Investment portfolio decision making

Portfolio Management Office

6/12/22

Endeavour Energy

POWER together

Contents

Document Information

Content Coordinator	Investment Portfolio Manager
Process Category	Governance
Amendment No	V2.3
Approved By	Head of Portfolio Management Office
Approved Date	6/12/22
Review Date	6/12/23
Relevant Legislation	None
Relevant Standards/ Codes	ISO 31000:2018 Risk management – Guidelines ISO 55001:2014 Asset management – Management systems – Requirements
Related Policies	2.0.5 Group Board Policy Risk Management 2.6 Investment Management Framework 9.0 Asset Management
Related Documents	Investment Management Framework Value Framework Asset Management Framework Project Lifecycle Framework

1 Purpose

To provide guidance on our investment portfolio decision making methodology. The outcome of the methodology is an optimised delivery plan which delivers value through alignment to network objectives with consideration of internal and external constraints.

2 Scope

This document:

- applies to planned and reactive capital plans for Network, Property, and Fleet;
- applies to Totex plans for Technology; and
- does not apply to all other Opex and unregulated investments.

3 Context

Investment portfolio decision making is an important component in the development of capital delivery plans as part of the organisation's asset management framework (AMF), **Error! Reference source not found.**. Credible investments (usually Case for Investment's) identified through asset investment strategies are combined with existing inflight investments to feed into the decision-making methodology.

Investments must meet the requirements of the investment management framework (IMF) and use the organisation's value framework (VF) to quantify investment benefits and any costs. Investment portfolio decision making considers inputs (internal and external) and constraints to select investments that form the optimised delivery plan. Development and execution of individual projects and programs included in the optimised delivery plan are managed in accordance with the project management lifecycle framework. Figure 1 outlines the methodology in developing the optimised delivery plan. This document focuses on the investment portfolio decision making portion of the methodology.

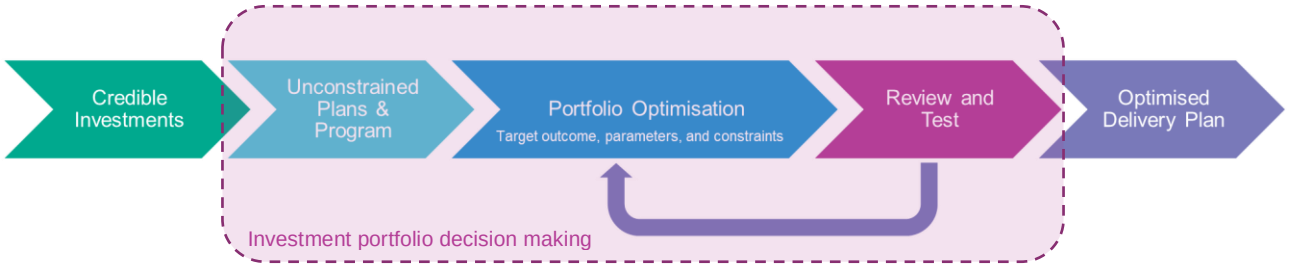


Figure 1: Development of our optimised delivery plan

4 Principles

In keeping with Endeavour's core value of "finding a better way" and focusing on addressing the long-term interests of our customers and community, we have identified four principles for investment portfolio decision making.

- **Value based decision-making**. Investments considered for inclusion in the delivery plan should have all costs and benefits quantified using the organisation's value framework.
- **Maximising value**. The methodology will aim to maximise customer value of the overall investment portfolio through selection and timing of individual investment projects and programs.
- **Line of Sight**. Investment portfolio outcomes should be aligned to network & organisational objectives.
- **Investment Trade-offs**. Investment portfolio decision making should consider trade-offs.

We aim to balance affordability for customers with investments that address the long-term interest of customers. Our approach is assessed and refined based on customer engagement and stakeholder feedback.

5 Methodology

5.1 Overview

This section describes the methodology of investment portfolio decision making (Figure 1) that is used to develop our optimised delivery plan. The key components of the methodology are outlined in Figure 2.

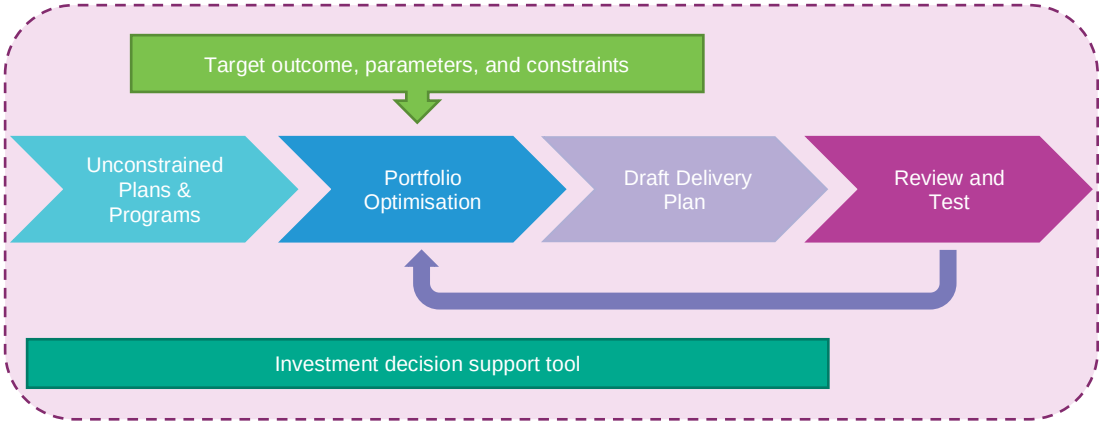


Figure 2: Investment portfolio decision making

A **draft delivery plan** is developed through optimisation of a portfolio of **unconstrained plans & programs**. **Portfolio optimisation** determines the selection and timing of individual investment projects and programs. The optimised portfolio is selected to achieve a target outcome using agreed parameters and adhering to defined constraints. **Target outcome, parameters and constraints** are developed in consideration of internal and external factors and network objectives including strategic organisational and asset management objectives.

The draft delivery plan is reviewed and tested through engagement of key stakeholders. The **review and test** stage is an iterative process in which feedback is reconsidered within the portfolio optimisation process until a final optimised delivery plan is developed.

The **investment decision support tool** (IDST) is software that manages the portfolio of plans and programs and undertakes the optimisation analysis required to develop the draft delivery plan. Each of the components of the process are expanded in more detail below.

5.2 Unconstrained plans and programs

The list of unconstrained plans and programs consists of investments that have been assessed to provide value using the organisation's value framework. Investments that are to be considered for inclusion in the optimised delivery plan should have techno-economic approval as per the investment management framework.

Investments may have multiple alternative options that have been assessed as providing value. As part of portfolio optimisation each alternative will be considered. The alternative which provides the greatest value within the context of the overall portfolio will be selected. Some alternatives may be dependent on which alternative has been selected in another investment.

The list of unconstrained plans and programs also include investments that are in various stages of delivery.

Groups of similar investments may be combined to form an investment program. Investment programs may be developed by grouping investments either prior to or after the optimisation process.

5.2.1 Investment treatment

Investments are assigned into an investment type and category, Figure 3. Each of these categories may be assessed in the investment portfolio decision making process individually or as a combined portfolio.

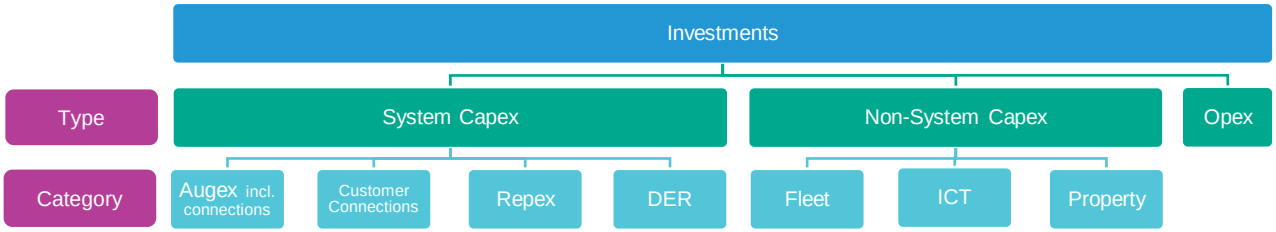


Figure 3: Investment types and categories

In addition to the categories in Figure 3, investments may be classified as either reactive or planned. The description of each of these classifications is provided in the breakout boxes below. Depending on the type, categorisation and classification, an investment may be treated differently when considered during the portfolio optimisation phase. A list of different investment types, categories and classifications and their treatment during portfolio optimisation is included in Appendix B: Summary - Investment forecasting methods and optimisation identification.

Reactive investments

Investment expenditure can be forecast over an extended period (usually probabilistically), but exact timing of individual investments is unknown. These investments may not be able to be shifted in time. Some examples of reactive investments are:

- functional asset failure;
- condition based replacement;
- major property repairs; and
- connections capex (mostly in the form of reimbursement to developers for a portion of gifted connection assets).

Planned investments

Projects that have been created to address an identified need or opportunity. Provided the network can continue to function without this investment, the investment timing can be deferred or brought forward during the optimisation process. Some examples of planned investments are:

- investments to address forecast load growth, excluding connections;
- investments to address increasing risks of asset failure;
- vehicle upgrades; and
- property purchases.

5.3 Portfolio optimisation

The objective of portfolio optimisation is to produce a draft delivery plan that maximises the total value of the overall investment portfolio. This is achieved through selection and timing of individual investment projects and programs. The optimised portfolio is developed using agreed investment assessment parameters and with consideration of a given set of constraints. This section describes the portfolio optimisation process.

5.3.1 Value calculation

Investment portfolio value is determined by considering the value provided by the individual investments within the portfolio. Costs and benefits are used to define investment value and these value measures are quantified using the organisation's value framework. Value measures may be financial costs and savings, or economic benefits such as risk, service metrics or resource requirements. Value is calculated using a pre-determined value function that quantifies in $ each of these value measures to enable the benefits and costs

associated with each investment to be compared. Some value measures may not be used in the value function to calculate value but may be used as constraints in the portfolio optimisation process or for reporting purposes.

Investments quantify the economic cost or benefit of each value measure over time. Value measures are quantified for the counterfactual, which assumes no investment is undertaken. They are also quantified for an outcome case, which assumes the investment has been completed. Value is then calculated by determining the net present value (NPV) of each investment relative to the counterfactual. The value calculated is economic value and includes financial costs as well as quantified risk mitigation, and other non-financial benefits. The NPV of each investment is calculated using the discounted cashflow method, where incremental cashflows are discounted back to the period in which the investment is valued. Investment assessment parameters are to be defined and used consistently in assessing the value of individual investments.

It is difficult to quantify value for certain investments, such as reactive programs. These programs may use historical trends to forecast the required investment level to be considered within the draft delivery plan. Appendix B: Summary - Investment forecasting methods and optimisation identification discusses the optimisation methodology used for different investment types and categories.

5.3.2 Investment assessment parameters

Investment value is calculated using defined investment assessment parameters. These parameters include financial and economic parameters as well as variables and rates used in the quantification of value.

Financial and economic parameters include:

- Annual inflation rates;
- Discount rate; and
- Investment evaluation period.

These parameters are determined and published periodically by Finance and the Regulation Team.

Variables and rates used in the quantification of value are defined in the value framework, they can include:

- Value of customer reliability (VCR);
- Value of statistical life (VoSL); and
- Safety disproportionate factor.

Defined investment assessment parameters allow for consistent evaluation of investments within the optimisation process.

5.3.3 Portfolio optimisation process

The portfolio optimisation process aims to adjust the timing of individual investments to maximise the value delivered by the overall portfolio. The portfolio to be considered for optimisation may include investments at various stages of the investment lifecycle. Some investments that are in the execution phase, and certain reactive programs, may have forecast expenditure that is fixed within a certain period. These investments will not be adjusted in time as part of the portfolio optimisation process.

Portfolio optimisation assesses the value of each investment, using the value function, by adjusting the timing of the investment by months or years. The optimisation process will select the timing of the investment that maximises the economic value of the investment. This process is conducted on all investments considered for optimisation to produce an optimised portfolio.

Constraints can be applied to the optimisation process to deliver an optimised portfolio that meets certain internal and external objectives. Optimisation of a portfolio will maximise the economic value of the overall portfolio over the whole assessment period while adhering to defined constraints. The optimisation process will adjust timing of investments to achieve this outcome. This may mean that the timing of each investment within the optimised portfolio may not align with the timing that provides maximum value for that individual investment.

5.3.4 Constraints

A constraint is a target or limit imposed on a value measure for a portfolio of investments over a period. Constraints can be used as part of the portfolio optimisation process to deliver an optimised portfolio that maximises value while meeting required internal and external outcomes. Multiple constraints can be applied as part of the optimisation process. Constraints can be applied over single or multiple years, or on individual investments. Both maximum and minimum constraints can be applied. Table 1 lists some examples of typical constraints that can be applied during the portfolio optimisation process.

Constraint	Description	Example
Value measure - cost	An expenditure limit for each period.	Ensure that expenditure does not exceed approved limits.
Value Measure – service metrics	A minimum constraint on a service metric.	Ensure the required level of service is met.
Value measure - risk	A maximum / minimum constraint on the total change in risk within a portfolio (bushfire, safety, reliability etc).	Ensure that the risk tolerance of the organisation is not exceeded.
Dependency	Defines the sequence between related investments (E.g., A then B)	Ensure that phased projects are completed in the correct order.
Compulsory	Investments that must be completed on a particular date.	Ensure “must do” projects, such as compliance, are completed on time.

Table 1: Example constraints applied during the portfolio optimisation process

Constraints are set in alignment with organisational strategic and asset management objectives, these include capital and operational considerations such as budget, resource, risk appetite and sustainability.

Use of constraints during the portfolio optimisation process allows development of a draft delivery plan that aligns with organisational strategic and asset management objectives.

Suitability of constraints are reassessed to incorporate customer and stakeholder feedback as part of the review and test of the draft delivery plan.

5.4 Draft delivery plan

The draft delivery plan is the output of the portfolio optimisation process. The plan consists of a list of investments and includes the proposed timing of expenditure for each investment.

The optimised delivery plan is required to cover a minimum time horizon of two years. The time horizon may be extended to a longer period of up to ten years as required.

The draft delivery plan is an ideal plan that maximises value within the defined period. The quality of the plan is subject to limitations in information available during the portfolio optimisation process. The draft delivery plan should undergo a process of review and testing before being proposed for execution. The draft delivery plan may be refined multiple times as part of the review and test process.

5.5 Review and test

Due to the complexities of portfolio optimisation, and the limitations in information available during the process, the draft delivery plan should be reviewed and tested before development of the final optimised delivery plan. As a minimum the plan should be reviewed for the following items.

- Alignment of portfolio outcomes to organisation strategic and asset management objectives.
- The ongoing risk position and alignment with the organisational risk appetite.
- Consideration of the Workforce Plan for practical deliverability, accounting for available resources and network access requirements.
- Duplication of investments (costs and benefits) within the plan.
- Delivery efficiencies through bundling or grouping of individual investments.

- Dependencies and relationships between investments that require post model adjustments.
- Alignment with agreed customer outcomes and commitments.

The plan outcomes should also be tested for sensitivity at the portfolio level to variations in the investment assessment parameters such as discount rate.

The review and test process should be undertaken in conjunction with various stakeholders internal and external to the organisation. A selection of stakeholder groups that should be involved in the process are listed below.

- Investment proponents who proposed individual investments included in the plan.
- Finance and Network Regulation.
- Design.
- Portfolio Management Office.
- Field Operations.
- Investment Management Committee.
- Our customers and other stakeholders.

The review and test process is an iterative process with cycles of portfolio optimisation, review and adjustment until an optimised delivery plan is developed.

5.6 Investment decision support tool

To ensure value-based decision-making is consistently applied, we have implemented an investment decision support tool (IDST). The IDST is a repository for investments from the idea (typically constraint identification) phase through to execution. Investment costs and benefits are quantified in the tool using models that are aligned with the organisation's value framework. Use of the tool provides consistency in application of the value framework, while providing transparency and reporting capability on the investment portfolio.

The IDST has an optimisation engine that maximises value through portfolio optimisation. Multiple constraints can be applied during portfolio optimisation to determine a draft delivery plan. These constraints can be enforced or relaxed to assist in convergence on an optimum portfolio. The ability to quickly test scenarios and compare outcomes drives meaningful engagement with internal and external stakeholders.

Portfolio optimisation in the IDST is only limited by the investment information provided within the tool. Continuous improvement in the functionality and information held in the IDST will continue to improve the quality of the portfolio optimisation and reduce the amount of iteration during the review and test process.

6 Continuous improvement

We are committed to continuous improvement and developing the maturity of our investment portfolio decision making. Improvement is targeted in two key areas.

- **Process**. Uplifting our processes to embed our investment portfolio decision-making principles across the asset lifecycle and capital delivery.
- **Technology**. Developing our technology to improve its functionality and reduce the human intervention required to make sound investment decisions.

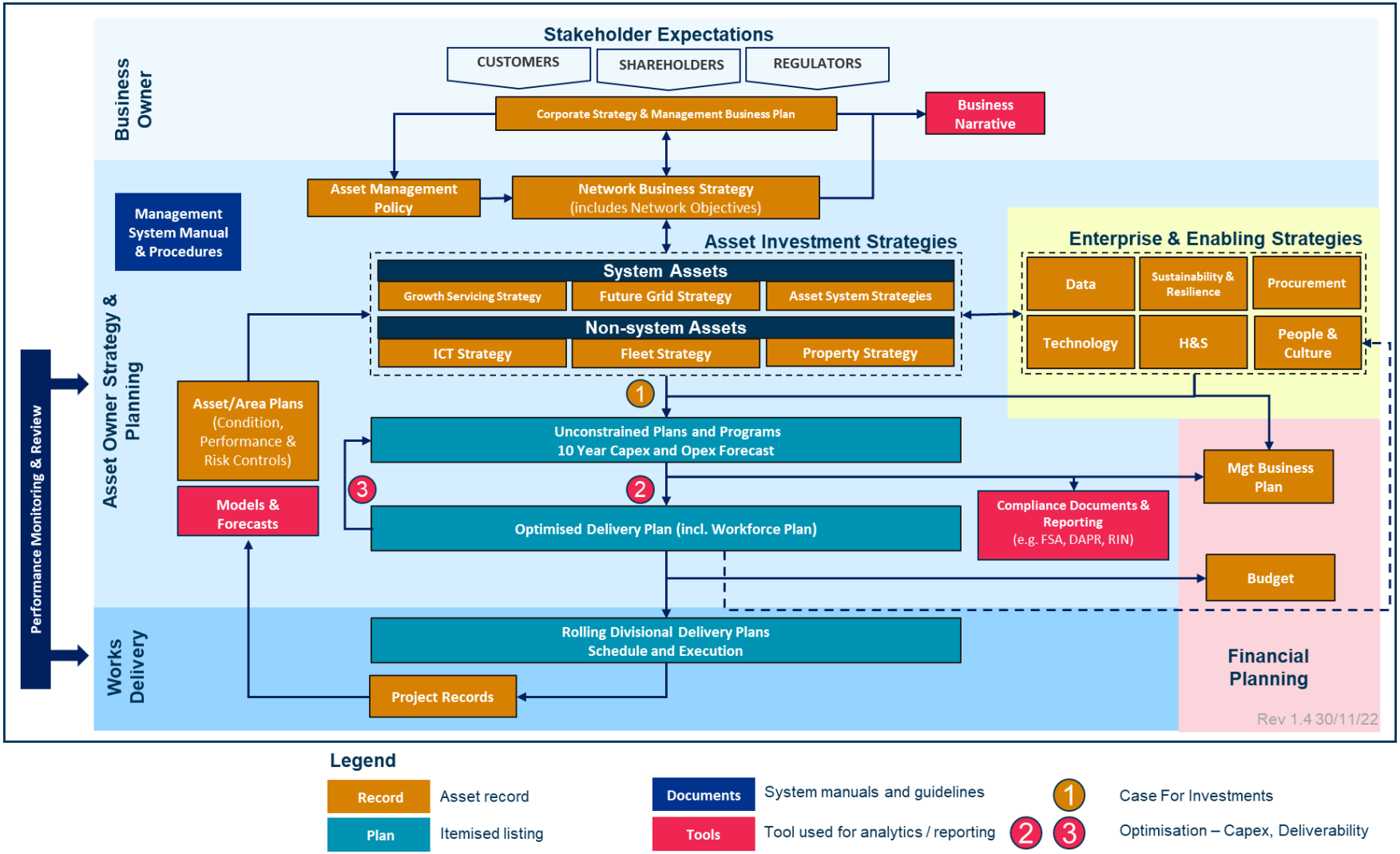
We use a Plan Do Check Act review cycle as part of assessing areas for improvement to include in our continuous improvement plan.

7 Portfolio governance

The optimised delivery plan is a snapshot, taken at a fixed time, of the portfolio of investments to be delivered within a defined period. Feedback on individual investments, including forecast updates, are continuously incorporated into an updated delivery view. Adjustments may require a review of the optimised delivery plan. Changes to the optimised delivery plan will be identified using the investment portfolio decision making process. Governance of the optimised delivery plan is outlined in the investment management framework. The investment management framework is supported by the project lifecycle framework and together they provide governance for the individual investments that form the optimised delivery plan.

8 Appendices

8.1 Appendix A: Asset Management Framework



8.2 Appendix B: Summary - Investment forecasting methods and optimisation identification

Investment Type	Category	Description	Forecasting Methodology Artefacts (pre-optimisation)	Portfolio Methodology
System	Augex	Planned investment increasing geographic reach and/or capacity of the network to address unserved energy risk arising from new customer connection and increasing demand in existing areas	• Connections forecasts • Summer Demand Forecast • Resilience Investment Method 3	Capex is optimised based on maximising value in alignment with Endeavour's network objectives.
	Customer Connections (Reactive)	Reactive investment partially reimbursing (approx. 15% of total cost) developers for provision of new distribution network required to connect customers in accordance with our Connections Policy.	• Connections Capex Model • Connections Case for Investment (CFI)	No optimisation.
	DER enablement	Planned investment addressing curtailed generation energy risk arising from connection (by our customers) of embedded generation	• DER Integration Business Case • Hosting Capacity Methodology (BoP)	Capex is optimised based on maximising value in alignment with Endeavour's network objectives.
	Resilience	Planned investment specifically targeted at improving the resilience of the network in response to climate driven events.	• Resilience Investment Method 3	Capex is optimised based on maximising value in alignment with Endeavour's network objectives and risk appetite.
	Repex (Reactive)	Reactive replacement of network assets due to functional failures or conditional failures.	• Asset Risk Methodology • Historical expenditure • Resilience Investment Method 3	No optimisation.
	Repex (Planned)	Planned replacement or refurbishment of network assets to maintain safety and reliability, comply with the National Electricity Rules (NER), and meet Endeavour's licence obligations	• Modelled – Asset Risk Methodology • Resilience Investment Method 3 • Unmodelled – CFI	Capex is optimised based on maximising value in alignment with Endeavour's network objectives and risk appetite
	Innovation	Planned investments in research or innovative technologies that have the potential to improve	• Resilience Investment Method 3 • Various CFI	No optimisation. Separate investment selection/governance process

		Endeavour's capital or operating efficiency or otherwise improve network service		
	Opex	Includes routine (asset inspections, preventive maintenance) and non-routine (reactive) maintenance, refurbishment projects	• Annual operating budget is derived from historical expenditure	No optimisation.
Non-system	Technology	Investments relating to IT systems, security, and software services	• ICT Strategy • Various CFI	Capex is optimised based on maximising value in alignment with Endeavour's network objectives and risk appetite
	Property (Reactive)	Fixed-on-fail repairs and refurbishment for building and facilities	• Property Strategy • Annual operating budget is derived from historical expenditure	No optimisation.
	Property (Planned)	Includes land purchase, facilities and building maintenance	• Property Strategy	No optimisation. Separate investment selection/governance process
	Fleet	Planned investments in new vehicles, plant, or equipment	• Fleet Strategy	No optimisation. Separate investment selection/governance process