Essential Energy's Expenditure Forecasting Methodology

2024-29 Regulatory Proposal

Contents

1. Overview

1.1. This document

This document responds to Clause 6.8.1A of the National Electricity Rules (NER), which requires Essential Energy to inform the Australian Energy Regulator (AER) of the methodology Essential Energy proposes to use to prepare the forecasts of operating expenditure ('opex') and capital expenditure ('capex') that form part of Essential Energy's regulatory proposal for the regulatory control period commencing 1 July 2024. Essential Energy is required to provide this 'forecast methodology statement' to the AER 24 months before the expiry of the regulatory control period ending on 30 June 2024.

This statement provides an overview of the methodologies Essential Energy proposes to adopt in forecasting operating and capital expenditures in the regulatory proposal to be submitted in January 2023. Full details of these methodologies, including key variables and key assumptions, will be included in the regulatory proposal.

Essential Energy understands that the purpose of providing this forecast methodology statement is to commence early engagement between Essential Energy and the AER on the forecast methodology, to assist the AER in its assessment of Essential Energy's proposed forecast operating expenditure and capital expenditure.

It is possible, though unlikely, that Essential Energy may have to amend its proposed approach to forecasting expenditures to cater for changes in circumstances or the outcomes of customer consultation between the time of lodging this method and the submission of the regulatory proposal. However, these changes, if required, are not anticipated to be significant. The forecast methodologies for operating and capital expenditures are outlined in sections 2 and 3, respectively.

Below we present key context for our expenditure forecasting methodologies, including information on Essential Energy, our customer and stakeholder engagement process and our Asset Management System (AMS). Our customer and stakeholder engagement process and AMS play key roles in guiding and informing our expenditure forecasts.

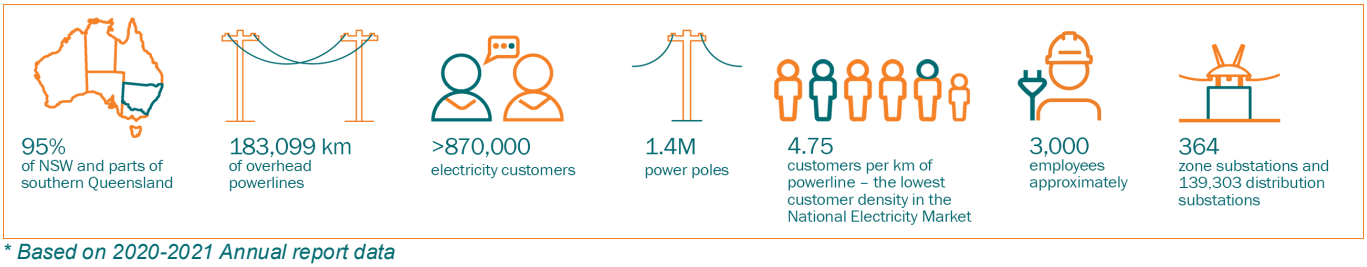
1.2. About Essential Energy

Essential Energy is 100 per cent owned by the NSW Government. Our core business is building, operating and maintaining one of Australia's largest electricity networks. We are focused on delivering electricity to our customers safely, reliably and sustainably, while maintaining downward pressure on customers' network charges. We are guided by our vision to empower communities to share and use energy for a better tomorrow.

Our network spans 95 per cent of New South Wales and parts of southern Queensland, providing electricity network services:

- to more than 870,000 homes and businesses in 1,500 regional, rural and remote communities; and
- that involve the building and maintenance of 737,000 square kilometres of network, encompassing over 180,000 kilometres of powerlines, 1.4 million power poles, 139,303 distribution substations and 364 zone substations across extremes of terrain and climate.

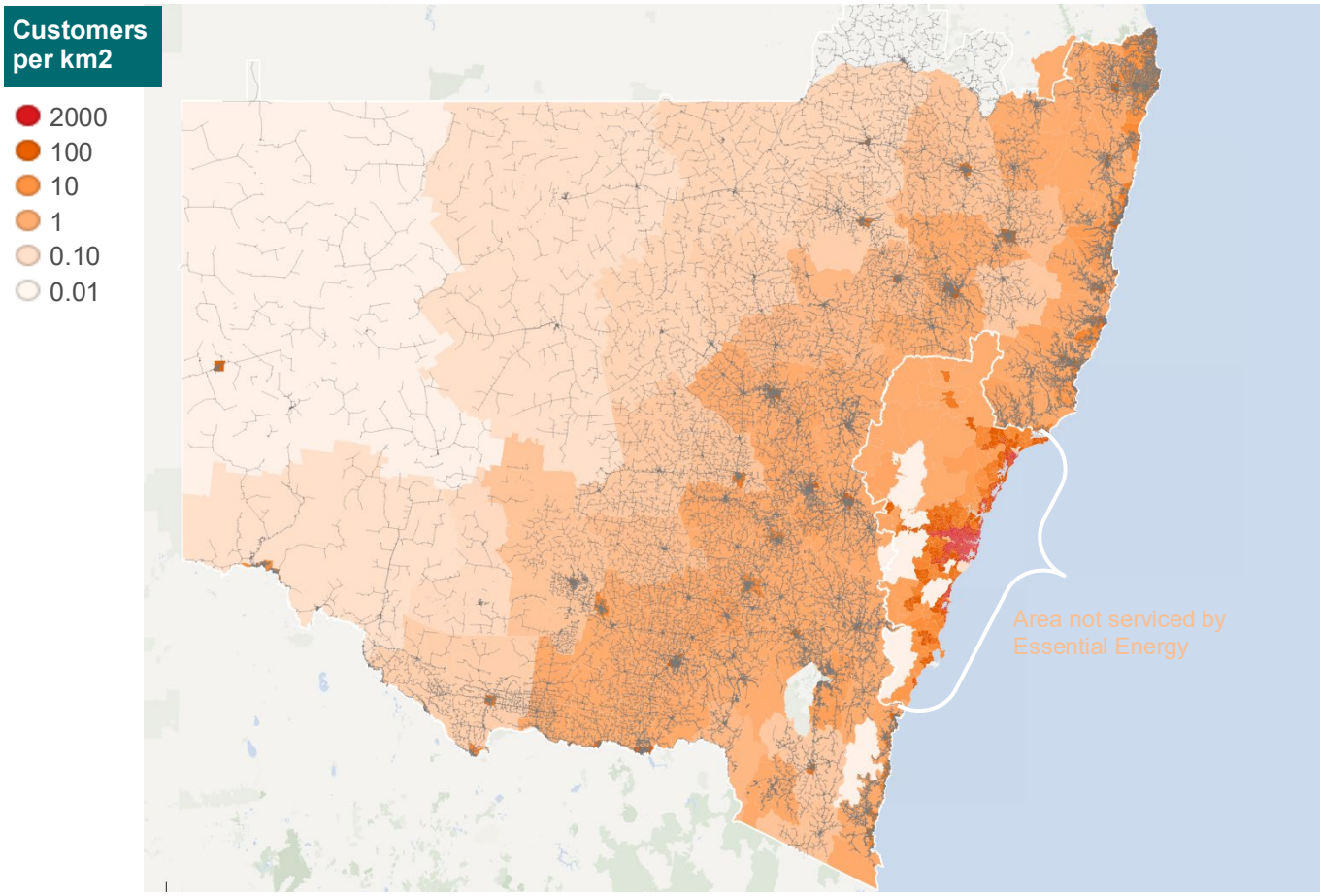
Figure 1: Facts about Essential Energy's network



** Based on 2020-2021 Annual report data*

Essential Energy's network is characterised by medium to very low customer density. This is demonstrated in Figure 2, which shows Essential Energy's electricity network overlayed by NSW customer numbers per square kilometre.

Figure 2: Customer density



Our network reaches customers in the most far-reaching corners of NSW and is like no other network in Australia. It is unique in terms of the geographic area it covers, the terrain it traverses, the vegetation that grows within it and the diversity of weather it is exposed to.

The majority of costs associated with electricity distribution are driven by the number of assets required to deliver electricity to each customer, not by the number of customers or their demand on the network. Whether there are 50 customers connected to one pole or 50 poles connecting one customer, each asset needs to be inspected, safely maintained, and replaced at the end of its life.

Some of the key challenges faced when operating and maintaining such a diverse network include:

- the scale of the network;
- the number and age of assets;
- vegetation management;
- extreme variations in both weather and terrain;
- low customer density; and
- working with a network that was built over time.

Increasingly, we are also focused on:

- **Evolving in response to changes in the electricity market and customer needs**, including supporting new technologies such as solar, batteries, electric vehicles, and energy exchange. The energy industry is in the midst of unprecedented change. Customers continue to seek services that are safe, reliable and affordable, but many also now want the flexibility to export to the grid from their own solar electricity generation and storage systems. With the increasing adoption of Distributed Energy Resources (DER), we need to ensure that our network adapts to manage more two-way power flows – both to and from customers – without compromising reliability and safety. We are therefore working to optimise integration of DER and network performance for DER.
- **Ensuring our network is resilient and reliable**, particularly in response to the increasing frequency of extreme weather events in recent years (including severe bushfires, storms and floods) and the changes occurring in the energy market (mentioned above), through measures such as efficient vegetation management, contingency planning, new solutions such as stand-alone power systems and composite poles, and our asset inspection and maintenance regime.

- **Continually improving our performance and providing greater value to our customers**, through implementing improved business planning and management systems, streamlining our operations and processes, improving how we manage our assets and through our work in building community resilience.

1.3. Customer and stakeholder engagement in developing our Regulatory Proposal

We listen to and respect our customers, safely deliver on our promises, and place our customers at the centre of everything we do. Our customer experience vision is 'everyday excellence, every customer, every interaction'. Our Customer Experience Strategy, released in October 2020, continues to drive our progress in this area.

Our 2024-29 Regulatory proposal is being developed with our customers and other stakeholders through co-design workshops. Therefore, as outlined in Section 2 and Section 3 below, customer views will play a key role in shaping our operating and capital expenditure forecasts. Our engagement program builds upon our existing engagement channels which are now embedded as business as usual requirements. We have also engaged on specific topics such as tariff trials and our cost pass through applications (additional costs due to the 2019-20 bushfires and changes to licence conditions).

Below is an overview of our engagement plan followed by a high-level summary of the customer and stakeholder engagement process we will follow in developing our 2024-29 Regulatory Proposal, which will outline our expenditure forecasts.

Figure 3: High-level engagement plan

	Planning (Jul – Sep 2021)	Phase 1 Setting the Scene (Oct – Dec 2021)	Phase 2 Understanding our Customers (Jan – Apr 2022)	Phase 3 Investment options forum and collaborative deep dive (Apr – Jul 2022)		Phase 4 Testing the Proposal (Sept – Oct 2022)
Engagement	• Stakeholder co-design workshop • Essential Connectors meeting • Develop Stakeholder Collaboration Collective (SCC)	• SCC Meetings • Consumer testing of materials • Online Virtual drop-in • Visioning forums • Groups and in-depth interviews	• SCC meetings • Consumer testing of materials • Online Virtual drop-in • Deliberative forums • Groups and in-depth interviews • Mixed mode telephone and online survey • Develop Pricing Collaboration Collective (PCC)	• SCC meetings • PCC meetings • Consumer testing of materials • Online Virtual drop-in • Investment options forums • Groups and in-depth interviews • Pricing deep dive sessions	Draft Regulatory Proposal	• SCC Meeting • PCC Meeting • Test draft Regulatory Proposal with customers and stakeholders
Outcomes	• A leading edge engagement plan • Know who to engage with, what to engage on; and how to engage	• Informed participants • Customers' future vision and what's important to them • Identification of what information they might need in order to make informed decisions	• Participants informed at a higher level • A clear understanding of customers' views and priorities in relation to the key issues	• Identification of program preferences • Development of proposals based on customer and stakeholder collaboration		• A Regulatory Proposal developed collaboratively and supported by customers and stakeholders • Evaluation Report

1.3.1. Nature of stakeholder engagement

Given our collaborative approach to engagement, our engagement plan will flex as required to meet the needs and expectations of our customers and stakeholders. Key elements of our engagement program include the following:

We have planned four phases of engagement, with each phase building on the previous phase (see Figure 3).

- To help build customers' knowledge we have developed an Essential Engagement website that includes a Virtual Room that provides customers with 24/7 access to read about and consider upcoming topics. The virtual room is updated at the start of each phase to introduce any new material and 'close the loop' on the previous phase.
- We have a range of groups to guide our thinking, the development of our engagement materials and assist with decision making along the way – including our Customer Advocacy Group, Stakeholder Collaboration Collective and our Pricing Collaboration Collective. The Stakeholder Collaboration Collective, is our primary reference point and we meet with them on a fortnightly basis. Our Pricing Collaboration Collective meets monthly.
- As part of our flexible engagement plan, it was identified that deep-dive sessions with a small group of customers were required in relation to some matters. These were slotted in as part of our phase 3 engagement .

1.3.2. Breadth and depth of stakeholder engagement

As part of our engagement planning phase we held a co-design workshop with stakeholders, and identified four themes for the Regulatory Proposal - these are:

- Network of the Future
- Resilience and Reliability
- Pricing
- Other Essential Services

The engagement topics (and the Virtual Room) have been linked to these themes. For each topic, our level of engagement with stakeholders is based on the impact of the topic on customer prices as well as the ability of customers and stakeholders to influence the outcome. The bulk of our customer and stakeholder engagement around our proposed expenditure is being undertaken using bill impacts at a topic level, and we are relying on our Stakeholder Collaboration Collective for detailed discussions around our capex and opex forecasts.

We are engaging with a diverse set of customers and stakeholders, including:

- Residential and small business customers through forums in seven locations across the state. We are targeting 440 customers in each phase of engagement in the locations of Broken Hill, Inverell, Ballina, Taree, Dubbo, Wagga Wagga and Bega.
- A youth group in phases 1 and 2
- In-depth interviews in each phase of engagement with:
  - Aboriginal and Torres Strait Islander customers
  - Culturally and linguistically diverse customers
  - Commercial & Industrial customers
  - Retailers and Aggregators
- Group discussions in each phase of engagement with:
  - Councils
  - Renewable developers
  - New technology providers
  - Advocates.

We are also engaging with Accredited Service Providers, critical infrastructure providers and the NSW Department of Planning and Environment as appropriate throughout the process.

Customers in locations outside of the forum areas, especially those in areas that suffer from poor internet connectivity, were encouraged to 'have their say' on shaping our Regulatory Proposal via a broad marketing campaign in phase 2 and 4. The marketing campaign suggests using a local library to view our engagement website where they can elect to complete surveys or contact us directly with any feedback.

1.3.3. Clearly evidenced impact

At the start of each phase of engagement we are 'closing the loop' on what we last heard from customers and stakeholders. This includes explaining what we heard and how we have responded, including why any suggestions have not been taken further. Our Draft Regulatory Proposal will include comprehensive content about our engagement program. Reports for each phase of engagement will also be published.

We have commissioned an independent consumer report on our engagement program, which will be submitted with our Draft Regulatory Proposal and Regulatory Proposal. The independent consumer report will be prepared on behalf of our Stakeholder Collaboration Collective. Whilst Essential Energy will fund the report, the tender selection was undertaken by Stakeholder Collaboration Collective members and Essential Energy will not be involved in the report preparation.

1.4. Asset Management System

We adopt a risk-based approach to asset management that seeks to balance preferred customer outcomes with the investments required to deliver them. We use robust risk and asset management strategies to ensure the network is sustainable in the long-term, including continually improving whole-of-life asset planning that prioritises where and when we spend money during each asset's lifecycle. For example, we will manage defects that are identified during inspection regimes in a way that is low cost and minimises planned outages, while maintaining the reliability and safety of the network.

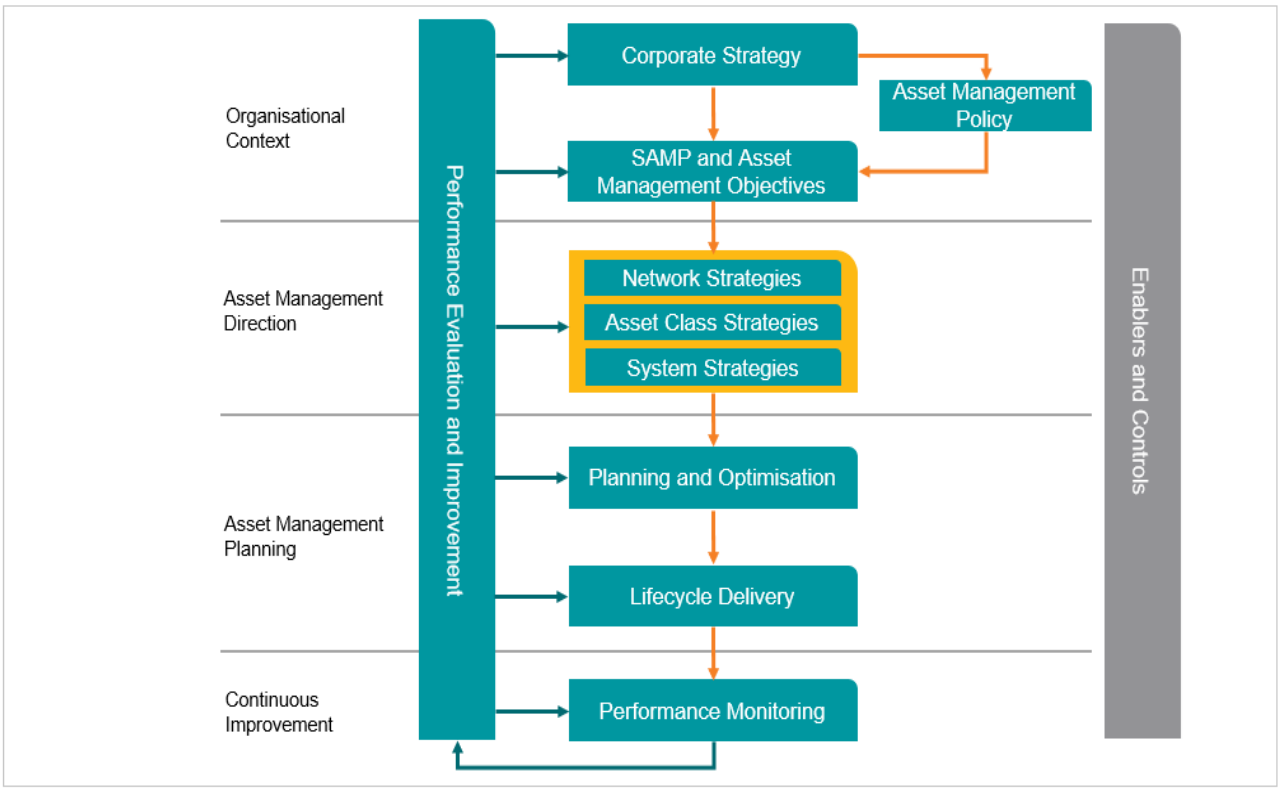
Our asset management systems and processes are consistent with industry best practice, including:

- a continuous improvement approach to best practice asset management aligned with the principles of the ISO 55000 set of standards
- deployment of appropriate risk management techniques and policies
- asset investment and decision optimisation, driven by the quantification of risk to allow cost benefit analysis

- implementation of comprehensive asset information and management systems
- fit for purpose governance and business processes for setting and implementing capital and operating budgets; and
- business reporting and performance management.

Our Asset Management System (AMS) achieved accredited certification against AS ISO 55001:2014 in January 2022. A high-level overview of Essential Energy's AMS is shown in Figure 4.

Figure 4: High level graphic of Essential Energy's Asset Management System



In April 2021 Essential Energy received an Asset Management Excellence Award from the Asset Management Council for our asset management strategies. This recognised that our approach to asset management best balances cost, risk and performance, to put downward pressure on costs to customers while maintaining appropriate levels of risk and reliability.[1]

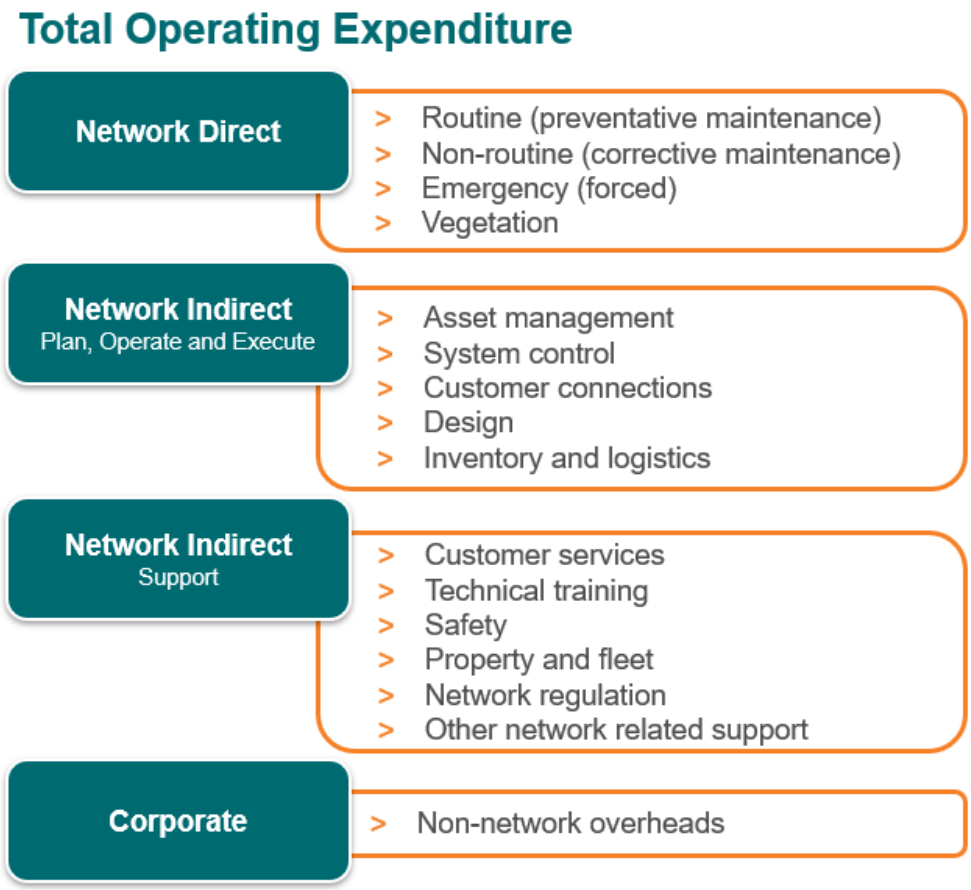
[1] Essential Energy, Annual Report 2020-21, p 16; and Asset Management Council – Asset Management Excellence Awards 2021, https://www.amcouncil.com.au/news/61-awards/100112-asset-management-council-%E2%80%93-asset-management-excellence-awards-2021.html, accessed 31 March 2022.

2. Forecasting methodology – Operating Expenditure

2.1. Our operating expenditure

Operating expenditure includes a wide range of non-capital costs we incur in providing our network services to customers, such as vegetation management, maintenance, emergency response, system control, network support and corporate overheads. These costs can be categorised as direct expenditure on the network, indirect expenditure on the network and corporate costs (see Figure 5). All of these categories of operating expenditure contribute to ensuring the network is efficient, safe, resilient and reliable, consistent with the needs of customers.

Figure 5: Operating expenditure categories



2.2. Operating expenditure objectives and criteria under the National Electricity Rules

Section 6.5.6 of the National Electricity Rules (NER) establishes operating expenditure objectives, criteria and factors.

2.2.1. Operating expenditure objectives

Under the NER, a Distribution Network Service Provider's (DNSP's) forecast operating expenditure must be required to:

- meet or manage expected demand for standard control services over the period
- comply with applicable regulatory obligations or requirements associated with the provision of standard control services
- maintain the:
  - quality, reliability and security of supply of standard control services
  - reliability and security of the distribution system through the supply of standard control services; and
  - safety of the distribution system through the supply of standard control services.

2.2.2. Operating expenditure criteria

The AER must accept the DNSP's forecast operating expenditure if it is satisfied that it reasonably reflects:

- the efficient costs of achieving the operating expenditure objectives; and

- the costs that a prudent operator would require to achieve the operating expenditure objectives; and
- a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

2.2.3. Operating expenditure factors

In assessing a DNSP's proposal against the operating expenditure criteria, the AER must have regard to:

- the most recent annual benchmarking report and the benchmark operating expenditure of an efficient DNSP
- the actual/expected operating expenditure of the DNSP during the preceding regulatory period
- customer views and concerns
- substitution options between operating expenditure and capital expenditure
- consistency with incentive schemes
- whether the forecast includes expenditure that should be part of a contingent project
- the extent to which the DNSP has considered efficient non-network options
- any relevant final project assessment report, and
- any other factor, as notified by the AER.

2.3. Approach to forecasting operating expenditure

Our methodology for forecasting our operating expenditure requirements over the 2024-29 regulatory period will use the 'Base-Trend-Step' approach set out in the AER's Expenditure Forecast Assessment Guideline[2] and its Better Resets Handbook, supplemented with the outcomes of consumer engagement.[3]

2.3.1. The Base, Trend, Step approach to forecasting operating expenditure

Our forecast opex will be calculated as follows:

Base year opex

- Estimates of our operating expenditure in 2022-23 less costs unlikely to recur over the 2024-29 regulatory period, as the 'base' for our forecast.
- 2022-23 is the preferred base year because 2019-20 was impacted by bushfires and 2021-22 contained significant changes from implementing a new ERP system
- We expect that benchmarking analysis will confirm that our estimated opex in 2022-23 is efficient – it also reflects productivity improvements and efficiency gains realised by Essential Energy over the last two determination periods.

+ Trend

- Our base year opex is scaled up each year over the 2024-29 to account for the net effects of:
  - output growth – econometric analysis used to determine the relationship between forecast changes in outputs (customer numbers, line length, demand) and our efficient opex;
  - real price growth - includes real labour price growth and real non-labour price growth, to reflect expected increases in the future price of inputs; and
  - productivity growth - we will apply a productivity factor (noting that the AER's preferred productivity growth forecast is currently 0.5% pa).
- Rate of change ('Trend') = output growth + real price growth – productivity growth.

+ Step

- Other costs not captured in the base year or in the trend, that will be needed to meet the opex criteria, e.g., changes arising from new regulatory requirements, major external factors, or efficient opex / capex trade-offs.
- We will be exploring any proposed step changes with customers
- We will only propose step changes where they are necessary and well justified.

+ Other

- Additional costs that have not been appropriately forecast in either the base, trend, or step items.
- This includes category-specific forecasts; forecasts that should be separated for either volatility or for consistency with other elements of the opex approach.
- If any new category-specific forecasts are warranted, we will discuss this with consumers and with the AER.

= Forecast opex

2.3.2. Customer engagement has informed operating expenditure forecasts

In developing our forecast operating expenditure for the 2024-29 regulatory proposal, we have engaged with customers and other stakeholders to understand their views and preferences (see section 1.3 above for details on this engagement process). This has included engagement on 'draft' operating expenditure forecasts. Customer feedback has informed and refined our operating expenditure forecasts and our regulatory proposal. In particular, we sought customer preferences on which investments were most important to them and what they were willing to pay for different

2 AER, Expenditure Forecast Assessment Guideline for Electricity Distribution, November 2013.

3 AER, Better Resets Handbook – Towards Consumer Centric Network Proposals, December 2021.

investments. We explained and made sure customers understood the trade-offs between options (see section 3.3.3 below for more detail on options discussed). We will consider customers' feedback in finalising our forecasts.

Our regulatory proposal to the AER will also:

- Detail how our forecast operating expenditure is consistent with or takes into account consumer preferences and outcomes identified in the course of consumer engagement
- Identify if/where our forecast operating expenditure departs from the AER's base, trend, step approach and/or the expectations outlined in its Better Resets Handbook (e.g., in relation to specific elements within the base, trend, step approach, such as the productivity growth factor to apply in the trend), and provide evidence that the deviation in approach has been discussed with consumers, and how consumer views have been taken into account
- Highlight any parts of our operating expenditure proposal that are either not supported by customers or have not been the subject of customer engagement.

3. Forecasting methodology – Capital expenditure

3.1. Our capital expenditure

Capital expenditure refers to the money required to build new assets, or to replace or refurbish existing assets to provide standard control services. We incur capital expenditure to ensure that we can provide safe, reliable and resilient network services.

Our capital expenditure categories include network augmentation, asset replacement, customer connections, and non-network such as ICT, fleet and property. Figure 6 describes the key categories of capital expenditure and the drivers of investment.

Figure 6: Capital Expenditure categories and drivers of investment

System

Category	Sub-Category	Description
REPEX	Network asset renewal	Planned asset replacement, refurbishment, retirement, or de-rating based on asset age, risk, service cost, or condition
	Non-network assets	Network replacement stand-alone power systems (SAPS), new compliance obligations, improved safety outcomes, etc
AUGEX	Load Growth	Works to address imbalances in supply and demand for customers due to thermal and voltage constraints
	Non Load	Works to address constraints in the network (e.g. voltage, fault levels) related to capacity changes with focus on safety, protection, compliance programs, and network metering and monitoring
	Resilience	Works on hardening the network to improve response times following major incidents
	Non-network	New infrastructure such as microgrids
	Reliability	Augmentation work to address reliability issues
Connections		Works to establish new customer connections or increase capacity of existing customer connections
Distributed Energy Resources (DER)		Development of hosting capacity in the network to facilitate increased energy exports from customers' DER (such as solar PV) to the grid

Non-System

Category	Sub-Category	Description
CAPEX – Fleet	Fleet	Replacement and refurbishment of heavy plant, replacement of Light Commercial Vehicles and ancillary assets.
CAPEX – Property	Property	Installation and refurbishment of buildings and other property assets
CAPEX - Information & Communication Technology (ICT)	ICT Recurrent	Investments to renew technology systems on < 5 year cycle, small projects and upgrades
	ICT Non-recurrent	Investments for new or large technology systems and renewals on > 5 year cycle

3.2. Capital expenditure objectives and criteria under the National Electricity Rules

Section 6.5.7 of the National Electricity Rules (NER) establishes capital expenditure objectives, criteria and factors, as outlined below.

3.2.1. Capital expenditure objectives

Under the NER, a Distribution Network Service Provider's (DNSP's) forecast capital expenditure must be required to:

- meet or manage expected demand for standard control services
- comply with all regulatory requirements and obligations
- maintain the reliability, quality and security of supply of standard control services; and the reliability, security and safety of the network.

3.2.2. Capital expenditure criteria

The AER must accept the DNSP's forecast capital expenditure if it is satisfied that it reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives
- the costs that a prudent operator would require to achieve the capital expenditure objectives
- a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

3.2.3. Capital expenditure factors

In assessing a DNSP's proposal against the capital expenditure criteria, the AER must have regard to:

- the most recent annual benchmarking report and the benchmark capital expenditure of an efficient DNSP
- the actual/expected capital expenditure of the DNSP during the preceding regulatory period
- customer views and concerns
- substitution options between operating expenditure and capital expenditure
- consistency with incentive schemes
- whether the forecast includes expenditure that should be part of a contingent project
- the extent to which the DNSP has considered efficient non-network options
- any relevant final project assessment report, and
- any other factor, as notified by the AER.

3.3. Approach to forecasting capital expenditure

In general terms, our approach to forecasting prudent and efficient capital expenditure for our 2024-29 Regulatory Proposal involves:

- assessing the need for expenditure and determining the most efficient way to meet that need
- testing and, if necessary, further refining these forecasts through 'top-down' analysis, external cross-checks and customer engagement.

3.3.1. Identifying the need for expenditure and developing expenditure forecasts

Our forecast capital expenditure will aim to maintain risks within tolerable levels, reduce costs, enhance or maintain services to customers over time and meet demand. We will focus on capital expenditure that most efficiently supports the continued provision of a safe, reliable, resilient and affordable energy network.

We identify the need for capital expenditure through our:

- Asset Class Strategies, which inform Replacement expenditure (Repex) decisions through assessment of factors such as asset age, likelihood of failure, risk and cost
- assessment of forecast demand and the need to augment the network
- assessment of other emerging trends, issues and opportunities, such as implications for our network of changes in the energy market, including the increasing importance of DER
- review of internal business systems and processes
- assessment of legislative and regulatory compliance requirements
- renewal or replacement of non-system assets, and
- consultation with customers and other stakeholders.

Consistent with the capital expenditure objectives in the NER, our need for capital expenditure relates to factors such as:

- maintaining service quality and reliability, given the age and condition of our assets and risk analysis
- connecting customers and augmenting the network, given connections, load growth forecasts and potential system constraints, including facilitating increased energy exports from customers' DER installations (i.e., meeting expected demand)
- enhancing value to customers, through delivering projects where benefits exceed costs or required outcomes are achieved at lower cost (i.e., achieving optimal efficiencies), and
- meeting legislative and regulatory requirements.

For recurring expenditure, such as 'volumetric' Repex, we use predictive models or trend analysis to estimate the likely required volume and timing of replacement for certain assets, drawing on data on asset age, failure histories and risk analysis. We can then apply unit rates (e.g., based on established internal rates) and multiply this by the forecast volume to derive an expenditure forecast.

For less regular expenditure (such as network upgrades, augmentation, or low volume/high cost repex), we conduct bottom-up specific, tailored analysis to confirm the need or justification for the project and its efficient costs. This includes consideration of all viable options to achieve the required outcome (including capital and non-capital options), and assessment of the optimal timing, scale and scope of the project.

Our forecast bottom-up Capex is then sense-checked using top-down checks (such as comparisons with 'Repex model' outputs). The result is subject to a risk-based prioritisation process with optimised outcomes, taking into account benefits realisation. This process is driven by our key investment objectives balanced with constraints such as deliverability and pricing impacts to help ensure we develop an affordable proposal in the long-term interests of customers. A detailed risk based investment procedure has been prepared to demonstrate multiple scenarios and outcomes of the optimisation process.

For new areas such as Resilience, we are undertaking climate impact assessments to assist with probability and consequence modelling in the future. In the interim, we have identified a range of resilience related projects that will be costed, valued and optimised following strong customer support for resilience projects.

Once we develop optimised capital forecasts for each system program area, these are then reviewed through an internal review and governance process – to ensure that capital expenditure is optimised at an aggregate level across the different systems.

For non-network recurrent ICT expenditure the overall forecast is informed by a high level trend analysis. Additionally, we have adopted an industry standard asset lifecycle management methodology to assess the useful life and replacement value of our client devices, infrastructure and data networking assets. Small and short life projects and renewals are generally assessed on a cost benefit basis and prioritised according to business need. For non-network non-recurrent ICT expenditure we forecast upcoming investments based on corporate and ICT strategic requirements and undertake full business case development, including cost benefit analysis. For major investments we seek customer and stakeholder feedback through relevant consultation forums and adjust investment proposals accordingly.

For non-network property capex, forecasts are prepared using robust asset health condition appraisals that identify property improvement requirements supported by prioritisation by asset criticality. The overall property capex investment plan is formalised following active stakeholder engagement.

For non-network fleet capex expenditure, the overall forecast is developed based on the asset lifecycle replacement strategy. For new fleet assets we use a robust analysis process which incorporates reliability, availability, maintainability, buildability and operability to identify fit for purpose additions.

Table 1 provides a high-level summary of our range of capital expenditure forecasting approaches, by expenditure type.

Table 1: Capital expenditure forecasting approaches, by expenditure type

Expenditure type	Forecasting approach
Replacement expenditure ('Repex')	Bottom-up (cost benefit) analysis for low volume/high cost assets Predictive models or trend analysis (based on asset condition, performance and risk/cost analysis) for volumetric, lower cost asset
Augmentation expenditure ('Augex')	Bottom-up assessment (cost benefit analysis), drawing on demand forecasts as relevant
Customer connection capex	Trend analysis, demand forecasts, benchmarking unit costs
DER	Bottom-up assessment and business case development (including cost benefit analysis) incorporating demand forecasts and technology options (as relevant).
Non-network capex	Generally trend analysis for recurrent and cost benefit analysis for non-recurrent

3.3.2. Top-down assessment and cross-checks

We will test and challenge our capital expenditure forecasts against 'top-down' analysis and external checks, including:

- trend analysis: for key areas of recurrent expenditure, we will assess our forecast capital expenditure against past expenditure to identify and explain any material changes in trend
- benchmarking: we will assess key metrics and performance outcomes against others in the industry, including relevant peer reviews for those new areas of expenditure (such as DER) which do not yet have clear industry benchmarks.

- AER Repex model: where feasible, we will assess our bottom up Repex forecasts against equivalent outputs from AER Repex models
- input validation and sensitivity testing: we will validate/check our key inputs against industry references and, where appropriate, test the sensitivity of forecasts to changes in key input parameters.
- customer views and preferences: we will refine our capital expenditure forecasts to deliver outcomes consistent with the wants and needs of customers, as identified through our consultation processes.

We will also compare our total forecast capital expenditure against actual expenditure over the current (2019-24) regulatory period, to identify, investigate and explain any material variation and relate this to key drivers – such as service levels, changes in demand or regulatory requirements and customer preferences, for example.

We would also explain the inclusion of any new capital expenditure categories in our forecasts – including why these are required, key drivers and how we have derived any category-specific cost forecasts.

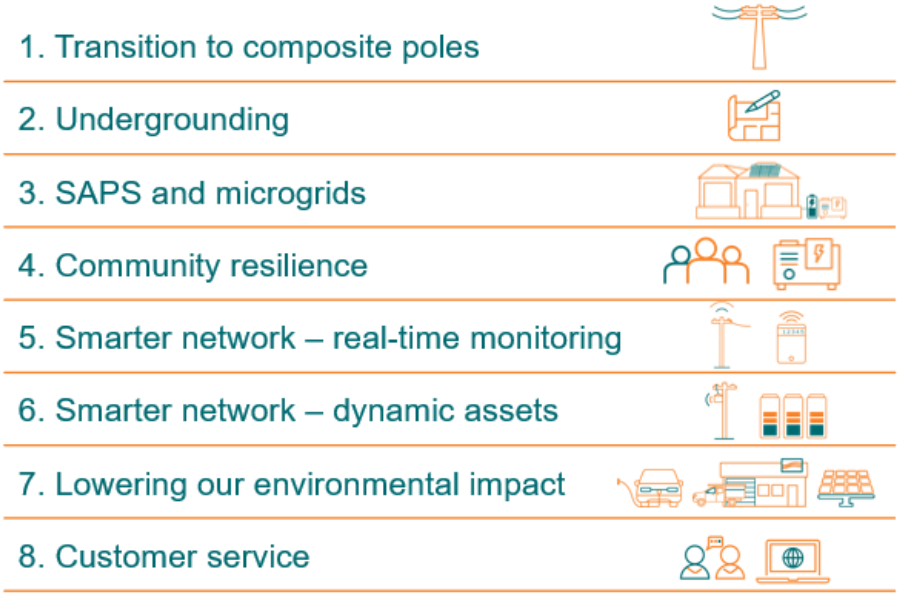
3.3.3. Customer engagement has informed capital expenditure forecasts

In section 2.3.2 we described how our engagement with customers is used to develop and refine our expenditure forecasts. Whilst there were elements of operating expenditure in most of the topics covered in our customer forums, capital expenditure plans were the most significant investments and therefore heavily discussed.

How our network improves its resilience to extreme weather events, and how we invest to ensure our network is fit for the future were key themes of our customer engagement. The transition to DER means that investments are needed to prevent power quality issues and to enable more renewable energy generation onto our network. Recent experiences of bushfires and floods across parts of the network and their impacts on electricity supply, has led to network resilience being very important for many of our customers.

We deliberated with customers for their views on the topics shown in Figure 7 - this helped us refine our expenditure plans.

Figure 7: Topics discussed with customers



4. Links between capital and operating expenditure forecasts

We develop our capital and operating expenditure forecasts to be consistent with each other, including ensuring that:

- any offsetting effects on future operating expenditure from the capital expenditure program are reflected in forecasts (and vice-versa)
- consistent inputs are reflected in both our capital and operating expenditure forecasts, such as expected network scale and real input cost changes
- costs are not duplicated in, or excluded entirely from, our capital and operating expenditure forecasts.