APPENDIX 19

Expenditure forecasting methodology

Energex

Expenditure Forecasting Methodology

November 2013

energex

positive energy

Version control

Version	Date	Description
Final 1.0	25/11/2013	Final version for submission to the AER

Energex Limited (Energex) is a Queensland Government Owned Corporation that builds, owns, operates and maintains the electricity distribution network in the region of South East Queensland. Energex provides distribution services to almost 1.3 million connections, delivering electricity to 2.8 million residents and businesses across the region.

Energex's key focus is distributing safe, reliable and affordable electricity in a commercially balanced way that provides value for its customers, manages risk and builds a sustainable future.

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Figures and Tables

1 Introduction

This document outlines Energex Limited's (Energex's) expenditure forecasting methodology for both operating expenditure (opex) and capital expenditure (capex) as required by clause 6.8.1A of the National Electricity Rules (*the Rules*).

RULE REQUIREMENT

Clause 6.8.1A Notification of approach to forecasting expenditure

(a) A Distribution Network Service Provider must inform the AER of the methodology it proposes to use to prepare the forecasts of operating expenditure and capital expenditure that form part of its regulatory proposal.

(b) A Distribution Network Service Provider must submit the information referred to in paragraph (a):

(1) At least 24 months before the expiry of a distribution determination that applies to the Distribution Network Service Provider; or

(2) If no distribution determination applies to the Distribution Network Service Provider, within 3 months after being required to do so by the AER.

Expenditure forecasts will form part of Energex's 2015-20 regulatory proposal. Under the transitional arrangements that apply to Queensland, Energex must submit the proposed expenditure forecasting methodology to the Australian Energy Regulator (AER) by 30 November 2013.

The details discussed in this document are based on the best information at the time of publication and covers standard control services only.

The expenditure categories are based on the categories Energex currently reports to the AER through its annual Regulatory Information Notice (RIN). Energex recognises that these categories may change following the publication of the AER's Expenditure Forecast Assessment Guideline for electricity transmission and distribution.

Energex welcomes feedback on this expenditure forecasting methodology. All feedback will be reviewed and considered during the development of Energex's 2015-20 regulatory proposal. Comments on this document should be sent by email to customerengagement@energex.com.au.

2 Service standards and regulatory obligations

The service standards and regulatory obligations relating to Energex's operating and capital expenditure forecasts include:

- Clauses 6.5.6 and 6.5.7 of *the Rules* which outline the operating and capital expenditure objectives and criteria.
- Clause 6.8.1A of *the Rules* which requires Energex to submit information relating to the methodology used in preparing the expenditure forecasts.
- Clause 5.13.2 of *the Rules* which requires Energex to publish an annual network performance document, the Distribution Annual Planning Report (DAPR). The DAPR is supported by Energex's asset maintenance policies. These policies integrate Energex's mandatory obligations and internal policies on work programs and initiatives to ensure that Energex meets its statutory and regulatory obligations.
- The *Electricity Act 1994* (Qld) and *Electricity Regulations 2006* (Qld) together with the *Electrical Safety Act 2002* (Qld) and *Electricity Safety Regulations 2002* (Qld), which set the technical parameters for the safe operation of Energex's distribution network.
- Section 127C of the *Electricity Regulations 2006* (Qld), which requires Energex to submit an annual Demand Management Plan to the Department of Energy and Water Supply (DEWS). The plan includes the long term strategy for demand management and the proposed initiatives for the next financial year.
- Queensland's Electricity Industry Code (EIC), which outlines Minimum Service Standard (MSS) levels for assessment against feeder reliability performance.

3 Current operating environment

Since Energex submitted its 2010-15 regulatory proposal in 2009 there has been considerable change in the regulatory and economic environment confronting the organisation. In particular, in response to sharp increases in electricity prices, changes have been implemented at the jurisdictional and national level aimed at moderating future price increases. Central to these changes is the promotion of improved customer engagement in network development and a heightened emphasis on increased efficiency in the provision of network services.

At the State level, the Queensland Government has instituted measures within the current regulatory control period aimed at reducing costs, including the Electricity Network Capital Program Review (ENCAP) which identified capital expenditure savings over the remainder of the 2010-15 regulatory control period. In addition, earlier this year the Queensland Government published reports and recommendations identifying further reforms across the network businesses in the lead-in to the 2015-20 regulatory review. These included changes to organisation structures, potential reductions to network security and reliability standards and recommendations in relation to industry practices and operation.

Energex expects that the details of some of its individual forecasting methodologies will evolve to reflect these and impending business reforms and regulatory changes.

Energex has assessed and incorporated a number of changes to the opex and capex forecasting methodologies. These changes have taken into account the issues and concerns raised by the AER in previous regulatory determinations as well as information contained in the AER's draft Expenditure Forecast Assessment Guideline.

However, there may be other key changes which are not yet known or finalised. These changes will be incorporated into the methodologies as necessary. More broadly, Energex will continue to work to ensure that its expenditure programs reflect stakeholder expectations.

4 Energex guiding principles

4.1 Balanced commercial outcomes framework

Energex's strategic objective is to achieve balanced commercial outcomes by understanding and effectively managing the customer, risk management and financial elements of the organisation. This is represented in Figure 4.1.

Figure 4.1 – Energex's balanced commercial outcomes framework

It is important for Energex to understand the value proposition and individual drivers for each element of the balanced commercial outcomes framework. These elements are impacted by changes in the external environment and managing the interactions and dependencies between the three elements is fundamental to achieving our objective of delivering balanced commercial outcomes.

- Customers – delivering Energex's commitments, obligations and value proposition while optimising customer relationships.
- Risk management – delivering appropriate levels of network performance acknowledging technical standards, regulatory and legislative obligations, commercial considerations, customer expectations and commitments to staff.
- Financial sustainability – delivering shareholder returns and operating the business from a strong financial and commercial platform.

4.2 Customer and stakeholder views

Guided by its Customer Strategy, Energex has built a strong customer foundation of engagement and research (both ongoing and project-based) that assists in understanding customer expectations and views about our network investment including:

- Tracking research – Since 2007, Energex has been measuring customer sentiment which shows Energex is performing well across a range of performance measures such as corporate reputation, community regard, brand, service performance and electricity supply.

- Queensland Household Energy Survey (QHES) – Now in its fifth year, the QHES, a joint initiative of Energex, Ergon Energy and Powerlink, accumulates data on energy use, appliance penetration and saturation, and energy efficient behaviours in Queensland to assist with planning as well as in determining how best to manage energy use (particularly peak demand) now and into the future.

- Peak demand – Since 2008, Energex has been engaging with the appliance and electrical industries, businesses, communities and customers to develop programs that help address the challenges of peak demand.

- Customer working groups and councils – Senior Energex representatives participate in a number of industry and customer councils that facilitate information sharing and ideas exchange, including the Energy and Water Ombudsman Queensland (EWOQ) Advisory Council and the Energy Minister's Consumer & Industry Reference Group.

In 2012, work began to build on these current engagement processes and practices with the aim of increasing our understanding of customers' expectations of Energex, now and into the future. This increased understanding provides the opportunity to develop an improved customer engagement strategy and implementation framework to ensure their long term interests are represented in network investment strategies which balance customer expectations with maintenance of network security and financial sustainability.

An in-depth qualitative and quantitative research program involving a diverse range of connected customers (both residential and business), stakeholders and representative groups, is currently exploring the value drivers of different customer cohorts and their willingness to pay and trade for services across the various touch points, interactions and relationships they have with Energex. For additional detail, refer to section 5.2.

Customer concerns around electricity prices and expenditure are already being reflected through a reduced Program of Work (PoW). The ongoing customer engagement strategy will further consider how customer expectations should be incorporated into Energex's business and operational planning to better align customers' expectations and Energex's investment decisions and the direction of future expenditure priorities.

4.3 Corporate governance

Energex is a public, unlisted company, with two shareholding Ministers who hold the shares on behalf of the State of Queensland. The Board has reporting and continuous disclosure obligations to the shareholding Ministers under the *Government Owned Corporations Act 1993* (Qld) (GOC Act) and *Corporations Act 2001* (Cth).

Energex has a three-tier governance process to oversee future planning and expenditure on the distribution network. Central to Energex's governance process is compliance with legislation. The GOC Act requires the submission of a Corporate Plan (CP) and Statement of Corporate Intent (SCI) while *the Rules* require preparation of the DAPR.

The three tiers involve:

- High level targets and forecasts approved by the Energex Board as part of the five year CP and the annual SCI submitted to the shareholding Ministers for agreement.
- Endorsement by the Energex Board of the five year rolling expenditure programs and the 12-month detailed Program of Work (PoW) as part of the network investment plan.
- Annual budgets and delivery plans approved by the Energex Board.

The Board has established a number of committees to provide oversight of specific matters on its behalf. Each Committee is governed by a Charter and reports to the Board following Committee meetings.

The Network Technical Committee (NTC) assists the Board in discharging its responsibilities in relation to maintaining and improving technical and network standards for the delivery of electricity in a manner that meets the reasonable expectations of the community and complies with Energex's legal and regulatory obligations.

The overarching role of the NTC is to oversee Energex's approach to the distribution of safe, reliable electricity, consistent with the balanced commercial framework approved by the Board. The Committee provides oversight of cost efficient capital and operating investment that meets quality, reliability, safety and security of service targets.

4.4 Program and project governance

The development of programs and projects is undertaken in compliance with the relevant Energex policies and Business Management System (BMS). The BMS document control system provides management and access to policies, standards, procedures/work instructions, manuals and forms.

The Primavera system consolidates individual projects and associated estimates into the PoW. The program of work, and complex projects are managed in the Primavera project management system. Individual projects are then scheduled and delivered through the Ellipse program.

The Network Operations Committee (NOC) is responsible for monitoring and reviewing monthly performance reports detailing the current positioning of the PoW.

Table 4.1 outlines the financial delegation for Energex projects, which is undertaken in accordance with Energex's Delegation of Authority policy.

Table 4.1 – Financial delegation for capex projects

Financial delegation level	System projects	Non-system projects (excl. ICT)	ICT projects
Shareholding Ministers	> $75 million[1]	> $75 million	> $75 million
Energex Limited Board	up to $75 million	up to $75 million	up to $75 million
Chief Executive Officer	up to $15 million	up to $3 million	up to $5 million
Executive General Manager	up to $7.5 million	up to $1.5 million	up to $1.0 million
Chief Financial Officer	n/a	up to $300,000	up to $1.5 million
Group Manager	up to $1.5 million	up to $250,000	up to $500,000

1 In accordance with the Queensland Governments "Investment Guidelines for Government Owned Corporations", projects above $20 million are notified to shareholding Ministers, and projects above $75 million are submitted for approval.

Program variances and monitoring of program outcomes are overseen by senior management to ensure optimal performance outcomes.

Statistics regarding project variances are provided to the NTC. Specific reporting of projects requiring variance approval of greater than 10 per cent are reported to the NTC for projects between $7.5 million and $15 million, and reported to the Board for projects greater than $15 million.

4.5 Risk and optimisation

Energex's risk-based framework has been developed in accordance with AS/NZS ISO 31000:2009 Risk Management and maintains consistency with the Energex Enterprise Risk Management policy and procedure. The framework forms an input to the network investment and governance process.

The framework is used to assess risks and determine the tolerability of outcomes enabling application of a risk management approach to the network. A number of risk categories are utilised for assessing scenarios of concern. Each project or program is assessed for safety, environment, legislative compliance, customer impact, and business impact.

The asset management investment process considers the portfolio of projects and programs proposed for inclusion in future PoW on a consistent basis by:

- Reviewing programs and projects to assess the justification relative to drivers, risks, cost and performance targets.
- Reviewing the risks if the proposed programs and projects were not to proceed, and how the untreated risk could be otherwise managed to tolerable levels.

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

A profile is created for a portfolio of projects (eg reliability), or at a PoW level (eg corporate initiated augmentation). The profile generally takes the form of a program or portfolio of projects stacked by risk score (highest to lowest) versus cumulative program budget to enable program optimisation profiles to be developed. Projects or programs at the defined risk/budget boundary are analysed for inclusion or management of risk. Outputs of this process are an optimised portfolio of the various areas of work and across the capital and operating programs of work. Additional review cycles, if required, are included within the PoW delivery cycle.

4.6 Capital and operating trade offs

The efficient use of electrical infrastructure is key to Energex's prudent and efficient asset management practice and central to the assessment of options for expenditure. The benefits that flow from capital expenditure include additional modern assets with increased performance and low maintenance costs. These are assessed against operational expenditure.

Energex considers the trade-off between capital and operating expenditure in the following ways:

- Design and maintenance standards – The approach that Energex uses to develop its network is designed to minimise the whole-of-life cost of the assets. Enhanced network outcomes are also achieved by the implementation of new equipment designs resulting from advances in technology.

- Renew, replace or maintain assets – The decision to replace or maintain an asset is supported by the comprehensive Condition Based Risk Management (CBRM) methodology. This methodology uses a Net Present Value (NPV) analysis to determine the optimum time to replace an asset.

- Equipment specification and purchasing – A key specification for purchase of assets is a requirement to minimise whole-of-life costs. This assessment criterion is incorporated into Energex's procurement process for evaluating plant and equipment purchases.

- Investment in assets that will function in long term climate change scenarios.

- Demand management – In compliance with Clause 5.17.4 of *the Rules*, Energex's planning process includes application of the Regulatory Investment Test (RIT-D). This test is an important planning and consultative tool that ensures non-network solutions are also considered. In addition, Energex identifies where targeted area based schemes can defer projects identified in the five to ten year planning horizon.

4.7 Efficiency considerations

Energex is committed to improving operating efficiency consistent with shareholder and customer expectations. Energex continues to pursue efficiency gains through ongoing efficiency identification programs such as its recent Business Efficiency Program (BEP). Through the successful completion of BEP, which included business restructuring, Energex is targeting significant reductions in its expenditure to align with a lower capital program.

5 Assumptions and inputs

5.1 Demand, energy and customer numbers

Energex undertakes a comprehensive process to forecast demand, energy and customer numbers on a biannual basis.

The forecasting approach for energy and customer numbers was previously based on a combination of statistically based time series analysis and the application of extensive knowledge and industry experience. Given the recent changes in consumption trends, a more granular methodology has now been developed for forecasting which takes into account existing and future drivers and scenarios given the changing consumption and demand patterns of electricity customers. Weather, technology and customer behaviour drivers are now modelled separately giving greater insight into their impact on energy sales.

In addition, Energex has also developed an econometric electricity purchases model that is used at a total system level. This forecast is used to review and compare the bottom up energy sales forecast.

The system demand forecasts are based on the ACIL Tasman scenario modelling tool which uses multiple regression, in a Monte Carlo simulation process, to establish a relationship between demand drivers and seasonal peak demand. Substation peak demand forecasts are developed from historical load data which is then adjusted for temperature, underlying growth, load transfers and block loads for each year of the forecast period. Forecasts are adjusted for diversity and losses before aggregation to a system level value that is then reconciled with the independent system demand forecast.

Energex uses scenario modelling to simulate the impacts that drivers including government policy, the economic downturn, Solar PV and appliance energy efficiency improvements have on demand forecasts.

Independent consultant reviews and external forecast comparisons are used to substantiate the forecasts. All forecasts are independently reviewed to ensure they are reasonable having regard to market and economic conditions.

5.2 Customer engagement

Energex has initiated a broad program of customer and stakeholder engagement and research in preparation of the 2015-20 regulatory proposal. The outcomes of the engagement program will be used as an input into the submission to provide details on customer expectations regarding level of services, reliability and investment.

The detailed program of research, targeting over 6000 participants, is being conducted between May and December 2013, and from an expenditure forecast perspective, involves:

- Online quantitative research aimed at increasing understanding of customer expectations relating to services provided by Energex. The services being explored include the performance of network outages, work completed at individual properties, network maintenance and construction, demand management initiatives, advertising, sponsorship and preferred communication channels.

- A choice model testing customers' preferences and trade-offs relating to power outages. The choice model outputs are expected to provide insight into customer preferences regarding the interplay between outages (length, frequency etc) and associated costs with perceived changes in reliability.

- Quantitative and qualitative studies (focus groups, depth interviews and workshops) exploring customer expectations of Energex's responsibilities and role in new and future technologies including battery storage systems, electric vehicles, smart meters, smart grid, and solar PV.

5.3 Efficient base year

Energex has selected the financial year 2012-13 for use as the efficient base year as it contains the latest actual and audited expenditure information for the organisation. Energex considers that the 2012-13 opex outcomes are representative of recurrent costs with some exceptions. Adjustments will be made to account for unusual one-off base year expenditure items such as business restructuring and emergency response costs following ex-Tropical Cyclone Oswald.

5.4 Cost escalators

Forecast expenditure is based on the labour, materials and contractor costs at the time of preparation. Forecast expenditure over the regulatory control period is then escalated based on rates relevant to each of the above cost categories.

Energex engages a technical expert to provide advice and recommendations regarding appropriate escalation rates to ensure these are reasonable and reflect prudent and efficient operations.

5.5 Unit rates

Unit rates for labour, contractor and materials are based on:

- Labour – rates are built up for different categories of labour based on a fully costed labour rate (including on-costs such as long service leave, annual leave, payroll tax, workers compensation premiums and superannuation).

- Contractors – based on the current rates for the different categories assigned to contractors. The engagement of contractors and associated contract rates are established through formal tendering processes.

- Materials – based on the current average stores cost for the stock item. The selection of suppliers for provision of materials is through formal tendering processes.

Energex engages a technical expert to provide advice and review unit rates to ensure these are reasonable and reflect prudent and efficient operations.

5.6 Reliability and security

As described in Section 3, the network security and reliability standards are currently under review.

Energex aims to appropriately balance the benefit of network expenditure with outcomes that are acceptable to customers in terms of reliability and costs.

5.7 Overheads and On-costs

Network overhead costs include the following costs which are not directly attributable to activities or services:

- Network management – costs associated with managing and planning the network including development and administration of policies, standards, strategic planning & design and demand management.
- System operations and control – resource management and support costs associated with monitoring and controlling the operation of Energex's network.
- Network delivery – resource management and support costs associated with delivering operating and capital activities and services.

Corporate overhead costs include the following costs which are not directly attributable to activities or services:

- office of Chief Executive Officer
- human resources – resource management, recruitment and retention
- property and facilities management – property acquisition, disposal and maintenance
- performance monitoring and management – business performance and analysis
- information technology and communication – services provided by third party (SPARQ)
- training and OHS – specialist resource training and safety management
- business support services – including, accounts payable & receivable, records management, insurance and program delivery support.

Fleet and material on-costs are not directly attributable to services / activities but are applied proportionately to the service / activity based on internal labour and material costs respectively:

- fleet – costs associated with operating and maintaining Energex vehicles
- procurement and materials management – procurement strategy and administration, materials storage and distribution.

5.8 Other parameters

In addition to the main assumptions and inputs outlined above, there are a number of other parameters used in the development of expenditure forecasts.

Table 5.1 – General assumptions and input parameters for expenditure forecasts

Input	Details
Direct costs	The PoW for operating and capital expenditure is built up using direct labour, material and contractor costs.
Indirect costs	Indirect costs are those costs that are necessarily incurred to support the network but are not directly attributed to a specific activity or service.
Overhead costs	Indirect costs, where appropriate, are allocated (as overhead costs) to services based on direct spend in accordance with Energex's Cost Allocation Methodology (CAM), as approved by the AER.
Age and condition of assets	The age and condition of assets are key inputs in the development of asset replacement forecasts. The Condition Based Risk Management (CBRM) methodology used by Energex will be reviewed by an experienced consultant.
Asset quantities	The assumptions underlying asset quantities depend on the area of work: Planned works – quantities are based on the planned PoW. For large assets such as power transformers, quantities are based on the life of individual assets and the assets to be added as part of the annual capital program. For smaller and more numerous assets such as poles and pillars, quantities are based on a "number of units" or a percentage increase. These forecasts rely on historical trending and are adjusted for significant changes as a result of capital programs. Customer works – quantities are based on forecast customer numbers. Reactive/failure works – quantities are dependent on environmental conditions and rely on historical trending of failure rates.
Safety	Energex must comply with a range of safety obligations under national and jurisdictional legislative and regulatory instruments. Energex has incorporated expenditure to meet current obligations.

Input	Details
Workforce Capacity	Energex has assumed that resources will be available and capable to deliver the programs as forecast for the 2015 -20 regulatory control period.
Legislative and Regulatory	Energex has assumed that there will be no material amendments to the legislative and regulatory framework in the 2015-20 regulatory control period, over and above that anticipated and accounted for in the expenditure forecasts.

5.9 Estimation process

Energex uses a combination of comparative and standard cost estimating methodologies to underpin the estimation process for individual projects. Energex uses an estimating program that is part of the Ellipse Enterprise Resource Planning (ERP) package.

Energex standard designs for substations, overhead power lines and underground cables are the building blocks used for the construction of the network. Foundation or base individual components known as compatible units (eg circuit breakers, busbars, units of work) are combined to form standard assemblies/estimates (eg transformer bays), which in turn are built up into standard network building blocks (eg zone substations). This approach ensures all labour, material and contract work is included in compatible units and standard estimates. Where required, a project scope is developed by selecting the appropriate building blocks or compatible units to deliver the required network solution and the project estimate is developed from the standard estimates of the associated elements.

Project estimates are considered at key stages in the planning, design and construction process.

- Strategic estimates represent the initial determination of what the project may cost and are prepared based on minimal scoping for the purpose of program of works prioritisation and development.
- Preferred option estimates are produced with greater accuracy reflecting the more detailed scoping of the chosen network solution, used for prioritisation/inclusion in the program of work. This estimate is also used for RIT-D purposes.
- Approval estimates are developed from detailed planning analysis of individual network limitations used for formal approval of capital expenditure. Project approval estimates are used to forecast capital requirements typically in the zero to three year timeframe.
- A Total Out-Turn Cost (TOC) estimate is produced following the detailed design for an approved project.

6 Operating Expenditure

RULE REQUIREMENT

Clause 6.5.6 (a) Forecast Operating Expenditure

(a) 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

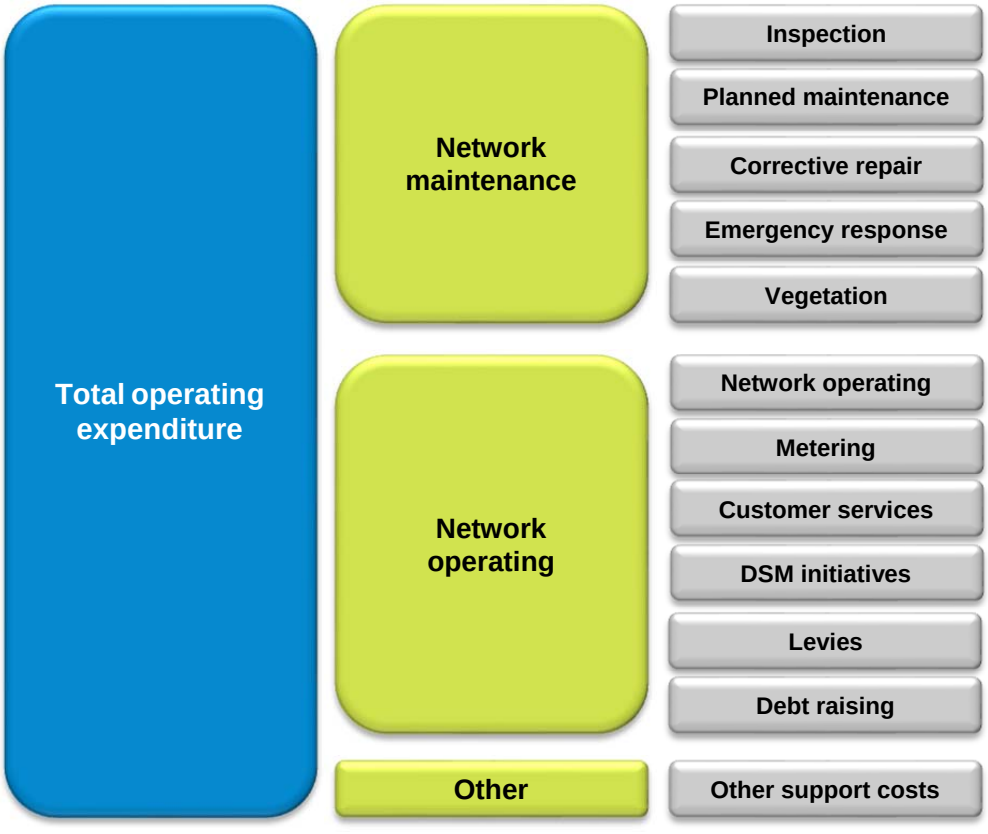
(iv) maintain the reliability and security of the distribution system through the supply of standard control services; and

(4) maintain the safety of the distribution system through the supply of standard control services.

6.1 Operating expenditure categories

The Energex operating expenditure categories are summarised in Figure 6.1.

Figure 6.1 – Operating expenditure categories



6.2 Operating expenditure forecast methodology

Clause 6.5.6(a) of *the Rules* requires that a building block proposal include the total forecast operating expenditure for the relevant regulatory control period which the DNSP considers is required in order to achieve each of the operating expenditure objectives. Energex develops an operating expenditure program for each regulatory control period to reflect the efficient costs that a prudent operator would require to achieve the opex objectives.

The AER has indicated a preference for the 'base-step-trend' approach to forecasting most operating expenditure categories. In accordance with the AER's preference, Energex has developed a base-step-trend methodology to forecast operating expenditure where appropriate. For cost categories, where base year costs are not considered to be representative of future, such as demand management initiatives, levies and debt raising an alternative method is used.

In addition, a zero-based forecast is developed for the planned maintenance and inspection categories. This forecast is based on a detailed program of work and is reconciled with the outputs of the base-step-trend method.

A summary of the methodology used for each expenditure category is shown in Table 6.1.

Table 6.1 – Forecast methodology by operating expenditure category

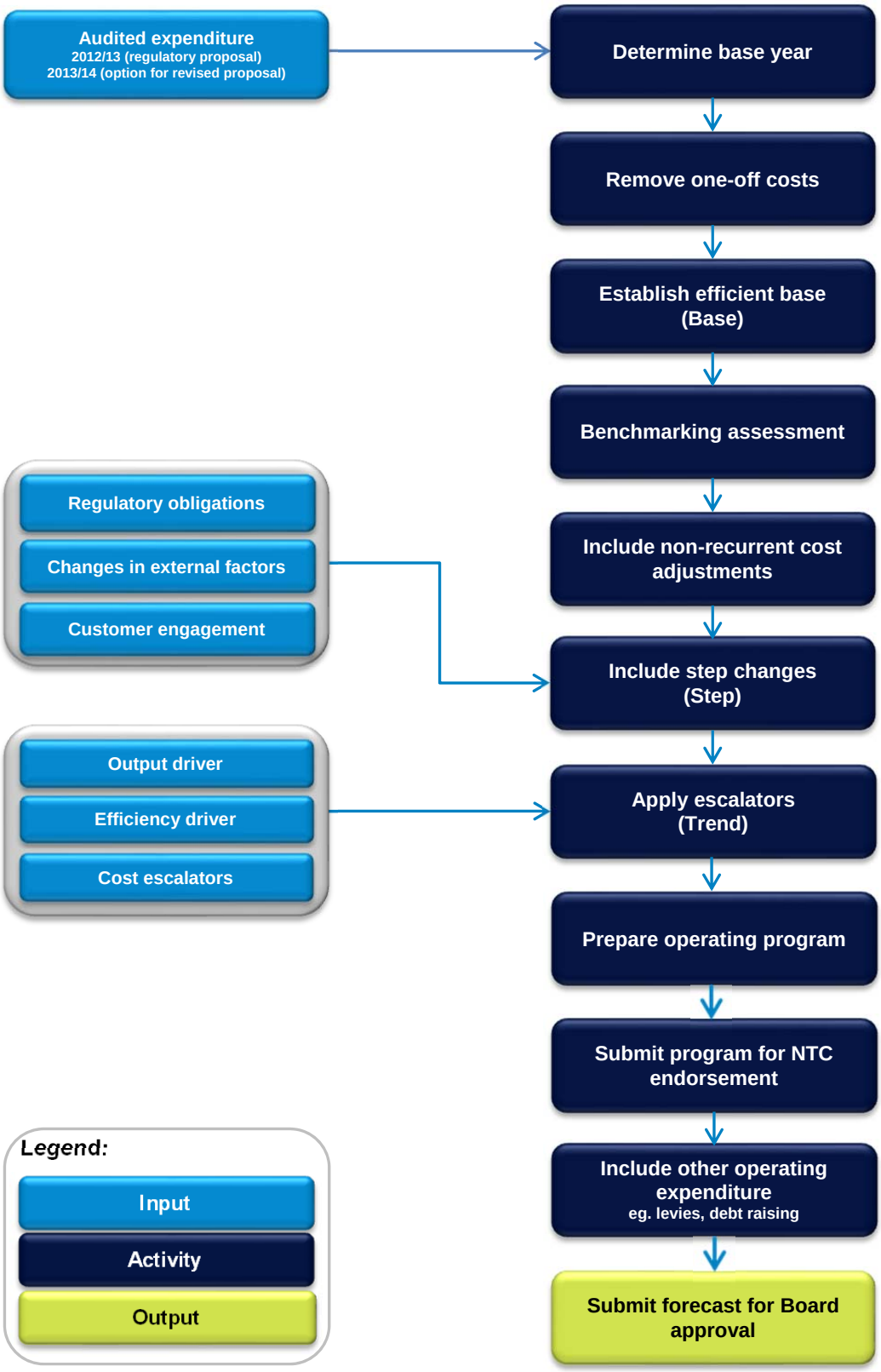
Cost category	Methodology basis
Network Maintenance	
Inspection	Base-step-trend method (reconciled with forecast quantities, unit costs and inspection cycles)
Planned Maintenance	Base-step-trend method (reconciled with forecast quantities, unit costs and maintenance cycles)
Corrective Repair	Base-step-trend method
Emergency response/storms	Base-step-trend method
Vegetation	Base-step-trend method
Network Operating	
Network Operating	Base-step-trend method
Metering	Base-step-trend method
Customer services	Base-step-trend method
DSM initiatives	Individual projects identified as part of the demand management strategy
Levies	Methodology published by the Department of Employment and Industrial Relations, Electrical Safety Office (ESO Levy) and methodology published by the Queensland Competition Authority (QCA Levy)
Debt Raising	Based on consultant advice regarding current and future debt raising costs

Cost category	Methodology basis
Other	
Other support costs	Base-step-trend or other method
Overheads	
Network and corporate overheads	Base-step-trend method

The methodology, shown diagrammatically in Figure 6.2, consists of the following steps:

- Determining the appropriated base year expenditure.
- Removing any one-off costs from the base year (eg costs associated with business restructuring and ex-Tropical Cyclone Oswald, or where a reclassification of services has occurred).
- Establishing the opex for an efficient base year for each cost category for which the base-step-trend method is applied.
- Benchmarking assessment at a program and category level to assess efficiency.
- Review of variances following the benchmarking assessment, where appropriate, including recognition for differences in size, scale and the geographic characteristics of other DNSPs.
- Include adjustments, where appropriate, to reflect non-recurrent costs (eg an allowance for storm response based on a long term historical average).
- Including step changes, where appropriate, to reflect changes in scope resulting from external factors outside of Energex's control (eg regulatory obligations, legislative impacts, outcomes from customer engagement which may impact on reliability expectations and response times).
- Applying trends (escalation) over the regulatory control period to account for:
  - output driver: network and customer growth
  - efficiency driver: technical efficiencies, economies of scale, workforce sizing
  - cost escalation: labour, materials and contractor costs.
- Preparing an operating program by combining forecasts developed for each cost category.
- Submission of the operating program to the NTC for endorsement.
- The inclusion of other operating costs which are calculated using alternative methods (eg levies, debt raising).
- Submission of the total operating expenditure forecast to the Energex Board for approval as part of the regulatory submission process.

Figure 6.2 – Operating expenditure forecast methodology



6.3 Operating expenditure description by category

6.3.1 Network maintenance

Inspection

Expenditure in this category includes Energex's inspection program to detect potential defects requiring remedial response as part of the planned maintenance program. Routine inspection periods for different assets are set out in the asset maintenance protocols.

A forecast of inspection costs for each category of plant and equipment is developed using forecast quantities based on unit costs and inspection cycles. This is used to confirm the credibility of the base-step-trend approach and provides a more detailed program of work.

Planned maintenance

Expenditure in this category includes the development and implementation of maintenance plans to provide a safe, reliable network that delivers power quality and legislative compliance whilst achieving an economical asset life.

Planned maintenance is a direct and forecast outcome of the inspection program or corrective repair works and is key to delivery of supply, reliability, security and safety objectives.

A forecast of planned maintenance costs for each category of plant and equipment is developed using forecast quantities based on unit costs and maintenance cycles. This is used to confirm the credibility of the base-step-trend approach and provides a more detailed program of work.

Corrective repair

Expenditure in this category includes 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 to allow future planned maintenance or replacement.

Emergency response/storms

Expenditure in this category includes the repair of damaged equipment and all storm-related repairs. Due to the unpredictable nature of the initiating events, a long-term historical average number of storm events will be used to make adjustments to the base year expenditure.

Material costs above this level (eg storm events on the scale of a natural disaster) are then managed through the pass through provisions within *the Rules*.

Vegetation

Expenditure in this category is required to support Energex's vegetation management program. This program attempts to balance the impacts of vegetation growth on reliability with community views about acceptable levels of tree clearance.

Vegetation in proximity to overhead powerlines presents significant risk to both safety and network reliability. Compliance with safety obligations requires Energex to ensure that clearance zones around powerlines are maintained to prevent contact with electrical equipment likely to result in injury to any person or damage to property. To manage this risk, Energex uses planned programs and reactive maintenance activities.

Energex's current vegetation management contracts are based on an Energex developed and managed program with a supplier submitted lump sum total cost per postcode.

6.3.2 Network operating

Network operating

Expenditure in this category includes activities required to manage the real time, safe and reliable operating of the network and includes activities such as:

- investigation and rectification of quality of supply issues
- power quality voltage investigations
- operating under contingent, severe load conditions
- transformer load checks
- management of switching
- rebalancing loads
- locating service cables (dial before you dig)

Metering

Expenditure is this category is required to support the metering requirements under standard control services, including meter reading, data storage, network billing and related costs.

- Metering operations – involves the role of official Responsible Person (RP) for Energex, the regulatory and compliance role for metering and a focus on metering Systems, new technology and equipment including systems integration and metering strategy.

- Energy market roles, including
    - the collection, validation, substitution, processing, reporting and delivery of meter data to AEMO and relevant market participants (Metering Data Agency (MDA) and Meter Data Provider (MDP))
    - support services such as Standing Data, Network Billing, Retailer Escalation (RED) and other support.

It is noted that current reviews may result in the reclassification of some services (metering operations and MDA/MDP roles) and this will cause subsequent changes to the forecast.

Customer services

Expenditure in this category includes costs arising from the provision of customer services, directly related to the planning, management and operation of the distribution network. Costs include Energex's network contact centre as well as customer initiated activities classified as standard control services.

Demand side management (DSM) initiatives

Expenditure in this category is required to support Energex's demand management strategy, which includes the following elements:

- Residential demand management programs that provide customers with incentives to take up direct load control options.
- Targeted initiatives that provide incentives to commercial and industrial customers to reduce peak demand in areas where significant network capital investment is expected within five to ten years.
- Shorter term demand management projects funded through the regulatory test (RIT-D) to address specific constraints in the network requiring investment within one to five years.

Forecast expenditure for DSM initiatives is based on an assessment and NPV analysis of individual projects identified in each of these areas.

Levies

Expenditure in this category covers the two levies applicable to Energex payable to the Electrical Safety Office (ESO) and the Queensland Competition Authority (QCA).

The ESO develops and implements legislative compliance and enforcement frameworks to improve electrical safety in Queensland. Energex forecasts expenditure for the ESO levy using the methodology published by the Department of Employment and Industrial Relations.

The QCA levy is payable under the *Queensland Competition Authority Amendment Regulation (No. 1) 2003.* Energex forecasts expenditure for the QCA levy using the QCA methodology and annual revenue reported in the regulatory proposal.

Debt raising

Expenditure in this category is a result of specific finance and transaction costs over and above the debt margin allowed in the cost of capital. Such costs are dependent on market conditions. Energex engages a technical expert to advise on the appropriate forecast for this expenditure.

6.3.3 Other opex costs

Other operating costs include corporate support costs such as:

- Governance, regulatory and compliance – including costs associated with corporate governance, regulatory affairs, internal audit, legal, corporate risk and compliance, strategy and planning and revenue strategy departments.
- Financial control and taxation – includes costs incurred in the management of financial control, taxation, external audit and regulatory reporting.
- Government relations and corporate communications – includes costs associated with the management of customer and government enquiries.
- Business transformation – includes costs associated with business efficiency improvement initiatives.
- Self-insurance – includes an indicative premium for below deductible values associated with public liability insurance, determined by actuarial consultant based on historical claim experience.
- Other minor ancillary expenses.

7 Capital expenditure

RULE REQUIREMENT

Clause 6.5.7 (a) Forecast Capital Expenditure

(a) A building block proposal must include the total forecast capital 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 capital 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

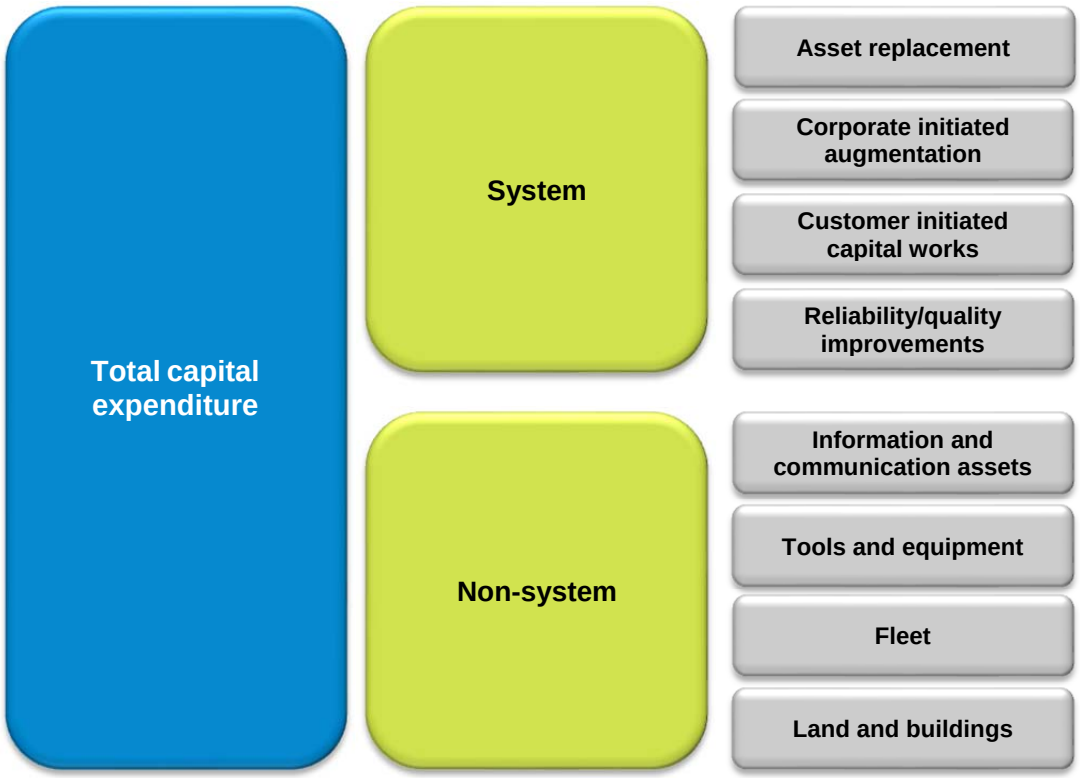
(iv) maintain the reliability and security of the distribution system through the supply of standard control services; and

(4) maintain the safety of the distribution system through the supply of standard control services.

7.1 Capital expenditure categories

The Energex capital expenditure categories are summarised in Figure 7.1.

Figure 7.1 – Capital expenditure categories



7.2 Capital expenditure forecast methodology

Clause 6.5.7(a) of the Rules requires that a building block proposal include the total forecast capital expenditure for the relevant regulatory control period which the DNSP considers is required in order to achieve the capital expenditure objectives. Energex develops a capital expenditure program for each regulatory control period to reflect the efficient costs that a prudent operator would require to achieve the capex objectives and in response to customer growth, demand and reliability expectations.

Energex's system capital expenditure program is developed through a network investment plan which is prepared in accordance with the network planning and governance processes outlined in section 4 to ensure prudency and efficiency of the capital spend.

The methodology includes developing a program on a project basis that meets the network requirements. Comparison to industry benchmarks at a program level provides a top down assessment of the program efficiency. To the extent the 'program based' and 'top down' assessments differ significantly, a more detailed analysis may need to be performed, which may ultimately require a level of judgment to be applied.

A summary of the methodology used for each expenditure category is shown in Table 7.1. More detail on the methodology for each category is included in Section 7.3.

Table 7.1 – Forecast methodology by capital expenditure category

Cost category	Methodology basis
System	
Asset replacement	Forecast quantities and unit costs based on CBRM analysis for transmission assets Age profiles, historical failure and replacement rates for distribution assets
Corporate Initiated augmentation	Forecast quantities and unit costs for both infrastructure and land based on future demand growth
Customer initiated capital works	Forecast quantities and unit costs based on customer number forecasts, regional development plans and known development applications
Reliability/quality improvements	Forecast quantities and unit costs based on expected gap to MSS requirements, and quality performance requirements
Other	Forecast quantities and unit costs based on known safety and legislative compliance requirements
Non-system	
Information and communication assets	Forecast quantities and unit costs in accordance with ICT policy, plan and renewal guidelines
Land and Buildings	Forecast quantities and unit costs in accordance with Corporate Property Strategy
Fleet	Forecast quantities and unit costs based on condition of current fleet, useful life and future Program of Work (PoW) resource requirements

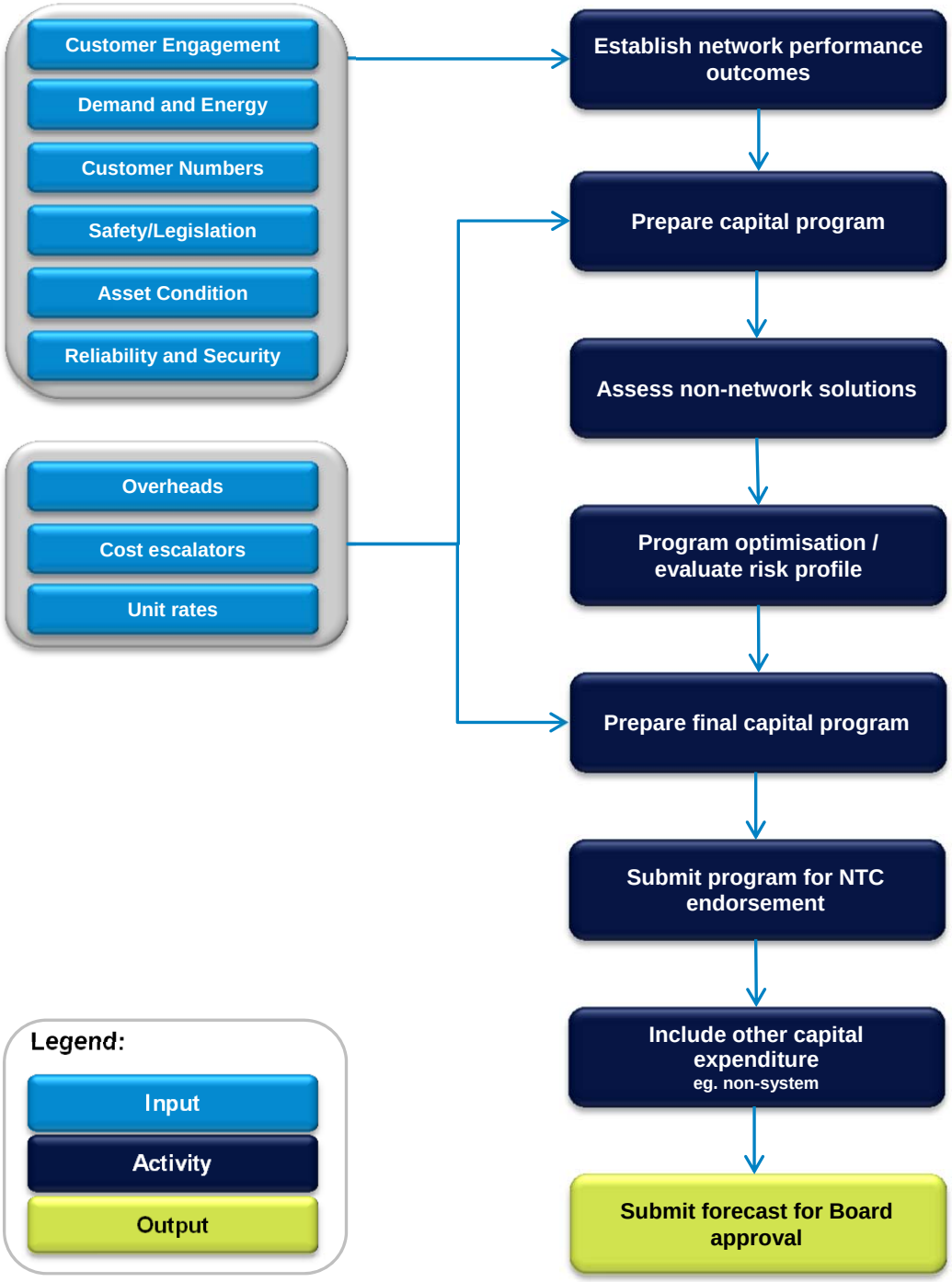
Cost category	Methodology basis
Tools and Equipment	Forecast quantities and unit costs based on condition of current equipment, useful life and future PoW resource requirements
Overheads	
Network and corporate overheads	Base-step-trend method

The key components of the forecast capital expenditure process, summarised in Figure 7.2 include:

- Preparation and consideration of the key inputs:
  - feedback from customer and stakeholder engagement
  - demand, energy and customer number forecasts
  - safety/legislation obligations
  - asset condition
  - reliability and security standards.
- 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.
- Preparing a capital program that addresses the drivers of asset replacement, growth, reliability, power quality and safety.
- Consideration of capital and operating expenditure trade-offs, including the assessment of non-network solutions.
- Optimisation of the capital program to achieve target network performance outcomes including an evaluation of the risk profile, as discussed in section 4.5.
- As part of the final program, network risk is revisited, the material and resourcing requirements are identified and financials are finalised.

The forecast capital expenditure is submitted to the NTC for endorsement and ultimately to the Energex Board for approval as part of the regulatory submission process.

Figure 7.2 – Capital expenditure forecast methodology



7.3 Capital expenditure description by category

7.3.1 System capex

Asset replacement

Expenditure in this category is for the primary purpose of maintaining the existing level of supply and standard of service by replacement or renewal of assets. This can be for assets that are no longer capable of delivering their designed purpose or where the NPV of maintaining the asset exceeds the replacement cost. This category also includes the replacement of secondary assets such as protection relays and supervisory control and data acquisition (SCADA) equipment.

Energex applies a Condition Based Risk Management (CBRM) methodology to forecast the replacement of high value transmission assets (eg large power transformers). The CBRM process is based on asset condition and performance and quantifies the risk of failure by using this information and engineering knowledge of the assets. The key aspect of this approach is that age is not the sole determinant of replacement of assets; rather a combination of factors which describe their condition will determine when they are replaced.

The replacement forecasts of distribution assets (which are not assessed through the CBRM methodology) are based on historical failure and replacement rates. This includes high volume, low value assets such as pole mounted transformers. Energex's wood pole replacement forecasts are based on age profiles and average replacement age. The wood pole program also includes the nailing of poles where necessary to extend the expected life.

Detailed programs are produced for all asset classes. Where practical, in terms of timing, asset replacement work is incorporated in other capital projects to achieve a cost efficient outcome.

Corporate initiated augmentation

Expenditure in this category is required to meet the increase in demand or additional load within the network, including the purchase of operational land and easements.

Energex's security standard has been a driver of augmentation expenditure in the 2010-15 regulatory control period. This standard was reduced following the ENCAP review and is currently under further review by the Queensland Government. Changes to the standard will be reflected in future forecasts.

Energex uses a project based approach to developing its future corporate initiated augmentation expenditure. The key components of the process include:

- Development of load forecasts for Energex's bulk supply and zone substations and sub-transmission and distribution feeders.
- Assessment of network performance against current planning, reliability and security criteria.

- Options analysis including a technical review of network and non-network solutions.
- The application of a risk assessment to each project to quantify the risk to electricity distribution and supply to customers if the network upgrade does not proceed within the nominated time period.

From 1 January 2014, all capital projects with an augmentation component greater than $5 million will be subject to the RIT-D test.

Customer initiated capital works

Expenditure in this category is required to provide connection to the network for new customers with connection less than 1MVA. Energex connects new customers each year to new underground subdivisions in urban areas and by extending the overhead network in rural and semi-rural areas.

Where the design and construction of connection assets is an alternative control service (typically customers with a connection greater than 1MVA), this is excluded from the forecast. It is noted that if additional connection services are reclassified as alternative control services, this will cause subsequent changes to the forecasting methodology

Expenditure forecasts are based on customer number forecasts, regional development plans and known development applications.

Reliability/quality improvement

Expenditure in this category is required to address network reliability requirements and improve power quality.

The reliability programs included in the expenditure forecast are developed in accordance with Energex's Reliability Strategy with the purpose of delivering reliability performance in line with customer expectations and to comply with the MSS. In developing the expenditure forecast, Energex is cognisant of the need to ensure improvements are targeted and address poor performing parts of the network, including worst performing feeders, on a priority basis.

Energex's MSS targets are currently under review by the Queensland Government. Changes to the targets will be reflected in future expenditure forecasts.

The power quality programs included in the expenditure forecast are developed in line with the performance requirements outlined in Section 5.1 of *the Rules*. Expenditure includes both monitoring and remediation works.

7.3.2 Non-system capex

Information and communication assets

Information and Communication Technology (ICT) assets underpin Energex's ability to provide standard control services efficiently through effective asset information management services. Expenditure in the non-system ICT capex category includes personal computing equipment, mobile communications hardware and field support devices used in supporting the delivery of standard control services. Forecast capex expenditure for ICT is based on an assessment of the equipment through its useful life and identifying optimal replacement solutions.

SPARQ Solutions Pty Ltd (SPARQ) provides major systems, software and infrastructure services to Energex as a related party. The associated ICT equipment and infrastructure costs, including software applications and data management are charged to Energex as Asset Usage Fees and ICT support fees and are incorporated into corporate overheads. Forecast expenditure incurred by SPARQ is determined based on a forecasting method that uses the concepts of recurrent spend (derived from a base-step-trend approach) and non-recurrent spend (based on an assessment of individual initiatives).

Land and buildings

Expenditure in this category relates to corporate property and buildings and is based on the Corporate Property Strategy. The objective is to align property, accommodation and facility requirements with the operational need to facilitate the efficient delivery of network services. The expenditure is supported by individual business cases including a cost benefit analysis.

Fleet

Expenditure in this category is based on the fleet capital program, a strategic plan that describes the right and timely investment in the Energex fleet. The capital program includes both a short term and a long term view of the mix and size of the fleet necessary to support the operation of the regulated network business.

The capital plan is reviewed annually to determine the optimum strategy of what the future Energex fleet should comprise to meet corporate and end user business requirements. The plan is developed within budget guidelines, technological developments, performance data and divisional business plans.

The forecast expenditure for fleet is based on the condition of current fleet and an estimate of the useful life, consistent with the forecast resourcing requirements.

Tools and equipment

Expenditure on tools and equipment is derived from equipment testing and inspection management systems and includes the acquisition and replacement of hand-held tools and safety equipment.

8 Acronyms and abbreviations

Table 8.1 – Acronyms and abbreviations

Abbreviation	Description
AER	Australian Energy Regulator
BEP	Business Efficiency Program
BMS	Business Management System
CAM	Cost Allocation Methodology
Capex	Capital Expenditure
CBRM	Condition Based Risk Management
CP	Corporate Plan
DAPR	Distribution Annual Planning Report
DEWS	Department of Energy and Water Supply
DSM	Demand Side Management
DNSP	Distribution Network Service Provider
EIC	Electricity Industry Code
ENCAP	Electricity Network Capital Program
ERP	Enterprise Resource Planning
ESO	Electrical Safety Office
EWOQ	Energy and Water Ombudsman Queensland
GOC	Government Owned Corporation
ICT	Information and Communication Technology
MSS	Minimum Service Standards
NER	National Electricity Rules (or *the Rules*)
NOC	Network Operations Committee
NPV	Net Present Value
NTC	Network Technical Committee

Abbreviation	Description
Opex	Operational Expenditure
PoW	Program of Work
PV	Photovoltaic (Solar PV)
QCA	Queensland Competition Authority
RIN	Regulatory Information Notice
RIT-D	Regulatory Investment Test - Distribution
the Rules	National Electricity Rules (or *the Rules*)
SCADA	Supervisory Control and Data Acquisition
SCI	Statement of Corporate Intent
TOC	Total Out-turn Cost