Jemena Electricity Networks (Vic) Ltd

Expenditure forecasting methodology

2021-25 regulatory control period

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TABLE OF CONTENTS

List of tables

List of figures

GLOSSARY

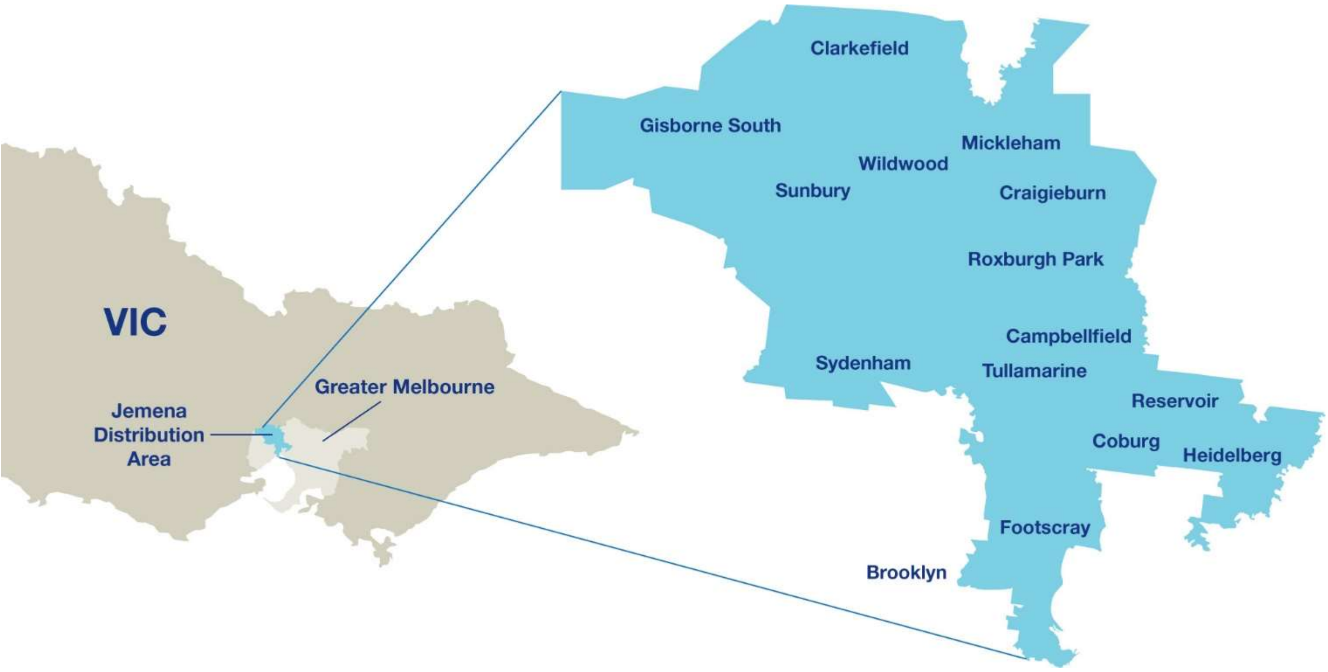
AER	Australian Energy Regulator
AMI	Advanced Metering Infrastructure
capex	Capital expenditure
CBRM	Condition Based Risk Model
ESC	Essential Services Commission
EUE	Expected Unserved Energy
forecast regulatory period	1 January 2021 – 31 December 2025
GSL	Guaranteed Service Level
IT	Information Technology
JEN	Jemena Electricity Networks (Vic) Ltd
NEL	National Electricity Law
NER	National Electricity Rules
opex	Operating expenditure
RAB	Regulatory Asset Base
RIN	Regulatory Information Notice
SCADA	Supervisory Control and Data Acquisition
VCR	Value of Customer Reliability

1. INTRODUCTION

Jemena Electricity Networks (Vic) Ltd (**JEN**) is one of five electricity distribution networks in Victoria. We are the sole distributer of electricity in north-west greater Melbourne, and we service more than 330,000 households and businesses.

Our role is to deliver power when our customers need it. We build and manage the infrastructure that transports electricity through more than 950 square kilometres of Melbourne's north-west suburbs, with Melbourne Airport sitting almost at the middle of our patch.

Anyone who is currently connected to the electricity distribution network in our area is a customer of ours. We also connect new customers and provide distribution services to other groups like property developers, landlords and businesses of all sizes, from sole traders all the way through to large energy consumers such as Melbourne and Essendon Airports and the Austin and Western General Hospitals.



1.1 BACKGROUND

On 31 July 2019, we will submit a regulatory proposal to the Australian Energy Regulator (**AER**). The AER will assess our proposal as part of the process to set our services and prices for the regulatory control period from 1 January 2021 to 31 December 2025 (**forecast regulatory period**).

In setting our service and prices for the forecast regulatory period, the AER will ensure that we have a reasonable opportunity to recover our efficient costs. As a result, our forecast expenditure for the forecast regulatory period plays a key role in the price-setting process, which is governed by the National Electricity Law (**NEL**) and the National Electricity Rules (**NER**).

1.2 PURPOSE

Clause 6.8.1A(a) of the NER requires us to inform the AER of the methodology we propose to use to forecast operating and capital expenditure in our regulatory proposal for the forecast regulatory period. This document sets out our forecasting methods.

1.3 FORECASTING METHODS OVERVIEW

This document explains the processes and major inputs we will use to develop our capital and operating expenditure forecasts when providing distribution services in the forecast regulatory period. At a high level, this involves three key tasks:

1. understanding and estimating key expenditure drivers, explained in chapter 2,
2. developing a capital expenditure forecast, explained in chapter 3, and
3. developing an operating expenditure forecast, explained in chapter 4.

1.3.1 EXPENDITURE DRIVERS

The first task is understanding and estimating our key expenditure drivers over the forecast regulatory period, including:

1. our customers' expectations, preferences and requirements for the forecast period
2. how our customers' expectations, preferences and requirements may change over the long term
3. technical, safety, environmental and other obligations we will need to comply with
4. maximum and spatial demand that our network will need to meet
5. number of customers that we will serve
6. amount of electricity that our customers will consume
7. level of reliability and quality of supply on our network
8. condition of our assets
9. efficiency improvement opportunities available to us
10. market benefit opportunities that we can facilitate
11. changes in our input costs
12. trade-offs that we can make between operating and capital expenditure.

1.3.2 CAPITAL EXPENDITURE

The second task is to develop a bottom-up forecast (also referred to as a zero-based forecast) of our capital expenditure for the forecast regulatory period. Different methods are used for different types of capital expenditure.

For example, for regularly-recurring expenditure, such as asset replacement, we use estimation models to predict the likely required volume of replacement for certain assets. For some assets, these models may use asset condition or other data to estimate when assets will require replacement. We can then estimate the replacement unit cost and multiply this cost by the forecast volume to derive an expenditure forecast.

For less regular expenditure, such as network upgrades (augmentation), we develop a forward view of the major projects required over the forecast regulatory period and estimate the costs of these projects on an individual basis.

1.3.3 OPERATING EXPENDITURE

Our method for forecasting operating expenditure is different to the method used for capital expenditure. At a high level, we will use the AER's preferred 'base, step and trend' approach. This approach involves using actual operating expenditure data for the latest full year (called the 'base year') as a starting point for the forecast—in our current process, we will propose this to be the 2019 calendar year.

We will then adjust our base year's actual data to account for one-off events and trend these costs to account for forecast network growth, real input cost changes and productivity gains or losses. For the forecast regulatory period, we propose to make changes to the treatment of overhead costs, which will include the expensing of corporate overheads from 1 January 2021. We will also identify any major expected step changes to our opex forecast due to factors not captured in our base year—for example, increases in our forecast operating expenditure as a result of a trade-off with forecast capital expenditure—and develop individual estimates for step changes as part of our operating expenditure forecast.

1.4 PROVIDING FEEDBACK

We are currently undertaking a wide range of customer engagement initiatives. If you would like to provide feedback on this document or have your say on your future electricity prices, services and network, please visit https://yourgrid.jemena.com.au/.

2. EXPENDITURE DRIVERS

We will use the methods outlined in this document to forecast expenditure for the forecast regulatory period. However, we must first understand the drivers which will underpin the need for our expenditure. At a high level, we need to spend money to connect new customers to our network, meet expected demand, and to maintain the quality, reliability, security and safety of our services. Our key expenditure drivers are explained below.

Engaging with our customers

Responding to our consultation with stakeholders, including our customers, can drive our expenditure. As part of our commitment to ensuring our future plans meet our customers' needs and expectations, we want to better understand their requirements and ensure that we provide services which are in their long-term interests. The way we provide distribution services may evolve as we better understand our customers' requirements, including facilitation of the growing deployment of Distributed Energy Resources across our network, this may also affect our expenditure.

Genuine conversations and changing expectations: Jemena's People's Panel

As a key part of our customer engagement, we convened a People's Panel of 43 customers who met six times over a total of 20 hours during July and August 2018. Through a deliberative process, the Panel created a set of recommendations which described customers' future preferences for electricity distribution services, reliability and cost. During the process, the Panel was presented with a range of information, including by a number of external speakers, to inform their recommendations. The Panel ultimately presented its 25 recommendations to Jemena's Chairman and Managing Director, with these recommendations a key example of customer input to our expenditure forecasts.

Meeting expected demand

A large amount of our expenditure is driven by the future energy needs of our customers. We must plan, design and build our network assets to ensure that the needs of our customers can be met today and in the future. The amount of energy our customers use, the time that they use it, whether they generate it themselves and share it and the location where they use it all significantly shape the nature of our network. We may need to make changes to our network to accommodate these requirements. Customer demand itself is underpinned by a number of factors including economic and population growth, urban development and consumer and industry trends.

We also connect new customers to our network, and must adhere to regulations around how we offer, negotiate, plan and manage these connections.

Maintaining service reliability and quality

The Essential Services Commission (**ESC**) sets standards for supply quality[1], supply reliability and customer service[2] which we must meet. Maintaining the reliability and quality of our electricity supply becomes more challenging as our network assets age, so, from time to time, we need to spend money to repair, refurbish or replace assets.

Additionally, the economic regulation of our services includes a mechanism (the service target performance incentive scheme) that rewards us for improving the supply reliability of our services, and penalises us if our service reliability deteriorates.

Meeting safety, environmental and other regulatory obligations

Various statues, rules and codes set out other obligations which we must meet. The services we provide and the operations we carry out are heavily regulated with regards to safety and environmental obligations, as well as service standards and the prices we charge. Our principal regulatory bodies are the AER, ESC, Energy Safe Victoria and the Environment Protection Agency.

We must spend money to ensure we meet a range of safety and environmental regulations. We must adhere to safety and security standards when we design and undertake work on our assets. We must ensure that vegetation growing near our assets does not pose a safety hazard. We must also comply with various environmental obligations related to vegetation, contaminants and noise. We also incur costs in meeting our obligations to the AER, including requirements for reporting, preparing a regulatory proposal and network planning reporting (such as distribution annual planning reports and for the regulatory investment test for distribution).

Achieving optimal efficiencies

We seek to identify ways in which we can more efficiently provide our services, ensure we provide services that our customers value the most and ensure the services we provide evolve to be the most efficient mix over the long term. As technology develops over time, new and efficient ways of designing, operating and monitoring our network, interacting with our customers and providing our corporate support services will become available, with the potential to benefit us and our customers.

Some external factors outside our control can also make it more costly for us to maintain the reliability and quality of our services. Advances in distributed energy resources have given customers the ability to generate their own electricity and feed it into our network. In some cases, this can pose challenges for us when designing and managing assets which have historically only transported electricity one way to our customers—not bi-directionally as is the case with distributed energy resources.

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1 Through the Electricity Distribution Code, section 4.

2 Through guaranteed service levels, as set out in section 6 of the Electricity Distribution Code.

Planning for the future of the grid

As our customers' energy needs rapidly evolve, we need to explore new opportunities to ensure we are most efficiently meeting their needs. Increasingly, the emergence of new expenditure drivers—such as ensuring our network has sufficient ability to host exports of from small-scale distributed energy resources while still meeting power quality requirements—will require us to implement new technological solutions to address these new issues. For example, our People's Panel highlighted strong customer expectations that we should enable the increased feed-in of solar and other small-scale renewable generation into the grid.

We therefore actively explore trade-offs between different types of investments (both between different types of capital expenditure and between capital and operating expenditure) to ensure our capital and operating expenditure forecasts reflect an optimal allocation of resources to meet customers' future needs.

3. CAPITAL EXPENDITURE

3.1 OVERVIEW OF APPROACH

We propose to apply a ‘bottom-up’ approach to forecast our capital expenditure (**capex**) for the forecast regulatory period. The starting point of our bottom-up cost build is developing project and program plans for our network and non-network assets. Examples of these include:

- asset replacement projects
- network upgrade and modification projects
- customer initiated projects
- information technology and other non-network capital program plans.

We prepare these project and program plans in the usual course of business planning, detailing the investment required for us to continue to provide distribution services into the future. These project and program plans draw on information provided by our customers about their expectations and requirements, as well as information maintained in our internal asset management databases relating to our assets. The information we use when developing project and program plans includes:

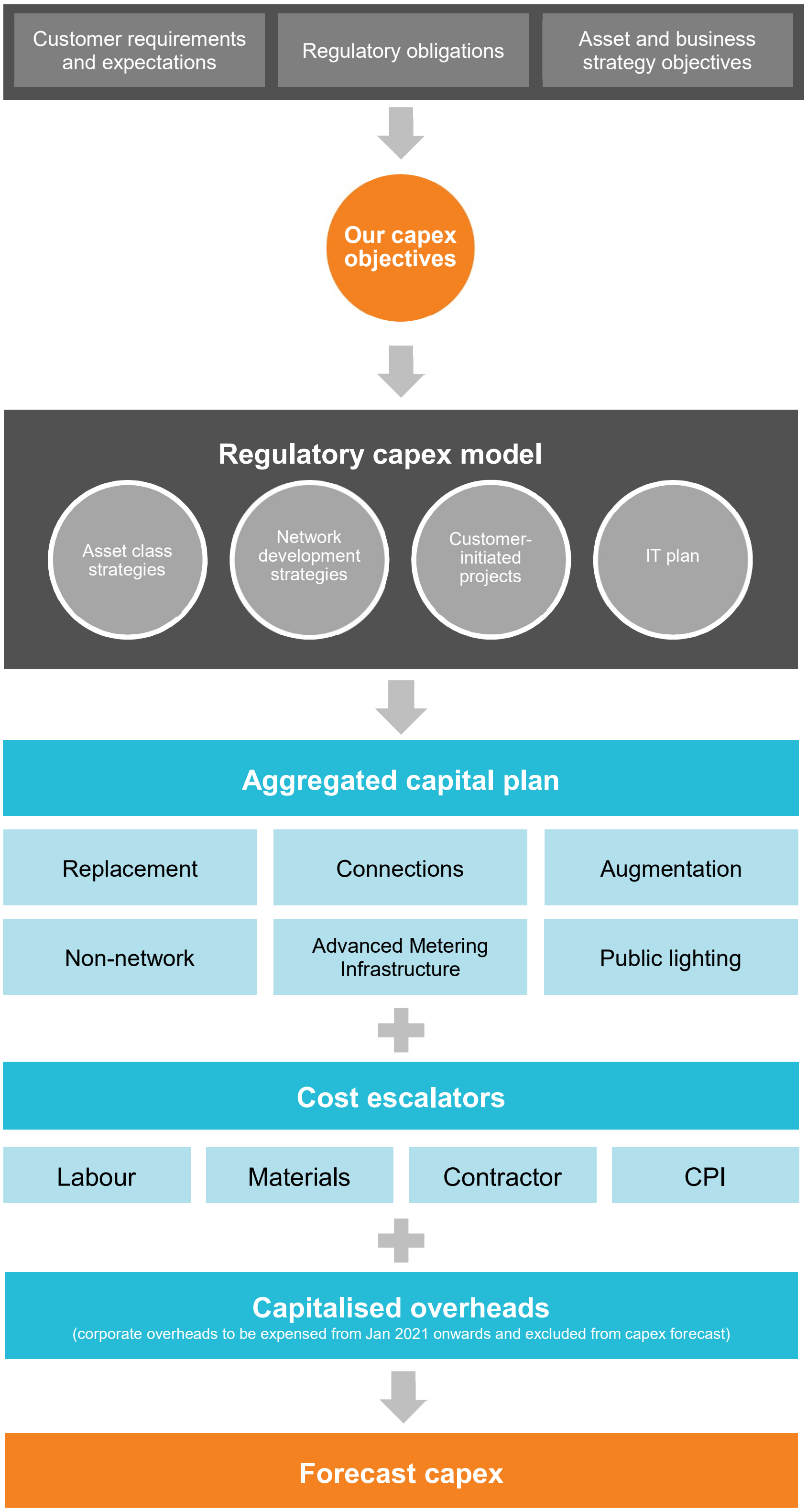
- forecast demand for our services
- asset quantities, location, type and age
- asset condition (test and audit data)
- asset ratings and utilisation rates
- network outage data and other performance data
- detailed project, contractor and work activity cost estimates.

The individual project and program plans each apply their own fit-for-purpose forecasting methodology used in our usual course of business, but are continually updated and improved to reflect changing market factors and investment drivers. Further detail on our individual forecasting methodologies is provided in section 3.2.

The project and program plans are then fed into our regulatory capex model, where they are combined into a single capital plan for the forecast regulatory period. At this stage, the required projects are itemised and prioritised and expenditure is mapped to the required regulatory cost categories. We also apply inflation and cost escalators to account for changes in our labour, materials and contractor costs. Finally, we apply network overhead costs to derive our total forecast capex.

This process is summarised by Figure 3—1.

Figure 3—1: Our capital expenditure forecasting method – prudently and efficiently meeting customers' needs



3.1.1 QUALITY ASSURANCE OF GOVERNANCE FRAMEWORK

Jemena has recently completed audits for and been recommended for certification to ISO 55001[3] (asset management) and ISO 27001 (information security) standards. This reflects international best practice in asset management governance, processes, policies, strategies and plans and demonstrates prudent and efficient decision making. This accreditation is an upgrade to our previous certification of our asset management framework to PAS 55[4].

Our quality assurance and governance frameworks mean that all projects and programs—even in the medium to longer-term forecasts—require extensive analysis, documentation and peer review before they are included in our capital plan. We are therefore confident that our project and program plans and expenditure forecasts are likely to accurately reflect the actual costs needed to manage our assets in accordance with industry best practice.

3.2 BOTTOM-UP FORECASTING APPROACHES

This section explains the nature of the expenditure and the underlying forecasting methodology for the each of the following categories:

- replacement capex
- connections capex
- augmentation capex
- non-network—information technology (**IT**) capex
- non-network—other capex
- advanced metering infrastructure (**AMI**) capex
- public lighting capex.

Figure 3—2 presents a classification of forecast capex by regulatory cost categories.

Figure 3—2: Capital expenditure categories

Network capex	Replacement
	Connections
	Augmentation
	Advanced Metering Infrastructure
	Public lighting
Non-network capex	Information technology
	Other (Fleet, Property, etc.)

[3] ISO 55001 Asset management – Management systems – Requirements, published by the International Organization for Standardization

[4] Publicly Available Specification 55, published by the British Standards Institution

3.2.1 REPLACEMENT CAPEX

Replacement capex is required to maintain the level of performance provided by our existing assets. The drivers for replacement capex include deterioration in the condition of an asset or its environment and where increases in maintenance costs mean it is more cost effective to replace an ageing asset than continue to maintain it. We also undertake consequence based replacement, where we undertake a thorough assessment of ‘needs’ to determine whether a lower rated asset could satisfy a requirement rather than blanketly apply a like-for-like replacement. Consistent with the AER’s category analysis definitions, capital expenditure for SCADA and network control is also forecast using the methods outlined in this section.

We manage and plan asset replacement by grouping our assets into a set of classes, for which we develop project and program-level forecasts. These asset classes can be further grouped into the following categories:

- low volume/high cost assets—where we know or can estimate information on the condition or performance of a specific asset, we can predict the need to replace it and then identify appropriate solutions; and
- high volume/low cost assets—where it would be cost prohibitive to identify and analyse individual future asset requirements, we use simplified approaches to produce aggregate forecasts for an asset population.

For a number of critical assets, we develop a condition-based risk model (**CBRM**) to support the evaluation described above. CBRM is a risk based model that generates an asset health index and ageing rate. This is used to estimate a probability of failure and a range of future failure rates depending on the intervention measures we may choose to take.

Condition and consequence based asset replacement

When developing our asset replacement forecast, we take into account not only the condition of our assets, but also the consequences in the case that they were to fail. This ensures that our replacement expenditure is only the amount necessary to continue supplying customers based on their current and likely future requirements.

For example, the failure of a transformer supplying a local area where there is spare network capacity (such as an industrial area where some large energy users have recently closed) may have a relatively minor impact on supply to customers. Our replacement approach for such a transformer may therefore be to allow the transformer to fail, or replace it with a lower capacity unit, rather than simply undertaking like-for-like replacement on the same basis as an asset whose consequences of failure would be much greater.

3.2.1.1 Forecasting approach

For low volume/high cost assets, we prepare forecasts based on our business-as-usual planning processes. Information about specific assets (such as asset test or audit data, asset performance data or condition based data) is used to assess the need to replace individual assets. If we identify a need, we develop and evaluate replacement options. We then develop a cost estimate for each option given the scope of works and relevant unit cost schedules for those options.

For high volume/low cost assets, the techniques we use to develop program-level forecasts can be broadly classified as one of the two approaches summarised below:

Recurrent programs

We prepare forecasts for recurrent programs (for example, the condition-based replacement of poles) using different methods depending on the circumstances. Two such methods include:

- using predictive models, for example CBRM or methods similar in philosophy to the AER's repex model, to estimate a future trend in the volume (or expenditure) of ongoing programs based on asset information such as age and distribution of failure
- using historical trends (either of volume or expenditure) for some smaller programs, where it is not considered appropriate to develop more complex forecasting models (given the benefits and costs of obtaining a more accurate forecast). For some assets, we only replace when failure has occurred.

Special-purpose programs

We use these programs to address a specific need, such as when an asset (or class of assets) begins to exhibit a safety or performance issue. A forecasting approach similar to that of low volume/high cost assets is employed.

3.2.2 CONNECTIONS CAPEX

Customer connections capex is required to plan and construct new customer connections and upgrade existing customer connections. We undertake this work upon the request of customers and real estate and property developers.

The nature of connections activities and expenditure is unique compared to most other expenditure categories, and this uniqueness poses challenges for preparing short, medium and longer-term forecasts, as:

- connections are a reactive activity which are only undertaken in response to customer requests
- the volume of work is largely driven by external factors (for example, economic activity)
- there is a wide variation in customers' requirements, and therefore connection project types and costs.

For the majority of our connections expenditure, we use an economic modelling approach to produce a forecast of total connection volumes and expenditure. This approach links movements in certain economic indicators, forecast by expert consultants, to connection activity levels.

3.2.2.1 Forecasting approach

The forecasting model used for connection expenditure can be separated into two elements:

1. Annual expenditure forecasting—we use this approach to construct a relationship between our historical annual expenditure and economic explanatory variables. These relationships are used to develop 7-year, annual expenditure forecasts.
2. Annual activity volume forecasting—we use this approach to produce annual activity volume forecasts. We do this by applying historical volumes to an annual expenditure forecast, and then seasonalising the forecast.

We use each of these elements as inputs to our connections model to derive our forecast connections. Additionally, we will produce bottom-up forecasts for a small number of very large customer connection projects, based on specific information from these customers about their individual requirements.

3.2.3 AUGMENTATION CAPEX

Augmentation expenditure is required to ensure our network can meet customer requirements for electricity demand, reliability and quality. Typically, this category of expenditure is driven by changes in our customers' maximum demand for electricity, however other augmentation expenditure drivers are becoming increasingly prevalent, for example providing sufficient hosting capacity to accommodate an increase in energy exports from small-scale distributed energy resources.

We employ a proactive planning approach for our sub-transmission lines, zone substations and high voltage feeders. We use customer number and demand forecasts, historical trend data and direct consultation with large customers to understand whether customers will require extra network capacity in the future—as we must augment network capacity in anticipation of any increased demand occurring.

For distribution substations and low voltage circuit augmentation, we consider both proactive and reactive approaches. We employ analysis and load testing of the network to proactively identify areas that require augmentation in order to mitigate imminent reliability and power quality issues. Reactive augmentation of the network is also undertaken to resolve network issues typically identified during periods of peak demand.

3.2.3.1 Forecasting approach

Our forecasting approach to augmentation expenditure involves several stages of technical and economic analysis. This analysis predicts and evaluates emerging constraints on transfer of electricity in our network. Although augmentation capex has historically generally been driven by forecasts of maximum demand, factors other than maximum demand are increasingly driving augmentation expenditure.

The key inputs and assumptions in our augmentation expenditure forecasts include (but are not limited to):

- spatial peak demand forecasts
- customer demand assumptions
- embedded generation assumptions, including their impact on network power quality
- modelling of contingent events
- value of customer reliability.

Spatial peak demand forecasts

Typically, network constraints occur during times of peak demand (peak demand refers to the maximum amount of electricity used by customers at any time). Forecasts of peak demand are therefore a key input to forecasting our augmentation expenditure. Spatial peak demand forecasts are prepared for small geographic areas of our network, and are reconciled to network-level peak demand forecasts.

3.2.4 NON-NETWORK—INFORMATION TECHNOLOGY CAPEX

Our non-network information technology capital expenditure forecast is developed to:

- manage and maintain our IT capabilities with a balanced approach to the cost and acceptable level of risk
- ensure IT capabilities are sustainable and reflect good industry practice
- adopt a common standards approach to both new and replacement IT solutions
- leverage new technologies to improve operational efficiency and effectiveness.

To prepare our IT capex forecast, we use a range of techniques, including top-down analysis and bottom-up builds of proposed projects. The forecasting process is explained in the following steps:

1. plan and cost the asset lifecycle for each IT asset in terms of augmentation, market growth, systems upgrades and end of life replacement

2. analyse changes in the business and the state of inflight projects, and consider opportunities to leverage new capabilities
3. engage to capture future state capability requirements that reflect customers' expectations and requirements and the direction of the business
4. conduct risk-based evaluations of the IT solutions that support business operations (for example, system upgrades), taking into account vendor roadmaps, support costs, ongoing maintenance costs and industry trends
5. investigate the use of new technologies that can deliver greater benefits to the business and its customers
6. develop cost estimates using a combination of historical financial information, competitive tender processes, benchmarking results, vendor negotiations, project mandates and business cases.

3.2.5 NON-NETWORK—OTHER CAPEX

Our capex in the non-network—other category predominately comprises the following items:

- vehicle fleet
- property and buildings
- tools and equipment.

Vehicle fleet

Vehicle fleet capex is forecast in accordance with our fleet asset class strategy—a strategic plan that sets out how and when we maintain and replace vehicles, to ensure they are fit for purpose and are acquired according to the least cent per kilometre principle. Vehicles forecast due for replacement (following assessment of their condition) are obtained in accordance with our procurement policy. We may also need to augment our fleet by purchasing additional assets on an as-needed basis—expenditure on new fleet assets is supported by a business case and undertaken in accordance with our procurement policy.

Property and buildings

Our capital expenditure on property and buildings is forecast using bottom-up cost builds, as supported by business cases.

Tools and equipment

Capex for our tools and equipment is forecast in accordance with our general tools and equipment strategy. This strategy sets out the equipment lifecycles for different assets. Capex on new and replacement tools and equipment is forecast on a 5-yearly rolling plan, with unit costs obtained in accordance with our procurement policy.

3.2.6 ADVANCED METERING INFRASTRUCTURE CAPEX

Our capital expenditure forecast for AMI includes the following activities:

- replacing end of technical life and defective meters and communication equipment
- upgrades of systems to maintain performance and supportability of services (including complying with new market requirements)

- installing meters for new customer connections
- maintaining communication systems to service new customers
- introducing new meter types into our meter base as new, efficient technologies become commercially available
- upgrading the software and hardware which supports metering systems.

We apply a bottom-up forecasting methodology that demonstrates, by activity, that the volumes and unit costs underpinning our forecast AMI capex are efficient and within the scope of what a prudent and efficient business should incur.

3.2.6.1 Forecasting approach

We will utilise a bottom-up cost build by activity to forecast our AMI capex. Activity volume forecast inputs to our AMI capital expenditure forecast include historical trends and customer number forecasts, and we also take into account compliance obligations such as meter specification and market settlement requirements. As with the other capex methodologies, we apply unit costs to forecast our AMI capex, using the same approach as with other network assets.

3.2.7 PUBLIC LIGHTING CAPEX

Public lighting capex is required to replace existing public lighting assets (such as light fittings, brackets, dedicated public lighting poles and cables) which have reached the end of their useful life and are no longer serviceable. In some cases, public lighting also requires replacement with modern equivalents to comply with government policies, such as those relating to the use of mercury in lights.

As new public lighting and alterations to existing lighting assets are fully funded by public lighting customers, our capex allowance only includes expenditure relating to the replacement of these assets. Capex to augment public lighting assets is therefore not covered by this document.

We forecast public lighting capex using methods similar to those described above for replacement capex, such as predictive models and historical trends.

4. OPERATING EXPENDITURE

4.1 INTRODUCTION

We intend to use a 'base, step and trend' approach to forecast our operating expenditure (**opex**) for the forecast regulatory period for most costs. Our approach aligns with the AER's preferred approach to forecasting most categories of opex, as outlined in the AER's expenditure forecast assessment guideline.

For those remaining costs (such as debt raising costs, guaranteed service level payments and demand side management), we intend to use a specific or bottom-up forecasting approach which better reflects the nature of these costs. To account for the expensing of (previously-capitalised) corporate overhead costs from January 2021 onwards, we will also include an adjustment (based on our revealed overhead expenditure) to our base-year expenditure as part of our opex forecast.

This chapter first describes our key opex categories for standard control services and then steps through our intended forecasting approach.

4.2 OPERATING EXPENDITURE CATEGORIES

Our forecast opex for standard control services can be split into maintenance, operating and other costs. The classification of opex into these categories is consistent with the categories the AER requires us to use in our annual reporting regulatory information notice (**RIN**) responses.

Figure 4—1 summarises these categories and identifies which method we intend to use for each category of standard control services opex.

Figure 4—1: Standard control services operating expenditure categories

		Base-step-trend	Specific forecast
Maintenance	Routine maintenance	●	
	Condition-based maintenance	●	
	Vegetation control	●	
	Emergency fault response	●	
	Inspection	●	
	SCADA/network control	●	
	Other maintenance costs	●	
Operating	Network operating (excl. GSL payments)	●	
	Billing & revenue collection	●	
	Advertising, marketing & promotions	●	
	Customer service	●	
	Regulatory	●	
	Regulatory reset	●	
	Information technology	●	
	Other operating costs	●	
	Licence fees		●
	GSL payments		●
	Non-network alternatives		●
	Debt raising costs		●

4.2.1 MAINTENANCE COSTS

Our network maintenance costs cover the operational repairs and maintenance of our distribution network, which includes both high voltage and low voltage assets. Costs include those for investigating, undertaking and testing the maintenance required by our assets but exclude costs which are treated as capex.

Table 4–1 describes our maintenance cost categories.

Table 4–1: Maintenance cost categories

Category	Description
Routine maintenance	Costs of recurrent and programmed activities undertaken to maintain assets, which are performed regardless of the condition of the asset. These activities are often undertaken at regular (predictable) intervals. Activities may include the inspection, survey, audit, test, repair, alteration or reconfiguration of assets.
Condition-based maintenance	Costs of activities undertaken to maintain assets, which are performed based on an assessment of the asset's condition. This expenditure may be more variable than routine maintenance expenditure as it is driven by the actual condition of assets. Activities may include the repair, service or alteration of assets (where not capitalised).
Vegetation control	Costs of activities related to the removal, alteration or management of vegetation, in order to maintain safe and/or regulated clearances from our assets. Activities include tree cutting, undergrowth control, root management, waste disposal, the use of herbicide and growth retardants, audit and the encouragement of low-growth vegetation to prevent the establishment of high-growth vegetation.
Emergency fault response	Costs incurred to restore a failed network component to an operational state. This includes all expenditure related to work where supply has been interrupted and assets damaged or rendered unsafe by a breakdown, making immediate repair or other work necessary. These activities are primarily directed at maintaining network functionality where immediate rectification is necessary due to a network safety, security or reliability issue. Such network failures may be caused by weather events, vandalism, traffic accidents or other physical interference by third parties. Due to the non-predictable nature of some of these events, our actual emergency response costs can vary widely from year to year.
Inspection	Costs of activities predominantly undertaken to discover and record information on asset condition, performance or other information. Activities may include the inspection, survey, audit or test of assets.
SCADA/network control	Costs of activities related to JEN's Supervisory Control and Data Acquisition (**SCADA**) and network control systems.
Other maintenance costs	All other operating expenditure relating to the maintenance of assets used to provide standard control services.

4.2.2 OPERATING COSTS

Our operating costs relate to the day-to-day operation of our network and delivery of services to our customers, covering the categories set out in Table 4–2.

Table 4–2: Operating cost categories

Category	Description
Network operating costs (excluding GSL payments)	Costs of network, control and management services that cannot be directly linked to a single specific operational activity (such as an instance of routine maintenance or vegetation management). These activities include network planning, network control and operational switching, quality standards, project governance, training and operational health and safety functions.

Category	Description
Billing & revenue collection	Costs associated with the billing of retailers and customers for the use of the distribution system and the associated collection of distribution revenue.
Advertising, marketing and promotions	Costs of advertising and marketing activities directly attributable to the provision of distribution services.
Customer service	Costs of providing a means for customers or members of the public to report network faults or safety hazards, customer complaints and other customer enquiries or service requests.
Regulatory	Costs of economic regulatory management for JEN, excluding those directly related to an electricity distribution price review.
Regulatory reset	Costs of economic regulatory management for JEN which relate directly to an electricity distribution price review.
Information technology	Costs of operating and maintaining the various IT and telecommunication systems required to effectively operate our network and facilitate our day-to-day operations.
Other operating costs	Other operating costs for standard control services not covered by other categories. This includes some costs of corporate support and management services provided by Jemena's corporate office that cannot be directly linked to a specific operational activity, including those of executive management, legal and secretariat, human resources, finance and other corporate head office activities or departments.
Licence fees	Cost of JEN's licence fee we are required to pay to the ESC.
Guaranteed Service Level (GSL) payments	Voluntary or mandated payments we make to a customer where they received service at a level below the prescribed guaranteed service level.
Non-network alternatives	Costs incurred to promote demand side participation among energy users, for example, incentives for customers to take up direct load control options or reduce peak demand.
Debt raising costs	Costs incurred each time debt is rolled over or issued, including underwriting fees, legal fees, company credit rating fees, other transaction costs and the costs of meeting credit rating requirements (for example, liquidity buffers and early refinancing).

4.3 BASE, STEP AND TREND FORECASTING APPROACH

We will employ the base, step and trend approach to forecast most our operating expenditure for standard control services and for type 5 and 6 (including smart metering) services.[5] This forecasting approach is consistent with the AER's expenditure forecast assessment guideline[6]. We will forecast operating expenditure for all other services on a bottom-up build basis.

Under the base, step and trend approach, costs are forecast using four broad steps:

- **Step one:** identify an efficient base year, based on our current and historical costs

[5] We expect Type 5 and 6 (including smart metering) services to continue to be classified as alternative control services, based on the AER's preliminary framework and approach for AusNet Services, CitiPower, Jemena, Powercor and United Energy for the regulatory control period commencing 1 January 2021.

[6] Australian Energy Regulator, *Better Regulation: Expenditure forecast assessment guideline for electricity distribution*, November 2013, p. 22.

- **Step two:** adjust this base year for non-recurrent expenditure and the expensing of corporate overheads
- **Step three:** trend the base year forward over the forecast regulatory period, taking into account expected changes in network scale, real input costs such as labour and materials, and productivity gains
- **Step four:** add or remove costs (not include in our base opex) related to expected changes in scope resulting from external factors outside of our control, related to the efficient deferral of capital expenditure in supporting dynamic efficiency.

Each step is explained in further detail below, and is summarised in Figure 4—2.

Figure 4—2: Base, step and trend approach

4.3.1 OUR BASE YEAR

We intend to use the 2019 calendar year as the efficient base year, given it will be the latest expenditure data available when the AER makes its final determination for JEN. As we have consistently underspent below our efficient opex and capex allowances, responding to the incentives provided by the regulatory framework (including the Efficiency Benefit Sharing Scheme) over a number of years, our actual operating costs from our base year represent the baseline from which a forecast of the prudent and efficient operating expenditure can be calculated.

4.3.2 BASE YEAR ADJUSTMENTS

We intend to adjust the base year to remove any one-off (or non-recurrent) costs, such as extreme weather events or organisational transformation costs. We will also adjust our base year to reflect changes to our treatment of corporate overhead costs. We would cease capitalising these costs from the start of the forecast regulatory period for both accounting and regulatory purposes, so will adjust our base year to ensure these costs are reflected in our total forecast operating expenditure. Our base year adjustment for the expensing of corporate overheads will be based on the actual costs which we currently capitalise.

4.3.3 TREND BASE YEAR

We intend to trend the base year forward to account for changes in:

- **network scale**—due to expected changes in customer numbers, energy throughput, peak demand, capacity and other relevant factors, changes in our activity levels may be required
- **real input costs**—due to expected changes in labour, the cost of the inputs we use may change over time
- **productivity**—due to developments in technology and other potential factors, changes in our productivity may be expected for the industry as a whole through the AER's current *Forecasting productivity growth for electricity distributors* review.

In some cases, we intend to engage experts to estimate expected changes in these cost drivers.

4.3.4 STEP CHANGES

We intend to add step changes, which can be positive or negative, to account for expected changes in scope due to factors outside our control. External factors include regulatory obligations, legislative impacts or outcomes from customer engagement, which may affect expected service levels. We may also include operating expenditure step changes which result from efficient trade-offs between capital and operating expenditure (for example, where demand management is used as a substitute for capital investment), where these are not captured in our efficient base year or trend escalation. We intend to use a bottom-up method to forecast the impact of step changes.

4.4 OTHER FORECASTING APPROACHES

Although we intend to use the base, step and trend approach for most standard control service operating expenditure costs, there are some exceptions where alternative approaches will be used.

Table 4–3 describes these alternatives for categories of standard control services opex and explains why they are preferred to the base, step and trend approach in each case.

Table 4–3: Alternative operating expenditure forecasting approaches – standard control services

Category	Forecasting approach	Why this approach is preferred to base, step and trend
Debt raising costs	These will be measured in basis points, which will be multiplied by the benchmark level of debt at the start of a year to determine the debt raising costs for that year.	This method is consistent with the AER's Post Tax Revenue Model handbook for distribution network service providers which requires benchmark debt raising costs, and is consistent with previous regulatory determinations by the AER for distribution network service providers.
Licence fees	Forecast on a specific basis, taking into account other available mechanisms for cost recovery of JEN's distribution licence fee.	This cost is set by the Victorian Minister for Finance and is not affected by the same trends accounted for in the base, step and trend forecasting approach.
GSL payments	Forecast based on the average number of GSL payments made over a number of years.	These costs are not affected by real input cost or productivity changes as they are set within the Victorian electricity distribution code.
Non-network alternatives	Forecast on a case-by-case basis, after assessing the net present value of each project, in a similar way to the forecasting approach used for our capital program.	This expenditure is discretionary by nature and justified by outcomes, such as efficiently addressing an identified network constraint, but is generally not accounted for in the base, step and trend forecasting approach.

In addition to using a bottom-up approach for the standard control services opex categories identified above, we will also forecast opex for all alternative control services (other than type 5 and 6 (including smart metering) services) using bottom-up builds.

5. LINKS BETWEEN CAPITAL AND OPERATING EXPENDITURE FORECASTS

We intend to develop our capital and operating forecasts consistent with each other, including taking account of any interactions between the two. Interactions between our capital and operating expenditure forecasts may include:

- reflecting changes to operating expenditure due to any efficiencies (or inefficiencies) which result from changes in our capital expenditure
- ensuring that consistent inputs are reflected in both our capital and operating expenditure forecasts, such as expected network scale and real input cost changes
- ensuring that costs are not double counted in, or excluded entirely from, both our capital and operating expenditure forecasts.