Expenditure Forecasting Methodology

29 June 2018

Part of the Energy Queensland Group

CONTENTS

1 INTRODUCTION

This Expenditure Forecasting Methodology outlines the methodologies that Energex and Ergon Energy Network (Ergon Energy) propose to use to prepare the operating expenditure (opex) and capital expenditure (capex) forecasts in the 2020-25 regulatory proposals that are to be submitted to the Australian Energy Regulator (AER) in January 2019. This document has been prepared for submission to the AER in June 2018, as required under clause 6.8.1A of the National Electricity Rules (NER).

The purpose of this document is to inform stakeholders about Energex and Ergon Energy forecasting methodologies, and to consult with them about the application and the resultant forecasts, prior to Energex and Ergon Energy submitting our regulatory proposals to the AER. Should this engagement lead to a change in the methodologies that Energex and Ergon Energy use to prepare our forecasts, the reasons for any change will be explained in the regulatory proposals.

The details contained in this document are based on the information available at the time of publication and reflect the alignment of forecasting approaches across the Energex and Ergon Energy distribution networks following the establishment of Energy Queensland Limited (Energy Queensland).

1.1 Our engagement with customers

Energex and Ergon Energy have established a comprehensive customer engagement program to support the development of the 2020-25 regulatory proposals.

The aim of the program is to understand and translate customers' needs, expectations and values into the evidence-based decisions that underpin the regulatory proposals. As part of the program of customer engagement, we have been consulting with the Regulatory Proposal And Tariff Structure Statement Working Group of the Customer Council on our forecasting methodologies.

This Expenditure Forecasting Methodology will be published at www.talkingenergy.com.au and Energex and Ergon Energy welcome any feedback on it. Comments on this document should be sent to AER2020@energyq.com.au, or submitted via www.talkingenergy.com.au.

1.2 About our networks

Energy Queensland is a Queensland Government Owned Corporation that operates a group of businesses that provide energy services across Queensland, including:

- Distribution Network Service Providers (DNSP), Energex and Ergon Energy;

- a regional service delivery retailer, Ergon Energy Queensland Pty Ltd (Ergon Energy Retail); and

- affiliated contestable business Yurika Pty Ltd.

The distribution networks, which are part of the National Electricity Market, are regulated by the AER.

Energy Queensland was created in July 2016 as part of the Queensland Government's electricity industry reforms. This allowed the Energex and Ergon Energy to operate under a common management team. The driving force behind the reform is to provide more

efficient outcomes for customers and to create an energy business that is ready for the future.

1.2.1 The Energex distribution network

Energex manages an electricity distribution network which delivers world-class energy products and services to one of Australia's fastest growing communities – the south-east Queensland region. Energex provides distribution services to almost 1.4 million domestic and business connections, delivering electricity to a population base of around 3.4 million people via 52,000 kilometres of overhead and underground network.

1.2.2 The Ergon Energy distribution network

Ergon Energy manages an electricity distribution network which supplies electricity to over 730,000 customers. The vast operating area covers over one million square kilometres – around 97 per cent of Queensland – from the expanding coastal and rural population centres to the remote communities of outback Queensland and the Torres Strait.

The electricity network consists of approximately 160,000 kilometres of powerlines and one million power poles, along with associated infrastructure such as major substations and power transformers. Ergon Energy also owns and operates 33 stand-alone power stations that provide supply to isolated communities across Queensland which are not connected to the main electricity grid.

3 OUR INVESTMENT APPROACH DRIVERS AND INPUTS

The purpose of our expenditure is to safely deliver secure, affordable and sustainable energy solutions with our customers and communities. Our focus over the forthcoming period is to deliver:

- Sustainable investment to avoid the historical boom-bust cycle and manage aged assets, and continued cost efficiencies;

- Improved community and staff safety, by leveraging innovative solutions to transition to an intelligent grid and manage asset safety risks and severe weather events; and

- Investments that enable and leverage the availability of distributed energy solutions – including both grid scale and small solar generators, and energy storage solutions.

3.1 Drivers of Expenditure

The majority of our expenditure is dedicated to building, maintaining, operating and replacing electrical assets. The key drivers of expenditure are set out below:

- Connecting customers;

- Security, performance and reliability needs of customers;

- Actively managing vegetation near our assets;

- Maintaining assets to ensure that they are operating safely and efficiently over their lifetimes;

- Transitioning to an intelligent grid capable of meeting customers' future needs;

- Investing in modern systems and tools to efficiently run our business and deliver services to our customers; and

- Competitive alternatives including non-network solutions.

Our expenditure forecasts are developed based on these drivers through an efficient mix of capex and opex to manage overall network risk.

3.2 Investment Approach

A five-tier governance process exists to oversee our investments on the distribution networks, including:

1. **Asset Management Strategy & Policy**: Alignment of future network development and operational management with Energy Queensland strategic direction and policy frameworks to deliver best practice asset management. This guides operational plans and work to implement the strategy;
2. **Program of Work (PoW) Strategy & Plan**: High level expenditure targets and forecasts approved by the Board as part of the five year Corporate Plan and the Statement of Corporate Intent, required to deliver the Asset Management Objectives;
3. **Network Investment Portfolio**: Our investment optimisation process considers the portfolio of all projects and programs proposed for inclusion in the future PoW on a consistent basis by:
   - Reviewing programs and projects to ensure they are individually justified and assess the justification relative to drivers, risks, cost and performance targets;
   - Reviewing the risks of each of the proposed programs or projects were not to proceed, and how the untreated risk could be otherwise managed to tolerable levels; and

- Optimising the portfolio of proposed programs and projects to deliver the appropriate balance between risk, resources (including cost), and achievement of service performance targets.

    The optimised programs and projects are submitted annually to the Risk and Compliance Committee for endorsement prior to approval of the EQL Board. This Committee oversees prudent and efficient expenditure to ensure service performance outcomes meet the reasonable expectations of the community and comply with Energex and Ergon Energy's legal and regulatory obligations;

4. **Project and Program Approval**: Individual projects and programs are overseen by senior management and subject to an investment approval process, requiring business cases to be approved by an appropriate financial delegate. The development of programs and projects is undertaken by the PoW Development & Review Forum and is in compliance with the relevant EQL policy, protocols and standards; and

5. **PoW Performance Reporting**: Specific corporate Key Result Areas have been developed to ensure that the PoW is being effectively delivered and ensures that performance standards and customer commitments are being met. The Network Operations and Steering Committee meets on a monthly basis to review operational and financial performance, and provides direction to resolve issues.

3.3 Opex-capex trade-offs

The benefits that flow from prudent and efficient capex include minimising current and future electricity costs, a safe network, compliance with accounting standards, modern assets with increased performance and lower maintenance costs. These are assessed against the benefits provided by responding to emerging network needs through opex on sustained or increased maintenance or to facilitate non-network solutions as an alternative to augmentation.

Throughout the expenditure forecasting process, Energex and Ergon Energy systematically consider the trade-offs between opex and capex in the following ways:

- Design and maintenance standards;

- Decisions to renew, replace or maintain assets;

- Equipment specification and purchasing;

- Investment in assets that will function in the expected longer-term climate change scenarios and are appropriate for the challenging Queensland operating environment; and

- Demand management programs including application of the Regulatory Investment Test for Distribution to seek non-network and competitive alternatives to network-based capital projects.

This approach ensures that the efficient trade-off between opex and capex has been considered at both an individual component level (e.g. equipment specification), a project level (e.g. replacement decisions) and a network level (e.g. our demand management programs).

3.4 Key inputs

The key inputs that are used in developing the expenditure forecasts. These are summarised in Table 1 – Key inputs

Table 1 – Key inputs

Item	Description
Customer engagement	The outcomes of the engagement program are used as an input to provide details on customer expectations regarding level of services, reliability and investment.
Demand, energy and customer numbers	The base case network peak demand forecast is used to forecast network augmentation capex and a base case customer number forecast is used to forecast connections and customer initiated capital works. Customer numbers and peak demand are used to inform the opex forecasts. It is expected that actual maximum demand, energy and customer connection growth will not vary materially from the forecasts.
Base year (opex)	The financial year 2018-19 has been selected for use as the base year for the opex forecast as it is expected to reflect the most relevant and up-to-date expenditure information at the time of the AER's final decision.
Cost escalators	Cost escalators are applied to reflect changes in labour, material and contractor costs. An independent expert will forecast appropriate escalation rates.
Forecast inflation	Inflation will be forecast using short term forecasts from the Reserve Bank of Australia's (RBA's) statement of monetary policy and then the midpoint of the RBA's target inflation range.
Unit rates and project estimates	Unit rates and project estimates are used to develop bottom-up forecasts, where appropriate. An independent expert will be engaged to provide advice and review unit rates to advise whether these are reasonable and reflect prudent and efficient operations.
Asset information and Network Performance Data	A combination of age, condition, and performance history is used to inform asset-related risk and develop programs of work that manage risk to tolerable levels with a focus on safety, legislated requirements and customer impacts.
Safety Obligations	The *Electrical Safety Act 2002* (Qld) (Safety Act) and *Electrical Safety Regulation 2013* (Qld) (Safety Regulation) provide the legislative framework for electrical safety in Queensland and are administered by the Electrical Safety Office (ESO). The fundamental principle of the legislation is to set legal requirements to ensure the electrical safety of licensed electrical workers, other workers, licensed electrical contractors, consumers and the general public.
Distribution Authority	The Distribution Authorities include sections that set minimum service levels through a combination of the Minimum Service Standard, Safety Net and Improvement Program (also known as Worst Performing Feeders Program).
Network Transformation Opportunities	New innovations, system, tools or products that demonstrate the potential to change the way we plan, operate and maintain our network and provide services to customers. Examples include non-network solutions, LiDAR and Demand Side Response.

4   OPERATING EXPENDITURE

This section explains the methods that Energex and Ergon Energy propose to use to forecast our efficient opex for the next regulatory period. It explains:

- the opex categories, and

- the specific forecasting method to be applied for each capex category.

4.1 Opex categories

Energex and Ergon Energy must present their opex forecast for Standard Control Services (SCS) in six categories for the purpose of the AER's Category Analysis and Reset Regulatory Information Notice (RIN) reporting, as detailed in Table 2.

Table 2– Opex categories for SCS

RIN Category	Service Description	Forecast method
Vegetation management	• Planned programs and reactive maintenance activities in managing vegetation to provide a safe and reliable network	Base-step-trend
Maintenance	• Inspection programs to detect potential defects requiring remedial response. • Maintenance plans to ensure delivery of supply, reliability, security and safety objectives.	Base-step-trend
Emergency response	• Works undertaken after a failure of an asset to either restore the network to a state in which it can perform its required function or render the installation safe • Repair of damaged equipment and all storm-related repairs.	Base-step-trend
Non-network	• Expenditure relating to IT and communications assets, non-network buildings and property assets , non-network buildings, fittings and fixtures, and other non-network assets	Base-step-trend
Network overheads	• Overhead costs including the provision of network, control and management services that cannot be directly identified with a specific operational activity (eg. network management, planning, network control and operational switching personnel, quality and standards functions, network billing, customer services, demand side management, levies etc.)	Base-step-trend (except GSL payments)
Corporate overheads	• Provision of corporate support and management services by the corporate office that cannot be directly identified with specific operational activity (eg. executive management, legal, HR, finance, debt raising etc)	Base-step-trend (except debt raising)

Energex and Ergon Energy will also present their opex forecasts for Street Lighting and Metering (Alternative Control Services (ACS)).

4.2 Overview of opex forecasting approach

The majority of our opex is forecast using the Base-Step-Trend (BST) method. This approach is described in the AER's Expenditure Forecasting Assessment Guideline and was used to set the opex allowance for the current regulatory period.
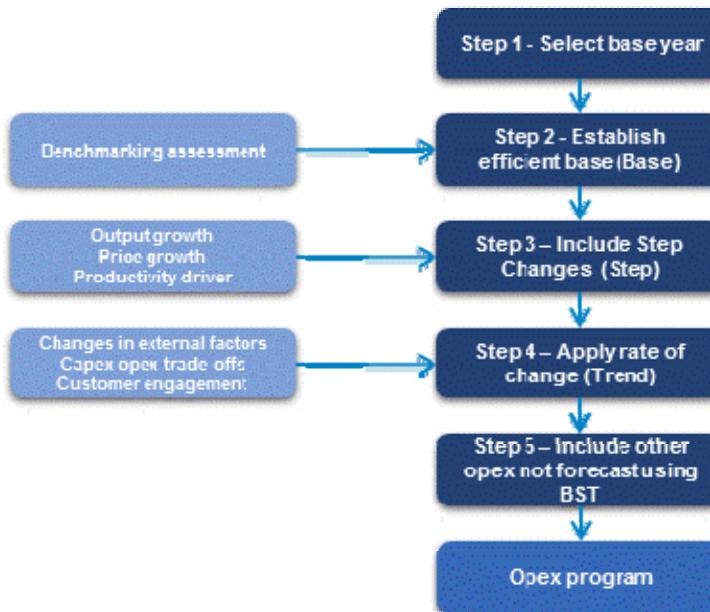
The remaining opex is forecast through a variety of methods including, benchmarking, market testing and bottom up forecasts where appropriate.

The process for developing the opex forecasts is set out below and summarised in Figure 1.

Figure 1 – Opex forecasting process

Step 1 – Select base year

The initial step in preparing a BST opex forecast is to select a base year that represents a realistic expectation of the efficient and sustainable on-going level of opex that is required to provide network services in the next regulatory period. The AER has indicated a preference for using the most recent year for which audited data is available.

The AER is expected to make its distribution determinations for Energex and Ergon Energy in April 2020. As a result, we consider that 2018-19 will be the most representative year to serve as a starting point for forecasting prudent and efficient opex.

Energex and Ergon Energy will be part way through the 2018-19 financial year when the regulatory proposals are submitted to the AER in January 2019. Therefore, the proposals will use a partial forecast for the 2018-19 base year opex but will be updated with actual audited 2018-19 opex in the revised regulatory proposals, which will be available at the time of the AER's final decision.

This is consistent with the approach taken by the AER in recent determinations.

Step 2 – Establish efficient base year

Energex and Ergon Energy will adjust the 2018-19 base year opex as follows:

- add or subtract for changes in service classification;

- subtract specific one-off or unusual events, which are not representative of a typical year of recurrent opex in the next regulatory period;

- add any opex that is not appropriately accounted for in the base year but which will be incurred in the next regulatory period, including for estimated efficient incremental costs associated with the 2019-20 regulatory year, and

- subtract opex that is not being forecast using the BST method – this is discussed in step 5 below.

Page 9 of 15

Ergon Energy Corporation Limited ABN 50 087 646 062
Energy Queensland Limited ABN 96 612 535 583
Energex Limited ABN 40 078 849 055

Step 3 – Adjust for step changes

Energex and Ergon Energy may need to include step changes in our opex forecasts to account for events or obligations that will occur in the next regulatory period which either increase or decrease our opex relative to the base year.

Step changes can arise from:

- changes in external factors outside of Energex and Ergon Energy's control, including new regulatory and legislative obligations;

- capex/opex trade-offs, which move expenditure between capex and opex; and

- customer engagement, which respond to specific customer requests or needs that impact how Energex and Ergon Energy provide network services, but which are not otherwise reflected in the base year opex.

Step 4 – Adjust base opex for rate of change

The base year opex will reflect Energex and Ergon Energy's outputs, prices and productivity levels as at 2018-19. Therefore, the base year for each network needs to be adjusted to reflect the expected outputs, prices and productivity in the next regulatory period. To do this, we expect to account for:

- output growth based on changes in customer numbers, circuit length and ratcheted maximum demand;

- real price growth based on expected real changes in labour, contractor and material prices, and

- productivity growth having regard for benchmarking outcomes, management savings targets, and adjustments made for other DNSPs in recent regulatory determinations.

Step 5 – Include other opex not forecast using BST method

Energex and Ergon Energy intend to forecast the following components of our opex using alternative approaches to the BST method:

- debt raising costs – Energex and Ergon Energy will adopt a debt raising cost unit rate, as measured in basis points, which will be multiplied by the assumed level of debt at the start of a year to determine the debt raising costs for that year. This unit rate may be based on advice from an independent expert, and/or having regard for the AER's recent regulatory determinations for other DNSPs; and

- guaranteed service levels (GSL) payments – Energex and Ergon Energy will forecast the costs they expect to incur under the Queensland Electricity Distribution Network Code for GSL payments based on historical experience adjusted for any changes to that code or expected volumes.

4.3 Validating the opex forecast

Energex and Ergon Energy also develop bottom up opex forecasts based on a combination of demand analysis, unit rate reviews and market testing. These forecasts are essential for planning and delivery of our annual opex programs. They also allow us to validate the BST forecast and allocate it appropriately across opex categories.

5 CAPITAL EXPENDITURE

This section explains the methods that Energex and Ergon Energy propose to use to forecast our prudent and efficient capex for SCS and ACS for the next regulatory control period. It:

- Explains the capex categories;
- Overviews the overall approach to capex forecasting, and
- Explains the specific forecasting method to be applied for each capex category.

5.1 Capex categories

Energex and Ergon Energy are required to present capex forecasts for SCS in six categories for the purpose of the AER's Category Analysis RIN reporting, as described in Table 3.

Table 3 – Capex categories

RIN Category	Expenditure Category Elements	Service Description
Replacement expenditure (Repex)	Corporation initiated replacement & refurbishment of network assets.	• maintaining the existing level of supply and standard of service by replacement or renewal of assets that are no longer capable of delivering their designed purpose.
Connections (Connex)	Customer initiated capital works to deliver services to: • Connect residential customers to the network; upgrade existing connections; and provide service to connect small scale embedded generation (PV)	• timely and cost efficient connection of new customers to the distribution network and/or changes to existing small customer connections.
Augmentation expenditure (Augex)	Corporation initiated capital works to reinforce or grow the network to increase: • Capacity • Reliability • Power Quality; and • Secondary Systems	• maintaining the existing level of supply and standard of service by addressing increases in peak demand, additional load, fault levels, reliability and power quality requirements within the network, including the purchase of operational land and easements
Non-network	ICT Motor vehicles Buildings and property Other	• capex not directly related to the construction or replacement of system assets but which supports the operation of the regulated network business
Capitalised network overheads	Network overheads	• Overhead costs including the provision of network, control and management services that cannot be directly identified with a specific activity
Capitalised corporate overheads	Corporate overheads	• Provision of corporate support and management services by the corporate office that cannot be directly identified with specific activity

Energex and Ergon Energy will also present their capex forecasts for Street Lighting and Metering (ACS).
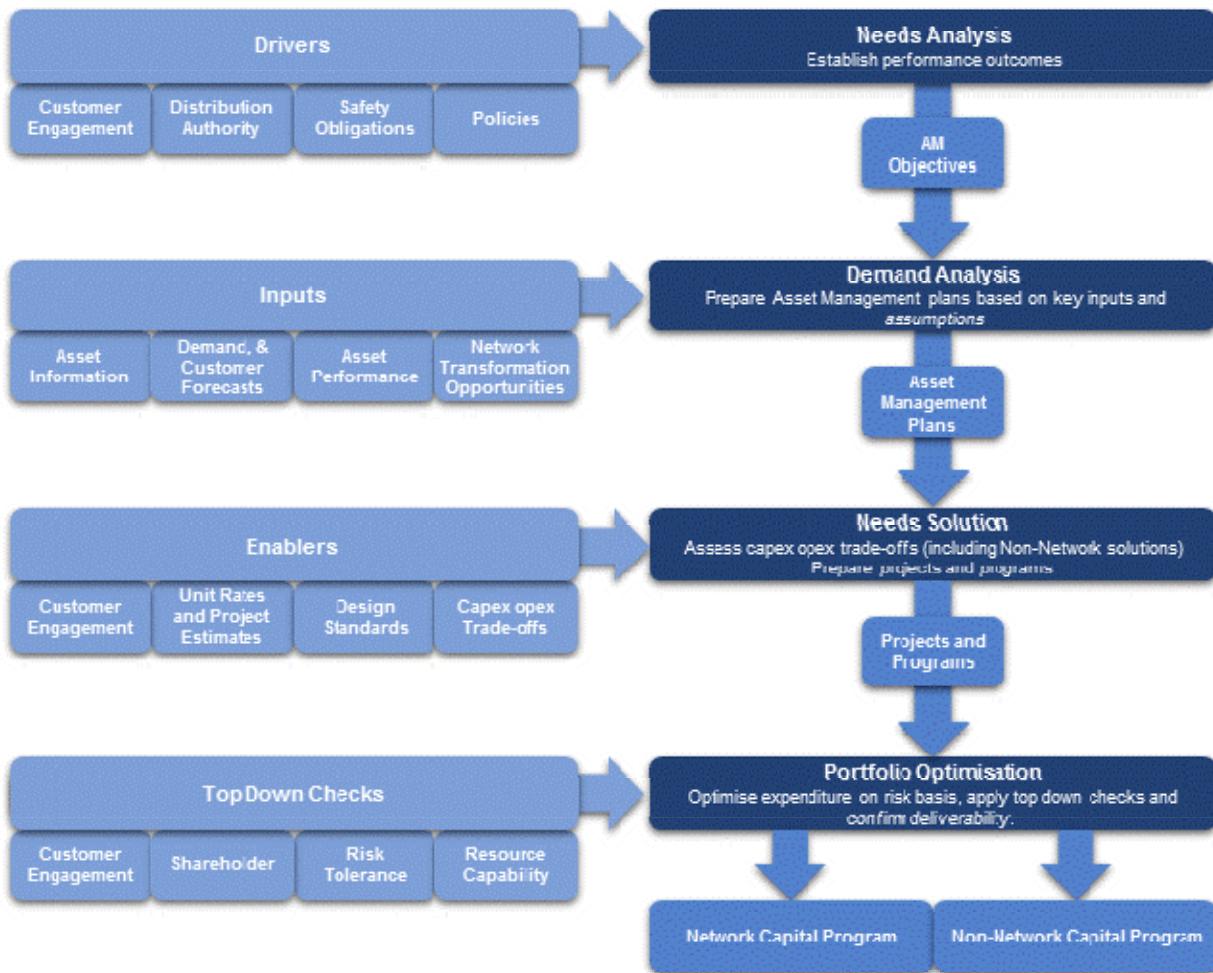
5.2 Overview of capex forecasting approach

Energex and Ergon Energy use a mix of bottom-up and top-down methods to forecast capex, as discussed below in section 5.4. This general approach is illustrated in Figure 2 and includes the following steps:

- Needs Analysis – establishing network performance outcomes to deliver organisational targets, including areas such as safety performance, responsibilities to the environment, financial outcomes and commitments to customers, as well as obligations to the community.

- Demand Analysis – critically review key inputs such as asset condition information, network demand growth and new technology against established performance outcomes to determine area requiring intervention.

- Needs Solutions – prepare capital projects and programs that address the identified needs. This step includes capex opex trade-offs and investigation of non-network solutions with the potential to defer the timing of major projects.

- Portfolio Optimisation – reconcile projects and programs against top-down expenditure targets and optimise having regard for a tolerable network risk profile.

Figure 2 – Capex forecasting process

Page 13 of 15

Ergon Energy Corporation Limited ABN 50 087 646 062
Energy Queensland Limited ABN 96 612 535 583
Energex Limited ABN 40 078 849 055

5.3 Network and Corporate Overheads

Energex and Ergon Energy propose to use the BST method to forecast their expenditure for network and corporate overheads. This is the same method as is proposed to forecast the overheads components of opex for the next regulatory period, as set out in section 4.

5.4 Types of capex forecasting methods

Energex and Ergon Energy use five broad methods to forecast capex in the six categories detailed in section 5.1:

- Scoped capex – this bottom-up method involves scoping and costing individual projects;
- Program capex – this bottom-up method involves forecasting volumes of work and unit costs for programs of work for different asset classes;
- Pooled capex – this top-down method involves forecasting categories of capex at an aggregate level, such as based on a prior year's expenditure or historical trends; and
- BST capex – this top-down method involves applying a similar approach to forecast capex categories to the approach proposed for opex.

Table 4 summarises the forecasting methods that Energex and Ergon Energy propose to use for each capex category.

Table 4 – Forecasting methods by capex categories

Expenditure type	Scoped	Program	Pooled	BST
Repex	✓	✓		
Augex	✓	✓		
Connex		✓	✓	
Non-Network	✓	✓	✓	✓
Network Overheads				✓
Corporate Overheads				✓

APPENDIX A – DEFINITIONS, ABBREVIATIONS AND ACRONYMS

Term	Definition
ACS	Alternative Control Services, the services that are provided in response to a customer request. The cost of these services is recovered through specific charges to the individual customers who require the service.
AER	Australian Energy Regulator
Augex	Augmentation capex
BST	Base-step-trend, the AER's preferred forecasting method for total opex forecasts.
Capex	Capital expenditure
Connex	Connections capex
DNSP	Distribution Network Service Provider
Energy Queensland	Energy Queensland Limited, the legal entity for the Energy Queensland Group, which is the parent company of both Energex and Ergon Energy
Expenditure Forecasting Assessment Guideline	The AER's guideline that describes how it will assess distribution network service providers' expenditure forecasts
GSL	Guaranteed service level, as specified in the Queensland Electricity Distribution Network Code, such that Energex and Ergon Energy are required to make payments to customers for whom these levels are not achieved.
NER	National Electricity Rules
Opex	Operating expenditure
PoW	Program of work
Repex	Replacement capex
RIN	Regulatory Information Notice
SCS	Standard control services, the common distribution services provided using the shared Energex and Ergon Energy Network networks. The costs of these services are recovered through network tariffs.