic directions and activities for the control period in the ‘Demand Management Overview 2015 to 2020’. This document sets out the programs, activities and capabilities required to capture demand reduction potential and hence avoid network capital expenditure and reduce network risks. How Ergon Energy assesses these non-network alternatives is described in the ‘Demand Management Overview 2015 to 2020’, which forms part of this Regulatory Proposal. Demand management solutions are considered in response to system capital investment by ascertaining if security of supply can be maintained through demand management activities rather than traditional asset construction. The demand management operational expenditure set out in Section 6.6 describes Ergon Energy’s forecast costs to offset system capital expenditure using NNA in the next regulatory control period.

In relation to sub clause (11), Ergon Energy is required to develop a final project assessment report under 5.17.4(o), (p) or (s) as part of the RIT-D. Ergon Energy will apply the RIT-D to applicable projects in the 2015-20 period as required by the Rules. Ergon Energy notes that no projects have been subjected to the RIT-D to date and hence there are no relevant final project assessment reports for Ergon Energy to have in regard to its proposed operating expenditure for the 2015-20 period.

In relation to sub clause (12), Ergon Energy has not been notified of any other factor the AER considers relevant and has notified Ergon Energy is an operating expenditure factor.

8. Appendices

Definitions, acronyms, and abbreviations

1. Definitions

Term	Definition
ABB switches	Switchgear manufactured by Asea Brown-Boveri
Base-Step-Trend	Forecasting methodology useed for operating expenditure forecasting
Ellipse	Centralised resource-planning database used to manage internal and external resources, including assets, maintenance schedules, financial resources, materials and human resources
Enterprise Resource Planning	A collection of software programs that tie together an enterprise’s various functions, such as human resources, finance, works management and asset management
GoogleEarth™	A virtual globe, map and geographical information program
Plant Smart	A partnership between Ergon Energy and Greening Australia Queensland that aims to improve the safety, reliability, and efficiency of energy supply by improving the management of vegetation and community awareness of vegetation issues around powerlines
ROAMES aerial LiDAR program	Remote Observation Automated Modelling Economic Simulation program that captures aerial light and radar images over the entire powerline infrastructure

2. Acronyms and abbreviations

The following abbreviations and acronyms appear in this summary document.

Abbreviation or acronym	Definition
ACS	Alternative Control Services
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CNOC	Communications Network Operation Centre
DCODE	Description and Cost of Decentralised Energy
DMIA	Demand Management Innovation Allowance
GIS	Geographic Information System
LiDAR	Light Detection And Ranging
MST	Maintenance Scheduled Task
NER	National Electricity Rules
NNA	Non-Network Alternatives
QCA	Queensland Competition Authority
RIT-D	Regulatory Investment Test for Distribution
ROAMES	Remote Observation Automated Modelling Economic Simulation
SCS	Standard Control Services

References

1. Compliance documentation

Name	Description
Codes of Practice	Codes of practice provide practical guidance for people who have electrical safety duties about how to achieve the standards required under the *Electrical Safety Act 2002* (Qld) and about effective ways to identify and manage electrical safety risks.
Distribution Authority	Licence issued by the Queensland State Government to Ergon Energy pursuant to the *Electricity Industry Act 1994* (Qld) to undertake electricity distribution activities in Queensland.
Electrical Safety Act 2002 (Qld)	State legislation directed at eliminating the human cost to individuals, families and the community of death, injury and destruction that can be caused by electricity.
Electrical Safety Regulation 2013	The *Electrical Safety Regulation 2013* identifies specific ways to meet electrical safety duties under the *Electrical Safety Act 2002* (Qld) and establishes requirements for electrical work; licensing; installations; equipment; supply; safety management systems; cathodic protection systems; and incident notification and reporting.
Electricity Act 1994 (Qld)	State legislation governing the supply, distribution, sale and use of electricity in Queensland.
ISO55000 Asset Management Standard	An international suite of standards that provides guidance in asset management best practise and focuses on developing proactive lifecycle asset management system.
National Electricity Rules	Statutory instrument made under the *National Electricity (South Australia) Act 1996* governing the National Electricity Market and the regulation of market participants including Ergon Energy.
Work Health and Safety Act 2011 (Qld)	State Legislation governing the provision of a balanced and nationally consistent framework to secure the health and safety of workers and workplaces.

2. Strategic documentation

Name	Description
Network Optimisation Asset Strategy	The Network Optimisation Asset Strategy specifies objectives and outcomes that provide the link between the high-level aspirations and guiding principles articulated in the Asset Management Policy and the operational and tactical aspects within the asset management plans.
Vegetation and Access Tracks Management Strategy 2015-20	This document outlines the strategy that Ergon Energy will adopt for vegetation and access track management during the AER regulatory period 2015-20. The strategy applies to maintenance of vegetation and access track condition relating to the Ergon Energy overhead distribution network.

3. Management Plans

These documents describe, for the stated asset type, Ergon Energy's approach to managing their assets, cognisant of appropriate legislation, regulatory obligations, asset management strategies and internal and external standards. They are developed pursuant to Ergon Energy's broader 'Network Optimisation Asset Strategy'.

Further these documents detail the key projects and programs underpinning activities for the period 2013-14 to 2019-20 and the basis upon which Ergon Energy derives its capital expenditure and operating expenditure forecasts.

Name
Auxiliary Substation Components Management Plan
Earthing Systems Management Plan
Metering Management Plan
Network Communications Infrastructure Management Plan
Network Operations Management Plan
Operational Building and Sites Management Plan
Overhead and Underground Plant and Equipment Management Plan
Overhead Feeder Circuits
Protection and Control Management Plan
Public Lighting Management Plan
Underground Feeder Circuits Management Plan
Vegetation and Access Tracks Management Plan
Zone and Bulk Supply Plant and Equipment Management Plan

4. Supporting documentation

Name	Description
Defect Classification Manuals • Lines Defect Classification Manual • Substation Defect Classification Manual	These manuals define the Ergon Energy defect classification and prioritisation requirements for recording defects during an asset inspection.
Demand Management Overview 2015-2020	This document comprises an overview of Ergon Energy's proposed demand management activities for the regulatory control period 2015 to 2020. As well as the targets and expenditure forecast, this document contains a summary of activities, strategies, risks, drivers and operation of demand management throughout Ergon Energy's network.
Distribution Network Augmentation Plan	This plan states the capital works that are required to meet the augmentation requirements of Ergon Energy's distribution networks in order to accommodate the normal load forecasts for the next 10 years. It forms the initial stage of the annual augmentation capital works program that is developed as part of the Ergon Energy capital budgeting process.
Forecast Expenditure Summary – Operating Costs	The purpose of this document is to provide a detailed description of Ergon Energy's operating expenditure forecasting process, including its application of the BST methodology. This document also demonstrates how Ergon Energy's operating expenditure forecasts meets the operating expenditure objectives, criteria and factors under the NER.
Forecast Expenditure Summary Corporation Initiated Augmentation 2015 to 2020	The purpose of this summary document is to explain and justify Ergon Energy's Corporation Initiated Augmentation capital expenditure for the next regulatory control period, 1 July 2015 to 30 June 2020.
Forecast Expenditure Summary Unit Cost Methodologies 2015 to 2020	The purpose of this summary document is to explain and justify the methodologies applied by Ergon Energy to develop unit cost estimates for its SCS and ACS for the next regulatory control period, 1 July 2015 to 30 June 2020.
Informing Our Plans, Our Engagement Program	The document, Informing Our Plans, Our Engagement Program, details the engagement program and the customer insights used to inform our Regulatory Proposal. It supports the document, An Overview, Our Regulatory Proposal and the main Regulatory Proposal.
Standard for Preventive Maintenance Programs	This document outlines the asset management standards underpinning the Preventive Maintenance Programs and Work Plans with Ergon Energy for the 2015-16 to 2019-20 regulatory control period.
Sub transmission Network Augmentation Plan	This plan states the capital works that are required to meet the augmentation requirements of Ergon Energy's sub-transmission networks in order to accommodate the normal load forecasts for the next 10 years. It forms the initial stage of the annual augmentation capital works program that is developed as part of the Ergon Energy capital budgeting process.