CitiPower, Powercor and United Energy
Forecasting methodology | 2021–2025

Our forecasting methodology describes our proposed approach for estimating operating and capital expenditure for the 2021–2025 regulatory control period. Our forecast methodology will apply to both our network and metering services.[1]

Our aim is to provide clarity and transparency to the Australian Energy Regulator (**AER**), customers and other stakeholders of our intended forecasting methodology. This document also allows the AER to identify additional information needed to support its assessment and understand how our methods align with its *Expenditure forecast assessment guideline 2013*.

Further details about our forecasting methodology, including inputs and key assumptions, will be included in our 2021–2025 regulatory proposal. Any changes to our proposed methodology will also be explained in our regulatory proposal, to be submitted to the AER in July 2019.

[1] Services classified as standard control services or type 5, 6 and smart metering alternative control services.

1.1 Overview of our forecasting methodology

The figure below provides an overview of our method for developing our expenditure forecasts. Our method involves assessing our underlying expenditure drivers, identifying the most efficient long term approach (taking into account uncertainties and optimal timing) to address these drivers and forecasting the efficient costs of delivery to ensure the best outcomes for customers.

Figure 1 Overview of expenditure forecasting approach

The following sections describe each of these steps in more detail:

- **section 2** explains what our expenditure drivers are, how we forecast these and how we assess the most efficient approach to address them
- **section 3** explains how we forecast efficient capital expenditure
- **section 4** outlines how we forecast efficient operating expenditure.

1.2 Our expenditure drivers

We develop our expenditure forecasts by first undertaking a holistic review of our underlying expenditure drivers. The table below sets out our key expenditure drivers and our forecasting approach.

We consider a broad range of approaches for addressing our expenditure drivers, including:

- investment in new, changed or replacement network assets (network capital expenditure)
- demand management solutions which could enable efficient deferral or avoidance of network capital expenditure. We seek non-network alternatives through engagement with stakeholders on our demand side engagement register, public forums and publication of our Distribution Annual Planning Report which identifies the size, location and timing of network constraints. We also encourage customer participation in demand response programs
- investment in information and communications technology advancements which could enable efficient deferral or avoidance of network capital expenditure through better management and utilisation of the existing network
- operating expenditure solutions, such as leasing assets, engaging services (including demand management services) and increased maintenance of assets, instead of purchasing new or replacement assets.

We compare the relative long term costs, benefits and risks of the different approaches. Ultimately, our expenditure forecasts are based on the approach which is expected to provide the most efficient long term outcome for customers, both in terms of costs and ensuring we maintain a safe, reliable and secure electricity supply.

Table 1 Expenditure drivers and forecasting approach

Key driver	Forecasting approach
Stakeholder engagement Ensuring we provide services that customers want. This includes accommodating feedback and insights on desired services and directly engaging with customers on demand response and innovative trials.	Stakeholder feedback is gathered through everyday engagement and feedback and our regulatory reset specific stakeholder engagement program. Our stakeholder engagement program involves various methods for gathering views across a broad range of customers, customer representatives and key industry stakeholders.[2]
Customer and demand growth Accommodating growth in customers and location specific peak demand on our network.	Customer and peak demand growth are forecast using a combination of internal bottom up forecasts and externally developed top down forecasts. Our forecasts take account of macro-economic conditions, customer usage trends including technology usage such as residential solar PV and batteries, localised demand and supply factors, and known customer connections and load changes.
Evolving energy market Accommodating increasing uptake of distributed energy resources, including solar and batteries, which impact demand and supply profiles and quality of electricity supply.	Distributed energy resources forecasts are based on externally sourced macro level forecasts which we map to our network using historical trends and known projects.
Asset risk Managing changing risk as the condition of some of our network and non-network assets deteriorate over time due to factors such as age, utilisation, safety, environmental conditions and lifecycle maintenance, becoming susceptible to faults.	Forecast asset condition is based on current asset condition and performance, asset age, lifecycles and defect trends.

[2] For further information on our stakeholder engagement program please refer to https://talkingelectricity.com.au/

Key driver	Forecasting approach
Network safety	
Ensuring our network is safe for customers and employees and the risk of our network contributing to a fire start is minimised.	Forecast network safety drivers are based on our current safety performance, identified safety risks and changes in safety standards or safety-related regulatory obligations.
Technological change	
Increased opportunities for automation and digitisation in the operation of the network and greater channels for sharing information with customers and third parties.	Technological change is forecast by undertaking market scans, international reviews and seeking advice from technical experts and vendor support services.
Regulatory obligations	
Ensuring compliance with changes in regulatory obligations and service standard requirements.	Forecasts of future regulatory obligations are based on identification of new, removed or changed obligations.

1.3 How we forecast capital expenditure

We forecast capital expenditure both for new assets and through modifying, expanding or replacing existing assets to ensure the delivery of a safe, secure and reliable supply of electricity for our customers.

When we identify that a capital works solution is the most efficient approach to address our expenditure drivers, we undertake the following to ensure our forecast costs are efficient:

- robust options assessment
- forecasting efficient volumes and unit costs
- optimisation of our total capital works portfolio.

1.3.1 We undertake robust options assessment

To forecast our capital works programs we undertake a robust options assessment, including assessing different project scopes, designs and timings. We choose the option which provides the greatest net benefit to customers, taking into account the long term costs, benefits and risks. Our assessment of customer benefits incorporates the value of reliability, safety and the environment at risk if we delay or de-scope capital works programs.

For large projects over $5 million we prepare business cases which are based on the approach required under the AER's Regulatory Investment Test for Distribution (**RIT-D**).

1.3.2 We forecast volumes and costs to ensure total project costs are efficient

We forecast the volume of assets required based on a range of factors including, where relevant, asset condition and risk assessments, historical trends, historical defect rates, forecast capacity constraints, forecast asset inspections, known customer projects and asset age and lifecycles.

Our forecast volumes are determined in accordance with our investment and asset management policies. Our policies are consistent with industry best practice and take into account network characteristics and operating environments. Key policies include our:

- asset management framework which sets out the criteria we apply for maintaining and replacing our existing assets to ensure a safe, secure and reliable network. Our asset management framework is aligned with ISO55000, an international standard for asset management
- network planning policies and guidelines which outline the criteria we apply to identify network constraints and the long term augmentation capital expenditure required to meet forecast electricity demand and maintain quality of electricity supply
- demand side engagement strategy which sets out our framework and processes for investigating and assessing demand side options, including our engagement process with non-network providers.

We forecast costs for capital projects based on recent historical costs for efficiently delivered projects of similar scope, size and geographic locations and/or rates from service providers, derived from periodic tendering where available and appropriate. We adjust costs for forecast growth in real input prices over time, such as labour, materials and contracted services.

Our approach to forecasting by capital expenditure category is described in the table below.

Table 2 Forecast method by capital expenditure category

Replacement	Augmentation	Bushfire	Connections	Non-network
Replace existing network assets, generally due to condition deterioration causing unacceptable safety, reliability or environmental risks	**Demand driven works to meet localised growth and demand at peak times, and non-demand driven works to maintain reliability, security and quality of supply**	**Bushfire and safety works driven by bushfire and other safety risks or requirements**	**Additions, upgrades or alterations to the shared network to meet the requirements of specific customer connections**	**Maintain, upgrade or replace information technology (IT), property, vehicles or equipment to support our network operations**
• Forecast replacement of high volume, low cost assets (e.g. poles and pole-top structures, and lines) are set to maintain current levels of reliability across our network. Forecast volumes are typically based on observed historic trends, adjusted for any known change in operational policy or asset-specific issues. This recognises that failure rates typically increase as assets age. • Forecast replacement of low volume, high cost asset works (e.g. zone substation transformers) are based on risk assessments of individual assets. Risk assessments compare a monetary value of the likelihood and consequence of failure on reliability, safety and the environment against the cost of options to manage risks, which can include replacement, refurbishment, or other options.	• For demand driven constraints, projects are identified by comparing forecast load growth against current network capacity. The energy at risk of not being supplied is assigned a monetary value based on how much customers value reliability. Our augmentation forecast only includes capital works where the cost of mitigating a forecast constraint is lower than the monetised value of energy at risk and a lower cost demand side solution is not feasible. • Non-demand driven works are forecast by considering the impact of future fault current, voltage quality and security of supply requirements and whether these factors are forecast to exceed the levels stipulated by regulatory obligations.	• We primarily forecast capital works related to bushfire and other safety obligations based on a bottom-up build of a project scope.	• For high volume connections we use a top down forecasting approach which involves applying growth indices to each of our customer connection expenditure categories to forecast future volumes off historical volume baselines. • For low volume connections we use a bottom up approach based on a combination of known planned connections and historical volumes and/or expenditure.	• For IT assets we forecast the volume of system upgrades required to maintain current IT capability based on vendor support requirements and upgrade releases. We forecast new or increased IT capabilities based on identified need, supported by cost-benefit analysis. • We forecast the volume of property upgrades required based on a review of existing facilities to identify any changes needed to meet current health and safety requirements and/or operational requirements to maintain network performance. • We forecast volumes of vehicles, tools and equipment replacements based on historical investment rates, asset age and lifecycles.

1.3.3 Our capital expenditure forecasts are optimised to ensure efficiency at a total portfolio level

We review the reasonableness of our aggregate bottom up forecasts using top down approaches including:

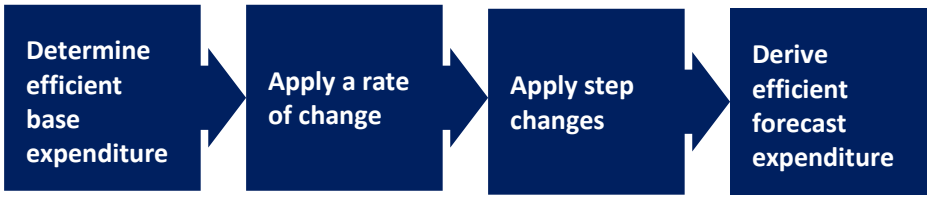
- comparing different capital works programs to assess whether there are opportunities for aligning program timing to achieve synergies in scope and works delivery. As a result some forecast capital works programs may be deferred or bought forward in time
- assessing the deliverability of our forecast total portfolio of works given our forecast resourcing levels. This may result in work programs being reprioritised or changes to the mix of internal and external resources required to support delivery
- cross-checking our forecasts against the AER's assessment techniques set out in its *Expenditure forecast assessment guideline 2013*, including the AER's expenditure models (e.g. repex and augex models) and trend analysis. We compare our forecasts with the outcomes of the AER's assessment techniques, assess reasons for divergences and consider whether any forecasting adjustments are required. Differences between our forecasts and the AER model predictions may arise due to differences in asset coverage and expenditure drivers.

1.4 How we forecast operating expenditure

We forecast operating expenditure using the base-trend-step approach, consistent with the AER's preferred assessment approach specified in its *Expenditure forecast assessment guideline 2013*. Under this approach we:

- determine the efficient base year of expenditure (base)
- apply a rate of change for growth in real input prices, network size and productivity (trend)
- adjust for step changes in scope occurring in the next regulatory control period (step).

Figure 2 Overview of operating expenditure forecast approach



1.4.1 Our base operating expenditure is efficient

Operating expenditure involves those day-to-day costs for running our networks including network maintenance and operations, IT and support services, vegetation management, customer service and emergency response.

We nominate the fourth year of the 2016–2020 regulatory control period, being 2019, as the base year. This will be the most recently available actual audited operating expenditure performance at the time the AER is required to make its distribution determination.

Our 2019 operating expenditure will reflect an efficient base because:

- we operate under the AER's Efficiency Benefit Sharing Scheme (**EBSS**). This scheme provides strong incentives for us to continuously seek efficiencies in our operating expenditure and share these savings with customers. Our

historical expenditure demonstrates we respond to the incentives and have achieved efficiency savings for customers during the 2016–2020 regulatory control period

- we continue to perform well on the AER's operating expenditure benchmarks, which compare the relative operating expenditure performance of distribution electricity networks in Australia over time.

Adjustments to our 2019 operating expenditure will be made for certain material categories of non-recurrent expenditure. This includes service classification changes and costs with high annual variation, for example Guaranteed Service Level payments.

1.4.2 We escalate our base year expenditure forecasts for trend growth

We apply a rate of change to trend the base expenditure into the future. Our rate of change approach is consistent with the AER's *Expenditure forecast expenditure assessment guideline 2013*. The rate of change includes:

- real price escalation – we apply forecast real price escalation to our input costs for labour and non-labour inputs to reflect expected price changes in future. Our real price escalation forecasts will be based on independent forecasts
- output growth – we forecast increased operating expenditure to meet network growth over the 2021–2025 regulatory control period. Our forecasts will be based on the AER's standard approach, which includes growth in customer numbers, peak demand and line length. We will forecast growth in these factors through a combination of independent sources, internal forecasts and historical growth
- productivity growth – productivity growth reflects shifts in the production possibility frontier driven by technology advancements or other innovations. It does not reflect reductions in operating expenditure from removing inefficiencies.

1.4.3 We adjust our escalated base year expenditure forecasts for expected step changes

Next, we adjust our base operating expenditure to account for step changes. A step change involves activities that increase our costs during the regulatory control period and are not already captured in base expenditure.

Activities impacting the scope of our operating expenditure include changes in regulatory obligations, substitutions between operating and capital expenditure (for example demand-side management alternatives to network capital expenditure), technological change and other material changes in cost drivers.

Our step changes are forecast taking account of expenditure already captured in our base expenditure and expenditure growth provided for through the rate of change. Step changes will be supported by business cases demonstrating the benefit to customers.

Using the above process, we derive our total operating expenditure forecast as shown in the figure below.

Figure 3 Our operating expenditure forecasting approach