

Attachment 12.1
Strategic Asset Management
Plan (SAMP) – CEOM8018
2019-24

April 2018



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1 Introduction

1.1 Purpose

This Strategic Asset Management Plan (SAMP) aligns the strategic direction of Essential Energy's Asset Management System (AMS) with the needs of our business and our stakeholders.

These stakeholders include: shareholders, customers, regulators, policy makers, industry groups, land owners, employees and the public.

The SAMP aims to ensure we meet corporate requirements by developing detailed Asset Management Objectives that incorporate stakeholder requirements. This approach ensures our asset management approach delivers the value all stakeholders expect.

The Plan meets the requirements of the ISO 55000 series of asset management standards and is part of a suite of documents that support Essential Energy's AMS. These ensure we distribute electricity in a way that meets our corporate objectives and stakeholder requirements, including present and future customers.

1.2 Scope

This SAMP covers Essential Energy's asset management and eTech (Network Communication only) divisions. It addresses how we manage both Essential Energy's portfolio of electrical network assets throughout their lifecycle and the information systems and processes we use to do that.

It does not cover our management of Essential Energy's non-network assets (e.g. property and fleet), which have their own asset management strategies and plans.

1.3 Planning Period and Review

This document covers a nominal planning period of 10 years and will be reviewed every year.

2 Asset Management System Framework

2.1 Overview

Essential Energy's AMS has been restructured to align with the ISO 55000 series of asset management standards. As well as improving our asset management processes, the restructure aligns with business implementations such as field force automation and our Asset Investment Planning System (AIPS).

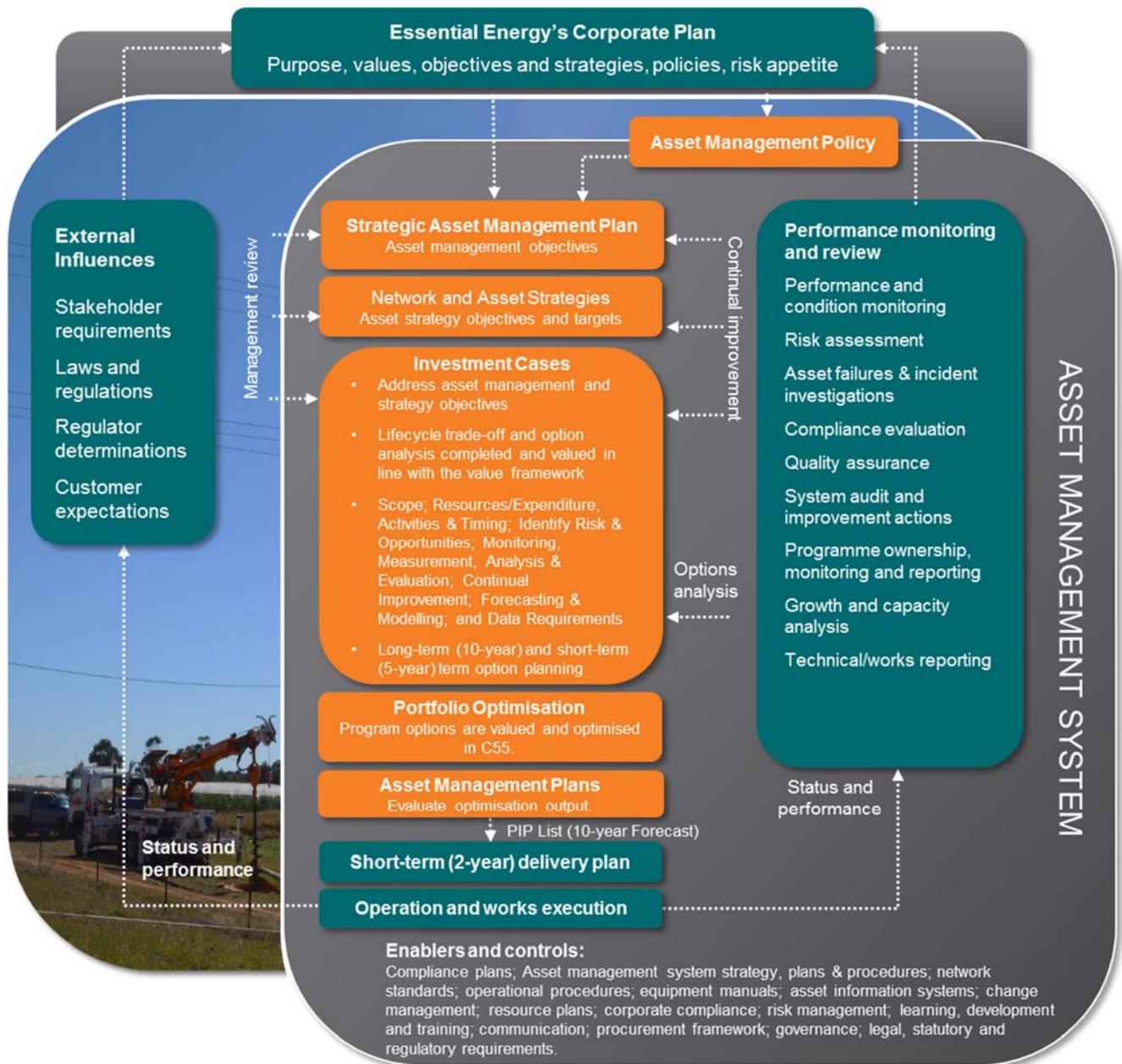
Our objectives for the AMS are:

- > Prudent, whole-of-life asset cost management
- > Alignment of strategic initiatives across the AMS
- > Increased employee engagement, including leadership, communications and cross-disciplinary teamwork
- > Alignment of processes, resources and functional contributions
- > Information-centric and data-driven decision-making
- > Consistent, prioritised and verifiable risk management
- > Improved asset management planning
- > Improved customer service
- > Maintaining overall network performance
- > Reduced stakeholder risk through implementing robust, demonstrable asset management governance processes.

2.2 High Level Framework

Essential Energy's AMS is shown in Figure 1. It follows the ISO 55001:2014 top-down approach of integrating corporate objectives into Asset Management Objectives, which then filter through the rest of the system. Through performance monitoring and review, we identify and implement continual improvement activities that improve our asset management practices.

Figure 1 – High Level Framework of Essential Energy's AMS



The core documents for our AMS are:

- > **Corporate Plan (Business Plan)**
Published annually and sets objectives for the entire business. Critical for establishing Asset Management Objectives.
- > **Asset Management Policy**
Guides how Essential Energy manages network assets to meet corporate objectives. Sets the asset management principles under which we operate.
- > **Strategic Asset Management Plan (SAMP)**
See Section 1.1.
- > **Network Strategies**
See Section 6.2.
- > **Investment Cases (ICs)**
See Section 6.3.
- > **Asset Management Plans (AMPs)**
See Section 6.5.
- > **Delivery Plans**
These have two components. The Portfolio Investment Plan (PIP) List is a high-level, 10-year outlook for expenditure requirements which is prepared by the Capital Works Program Manager. The rolling two-year statement of works, which is the interface between our Asset Management and Network Services functions, is prepared within Asset Management.
- > **Continuous Improvement Register**
The process for performance monitoring is tailored for each document. Our Continuous Improvement Register captures the identified improvement items in an online database, which is to be governed by a committee that risk assesses each item for risk then delegates actions. The Register is described further in Section 8.1.2.

3 Integration of AMS with other Business Systems

Table 1 – Integration of Asset Management System with other business systems

System	Policy and Procedures	Additional Information
Essential Energy's Electricity Network Safety Management System (ENSMS) Environmental Management System (EMS)	CEOM8047 - Electricity Network Safety Management System Plan Governed by standard — AS557 TotalSAFE safety incident database	
Corporate Risk Management System (CRMS)	CECP0002.03 - Board Policy (Governance) — Risk Management CEOP0002.21 - Company Procedure - Risk Management. CEOP2111.01 – Company Procedure - Asset Risk Management	

System	Policy and Procedures	Additional Information
Governance	CECP0002.30 - Investment Governance Framework CECP0001.02: Sub-Delegations of Authority by the Chief Executive Officer CEOP0002.82 Network Investment Governance	
Finance Management System	CECP0002.32 – Investment Evaluation Procedure Unit Rates	
Organisational Development and Human Resources	Position Description – available through Intranet CEOP2000.05 - Recruitment and Selection CEOP2000.53 – Apprenticeships. CECP2000.134 - Study Assistance Policy CEOP2000.135 - Study Assistance Procedure CEOH2000.114 - How to Submit a Request for Training CEOP2000.50 - Training and Development CEOP2000.54 - Induction Procedure CECG2000.90 - Graduate Engineer Program Essential Energy Intranet - Business Skills and Training Matrix Essential Energy Intranet - Network Skills and Training Matrix.	Initiated programs include: Commercially capable people Professional Engineering Development (PED) Plan to complete an Asset Management Capability Development and Resource Strategy
Business Management System (BMS)	CEOP4001.02 - Company Procedure - Policy and Procedure Framework (Business Management System): Preparation and Amendment of Documents Collection of templates on BMS	Housed on an online collaborative platform, SharePoint Documents undergo a major version update after an annual review, with minor version updates throughout the year.
IT	12.1.16 Information Management Business Plan	During the 2019-24 regulatory period, Essential Energy will leverage ICT as the primary enabler for business transformation. The efficiencies underpinned by our ICT strategy directly link with the service affordability that our customers value. This strategy involves adopting modern alternatives to traditional, longer-term ICT capital investments and rationalising existing legacy applications and infrastructure.
Fleet	12.1.17 Fleet Business Plan	Most of our network programs are carried out using heavy and light commercial vehicles, so managing our fleet assets efficiently is vital and the impact of fleet reliability on work program efficiency is part of our fleet asset management strategy
Property	12.1.18 Property Business Plan	Essential Energy manages 111 properties across an area covering 95 per cent of NSW. We decide the number and location of our depots by balancing site costs (e.g. property, furniture, fittings, leases) with the costs of mobilising resources for planned and reactive network programs.

4 AMS Considerations

4.1 Stakeholder Requirements

Essential Energy has many stakeholders so we need an AMS that addresses all their requirements. Stakeholder engagement plays a critical role in developing our Corporate Plan so it is also important for managing the AMS.

4.1.1 Board and Executives

Our Board, CEO and executives set the direction for Essential Energy and are ultimately responsible for business performance. Their corporate objectives are clearly identified in the annual Corporate Plan and form the basis of our Asset Management Objectives. The link between corporate and Asset Management objectives is outlined in Section 6.1.

4.1.2 Shareholders

Essential Energy is a State Owned Corporation (SOC), so our only shareholder is the NSW Government, which represents the people of NSW. Just like a private shareholder, the NSW Government requires a return for its investment. The Board, CEO and executives specify this return in the Corporate Plan.

4.1.3 Customers

As a utility, Essential Energy must be customer-focused. To ensure we make customers central to everything we do, we have a customer service team, which has a strong interface with the AMS. The team provides community insight through several avenues, including engagement surveys and meetings with customer advisory groups.

One of our customers' greatest concerns is increased electricity prices. This sentiment has been identified by the Board, CEO and Executives and is addressed in the Corporate Plan.

4.1.4 Regulators

As a monopoly business, Essential Energy is regulated in a way that simulates a competitive market. Two key regulators impact the AMS: the Australian Energy Regulator (AER), which utilises the National Electricity Rules; and the Independent Pricing and Regulatory Tribunal (IPART), which evaluates our performance against the requirements of the Work Health and Safety Act 2011 and the Electricity Supply (Safety and Network Management) Regulation 2014.

We have built the requirements of both regulators into our business as usual practice so we can work towards operating to best practice and maximum efficiency.

4.2 Internal and External Factors

The network landscape is undergoing significant change including evolving technology and changing stakeholder requirements. In line with our customers' expectations of having cost-effective systems and processes that deliver maximum value, we have invested significantly in technology and propose to continue doing so during the 2019-24 regulatory period as part of our ongoing business transformation

We will also continue to explore alternative solutions for our most remote customers and undertake pilots and trials of non-network solutions. We are doing this to identify more cost-effective options where these continue to deliver existing consumer protection obligations and reliability standards. Our pilots and trials will align as closely as possible to the Electricity Network Transformation Roadmap

4.2.1 Customer-Side Technology (External)

Traditional distribution networks are facing significant and accelerated change including the increasing adoption of customer-side technology changes to demand, energy consumption, power flow, power quality and asset performance.

The trends that will affect future network use include:

- > Increase in energy-efficiency equipment

- > Introduction of load control devices for home appliances
- > Adoption of alternative energy supply options or distributed generation (solar PV, micro-wind)
- > Energy storage
- > Electric vehicles
- > Sophisticated, internet-enabled digital equipment that further enables home automation and optimises electricity usage
- > Growth in distributed generation (on-site generation), where small-scale residential customers and solar and wind farms connect directly to Essential Energy's network.

These will lead to changes to customer behaviour, which will be driven by the perceived benefits of new and emerging energy technologies. These include: the availability and cost of the technology versus its ability to reduce electricity bills; incentives from technology manufacturers and retailers; integration with transportation (e.g. electric vehicles); and reduced environmental impact.

We expect the internet to continue enabling and delivering new services, resulting in more sophisticated energy management systems, aggregated services and the development of new markets, which will provide both challenges and opportunities for the network.

4.2.2 Network Technology (Internal)

Where cost effective to do so, we continue to modernise our network to keep pace with its evolving operating environment.

The dynamic nature of network power flow, particularly on the low and distribution voltage network, requires more complex and intelligent control systems so we can meet customer service outcomes and our service quality obligations and provide a safe network. Modernising the network will also help address other issues in our operating environment, such as operational efficiency, customer-side technology adoption and asset lifecycle management.

Our network modernisation plans include:

- > Power quality monitoring
- > Smart metering (controlled by retailers)
- > Dynamic power compensation devices
- > Communications-enabled remote monitoring
- > Protection devices.

The integration of these systems will provide us with the capability to support and manage:

- > Customer-side technology adoption
- > The systems' impact on network performance
- > Our ability to meet service quality obligations
- > Greater customer choice by providing pricing, quality, and reliability options
- > Greater operational efficiency
- > Efficient management of asset lifecycles
- > Maintenance of equipment within operational specifications
- > Minimisation of environmental impacts.

We need to ensure we manage the pace and focus of our future network development activities in a way that maximises the benefits to our customers and the community.

4.2.3 Business Technology (Internal)

Along with advancements in network technology, we are seeing developments in business technologies and software. Essential Energy is focusing on how these can radically improve our efficiency, auditability and risk management. For more details, see Section 7.2.1.

4.2.4 Ageing Asset Base (Internal)

Essential Energy's ageing asset base provides us with some monitoring and maintenance challenges. Many of our assets were constructed between 1960 and 1990 and are forecast for replacement over the next few regulatory control periods (ten-plus years). In addition, during the 2004–2010 investment period, we introduced more modern assets that typically have shorter lifecycles than traditional primary equipment (e.g. electronic protection relays). Many of these modern assets are becoming obsolete and will require replacement during the same period.

To address these challenges, Essential Energy will continue to develop and evaluate options that optimise lifecycle cost and sustain a level of performance that aligns with our corporate objectives.

4.2.5 Asset Information Quality (Internal)

A greater focus on asset management requires a greater reliance on asset data. Due to the amalgamation of smaller networks over the last 20 years, and with no requirement to utilise data when building the network, our existing asset data needs improvement.

Also, as technology advances, big data analytics is becoming more prominent, which further increases asset management's data requirements. The ability to process large amounts of data and turn it into actionable information will help us with risk-based investment and predictive asset condition-monitoring.

These changes will require cultural transformation supported by new business technology, controlled processes and a clear, comprehensive transition program from the old AMS to the newly-revised version.

4.3 Asset Management Policy

The Asset Management Policy (CECP1004) is an executive-approved document which details the high-level requirements for Essential Energy's asset management practice. It guides the structure and requirements of the AMS for monitoring and maintaining Essential Energy's ageing asset base and its objectives inform the Asset Management Objectives outlined in Table 1.

5 Asset Management Culture and Leadership

Essential Energy creates an asset management culture through communication and training. Communicating regular and consistent messages about asset management practice and systems, and how employees can play their part, is critical and is supported by an Asset Management Communications Plan that includes:

- > Briefing bulletins
- > Presentations
- > Visual stimuli in offices
- > An increased executive focus on asset management
- > Asset management training
- > Back to Basics program that involves regularly sending office staff into the field.

6 Asset Management System Output

6.1 Asset Management Objectives

The Asset Management Objectives (Table 1) are developed and maintained by our Strategic Asset Management Committee (SAMC). They align with the objectives in the Asset Management Policy and Corporate Plan, are developed using SMART principles and form the basis of our annual Asset Management Objectives.

We anticipate that with each iteration of the Asset Management Objectives, the yearly objectives will evolve from lagging to leading indicators. We also expect further improvements as organisation-wide understanding of the AMS grows (see Section 5) and data quality improves. Furthermore, we intend to analyse each objective in greater detail in the relevant network strategies to set targets for network subsystems and their respective asset classes.

Table 2 – Asset Management Objectives

Asset Management Objective	AM Objective Measure for 18/19	Dependent Strategy	Corporate Objective Alignment	Asset Management Policy Alignment
Asset investment programs are optimally targeted to ensure risk aligns with the Corporate Risk Tolerance	> All programs have been valued and optimised by using a consistent, approved Value Framework (Y/N)	SAMP	<ul style="list-style-type: none"> > Deliver a satisfactory Return on Capital Employed. > Operate at industry best practice for efficiency, delivering best value for customers. > Place downward pressure on customers' distribution network charges. > Continuous improvements in safety culture and performance. 	<ul style="list-style-type: none"> > We will ensure our activities align with our Corporate Plan and Objectives. > Our asset management approach will align with the risk and criticality of the assets and asset system, achieving a safe, reliable and sustainable network. > Our focus will be on the service outcomes seen by customers and we will place them at the centre of everything we do.
Meet the Network Reliability Performance targets as set by the business objectives	> Targets met as per business objective – SAIDI and SAIFI (Y/N)	Reliability	<ul style="list-style-type: none"> > Continuous improvements in safety culture and performance. > Operate at industry best practice for efficiency, delivering best value for customers. 	<ul style="list-style-type: none"> > We will ensure our activities align with our Corporate Plan and Objectives. > Our focus will be on the service outcomes seen by customers and we will place them at the centre of everything we do.
Customers receive a quality of service that is in line with community expectations	> Reflection of the customer engagement (Stakeholder Requirements) is considered in Network Strategies (Y/N)	Safety and Environment Reliability Power Quality Growth SAMP	<ul style="list-style-type: none"> > Continuous improvements in safety culture and performance. > Operate at industry best practice for efficiency, delivering best value for customers. 	<ul style="list-style-type: none"> > Our focus will be on the service outcomes seen by customers and we will place them at the centre of everything we do.
Manage our assets so investment decisions result in sustainable, cost-effective asset performance outcomes for the present and the future	<ul style="list-style-type: none"> > All strategies include forecasting on target changes (Y/N) > Plans consider forecasted targets with Asset Management Investment options to minimise step-change in future programs (Y/N) > Monitoring plans created for programs (must check delivered units and unit rates) (Y/N) > Under-delivery is risk-assessed where required (Y/N) > 2-year rolling plan delivered (Y/N) 	Safety and Environment Reliability Power Quality Growth SAMP	<ul style="list-style-type: none"> > Deliver a satisfactory Return on Capital Employed. > Place downward pressure on customers' distribution network charges. 	<ul style="list-style-type: none"> > Assets will be managed to achieve the most prudent balance between performance, costs and risks over their lifecycle. > Our asset management approach will align with the risk and criticality of the assets and asset system, achieving a safe, reliable and sustainable network. > We will embrace sustaining and disruptive technological developments to ensure the long- and short-term sustainability of our network. > Asset management will be embedded into standard business practice across Essential Energy.
Comply with applicable statutory and regulatory obligations or requirements for asset management	<ul style="list-style-type: none"> > Compliance obligations identified in strategies (Y/N) > Gap analysis completed in strategies (Y/N) > Targets set in strategies to give guidance to Asset Management Plans (Y/N) 	Safety and Environment Reliability Power Quality Growth	<ul style="list-style-type: none"> > Operate at industry best practice for efficiency, delivering best value for customers. 	<ul style="list-style-type: none"> > All asset management activity will comply with relevant legislative and statutory requirements.
Develop, manage and continually improve our Asset Management System in line with best practice as identified by ISO 55001 and/or recognised bodies	<ul style="list-style-type: none"> > Investment Cases follow Investment Governance Procedures (Y/N) > Unit rates published annually (Y/N) > Unit rates benchmarked (Y/N) > Unit rate discrepancies result in improvement action that is stored in Continuous Improvement Register (Y/N) 	SAMP	<ul style="list-style-type: none"> > Operate at industry best practice for efficiency, delivering best value for customers. > Continuous improvements in safety culture and performance. 	<ul style="list-style-type: none"> > Asset management will be embedded into standard business practice across Essential Energy. > Our asset management approach will align with the risk and criticality of the assets and asset system, achieving a safe, reliable and sustainable network. > We will ensure we have appropriate skilled resources available to define the present and future requirements of our customers, assets and network. > We will embrace sustaining and disruptive technological developments to ensure the long- and short-term sustainability of our network. > We will proactively seek continual improvement opportunities to assure value for money for customers and stakeholders, and to move to best-practice asset management.
	<ul style="list-style-type: none"> > AM critical processes identified (Y/N) > AM critical processes mapped (Y/N) > Shortlist of AM critical processes identified for efficiency improvement completed (Y/N) 			

Asset Management Objective	AM Objective Measure for 18/19	Dependent Strategy	Corporate Objective Alignment	Asset Management Policy Alignment
	<ul style="list-style-type: none"> > Roadmap developed and implementation commenced (Y/N) > AMS Framework defined (Y/N) > Capability Development Strategy developed (Y/N) > Capability Development Strategy requirements initiated in 2016 (Y/N) > Document templates constructed with sections for risk modelling, lifecycle planning, line-of-sight, data and Continuous Improvement Plans (Y/N) > Communications Plan constructed (Y/N) > Communications Plan requirements initiated in 2016 with ongoing actions (Y/N) > AMS Performance Reporting and Audit Procedures created (Y/N) > Business unit interface requirements specified (Y/N) > Business unit interface documents created in FY18 (Y/N) > PIP Management Framework established (Y/N) > PIP Management Framework defines role of PIP owner, scope of work, responsibility and authority (Y/N) > Change Control Process established (Y/N) 			

6.2 Network Strategies

Essential Energy's Network Strategies expand on our Asset Management Objectives by applying a network focus. Each Network Strategy is assigned Asset Management Objectives to satisfy at a network level through relevant programs.

Our Network Strategies also perform a gap analysis function, identifying any emerging issues outside routine asset lifecycle practices. The resulting issues are addressed in our Investment Cases. The strategies also support network performance through their performance monitoring plans. Most importantly, they identify relevant laws and regulations and set targets to comply.

All Network Strategies align with Essential Energy's corporate values and drivers, including those that drive the AMS:

- > Safety and environment (supporting document 12.1.5)
- > Power quality (supporting document 12.1.6)
- > Reliability (supporting document 12.1.7)
- > Growth (supporting document 12.1.8)
- > Demand management (supporting document 12.1.9).

6.3 Investment Cases

Our Investment Cases focus on asset classes and programs of work. They aim to achieve the Asset Management Objectives identified by the SAMP and Network Strategies while being true to the Asset Management Policy.

In each Investment Case, we analyse asset performance and condition before proposing multiple options for managing the asset class. These options are valued according to Essential Energy's Value Framework, which includes costing and risk assessment. We then enter them into our Asset Investment Planning System so a final network portfolio can be established.

6.4 Optimised Portfolio

The Investment Case programs and their options are valued using Copperleaf's Investment Decision Optimisation solution, C55. The values align with Essential Energy's Value Framework.

C55 is designed to optimise a works portfolio based on the value and cost of each program. The aim is a portfolio that delivers the greatest risk mitigation per dollar spent and benefits for the entire network, as opposed to the best decision for an isolated asset class. The program involves applying financial, resourcing and other constraints, which can be varied so our executives and Board members are able to determine the direction of our capital investment portfolio. The final portfolio is collated as the PIP list and we compile an associated two-year rolling plan of projects.

6.5 Asset Management Plans

The AMPs summarise the applicable Asset Management Objectives and provide a succinct summary of each subsystem's economic health and proposed expenditure programs over its lifecycle. The AMPs and their respective subsystems are:

- > Zone Substation Assets (supporting document 12.1.10)
- > Underground Network Assets (supporting document 12.1.11)
- > Secondary System Assets (supporting document 12.1.12)
- > Overhead Network Assets (supporting document 12.1.13)
- > Network Metering Assets (supporting document 17.1.1)
- > Public Lighting Assets (supporting document 17.4.1).

7 Performance Requirements and Gap Analysis

This section discusses the performance of Essential Energy's network against the Asset Management Objectives set out in Section 6.1 and highlights the causes of any performance gaps.

7.1 Corporate Risk Tolerance

Asset Management Objective: Asset investment programs are optimally targeted to ensure risk aligns with the Corporate Risk Tolerance.

For Asset Management decisions within Essential Energy, Asset Risk Management (CEOP2111.01) is utilised to risk assess the likelihood and consequence of assets and related programs. This procedure sits under our Risk Management Policy (CECP0002.03) and aligns with our Appraisal Value Framework in order to achieve alignment to our Corporate Risk Tolerance.

7.2 AMS Projects

Asset Management Objective: Develop, manage and continually improve an Asset Management System in line with best practice, as identified by ISO 55001 and/or recognised bodies.

This section details projects that have been achieved, are underway or will commence in the previous and future regulatory periods in order to move Essential Energy's Asset Management System towards best practice.

Further alignment with this objective is covered in Sections 8 to 11.

7.2.1 Technology-Based

Table 3 – Technology based best practice projects

Project	Description and Benefit	Status
Drone use for inspection	<p>Drones have been purchased by Essential for our asset inspectors to use. They have achieved more thorough condition assessment of conductors and pole-tops for minimal cost (as the inspector is already there).</p> <p>The devices' applications have been extended to include detailed analysis of critical assets, fire incident investigations and network disaster analysis/identification.</p> <p>This process should result in lower fault and emergency costs.</p>	In Progress (more drones to be introduced)
LIDAR data models for vegetation control and cross-arm condition deterioration models	<p>Essential Energy's LIDAR program initially focused on identifying defects, such as low spans, vegetation encroachment and defective pole-tops. However, the ability to create a snapshot of the network at a point in time has leant itself to building growth and deterioration models. The models will help predict future issues such as vegetation encroachments, cross-arm deterioration, detailed network safety calculations, pole leaning, pole stay effectiveness etc.</p> <p>We are still uncovering additional uses for LIDAR. Street views of line routes are likely, using real-time satellite LIDAR enablers. The results will reduce the time spent on faults and emergencies and enable us to better target expenditure associated with our businesses risk appetite.</p>	In Progress (models under construction)

Project	Description and Benefit	Status
Acoustic monitoring for partial discharge	<p>Partial discharge causes the emission of high frequency noises. These can be detected by acoustic monitoring devices and are a leading indicator for serious technical issues.</p> <p>We have completed two programs of work regarding partial discharge detectors. The first stage was the rollout of independent devices for the zone substation group and the second stage was the iPhone peripherals rollout for field staff.</p> <p>This process should result in lower fault and emergency costs for underground switchgear and zone substation equipment.</p>	Completed
Multi-layered spatial analytics and modelling	<p>To improve our risk-based decision-making, the consequence of each asset failure needs to be determined at an individual level. Huge advances in spatial analytics combined with the data obtained from LIDAR will change the way we operate in the business. To support this, we need to implement new data capture and storage devices.</p> <p>This process should result in a lower CAPEX spend while maintaining or improving overall risk. It will also reduce fault and emergency costs for modelled assets and aid in the management of SAIDI performance.</p>	To be Initiated
Field Force Automation	<p>Field force automation is a key tool for improving data acquisition and resource planning.</p> <p>This technology should lead to lower CAPEX and OPEX unit rates and more accurate data on which to base strategic decisions, which in turn should lower long-term CAPEX and OPEX expenditure.</p>	In Progress
Asset Investment Planning System	<p>Our Asset Investment Planning System allows us to optimise the investment portfolio based on our corporate objectives. It is the key tool for moving to a risk-based expenditure model and is underpinned by our corporate Value Framework.</p> <p>This system will maintain or reduce our network risk by reducing or maintaining the previous expenditure profiles.</p>	Completed
Probabilistic Planning Tools	<p>We used a standard probabilistic tool for tree events to predict the likely outcomes of asset class failures. We used the outputs for our Investment Cases and Asset Investment Planning System.</p>	Completed
Asset Information Management System	<p>To support risk-based decision-making and resource planning, we require a supported and integrated Asset Information Management System. This will house data that is integrated with self-serve software and other systems, such as resource planning systems.</p> <p>This system should lead to a lower longer-term OPEX spend as it will improve productivity, lower data acquisition time and support other technological initiatives through integration with other systems.</p>	In Progress
Enterprise Resource Planning System	<p>This system will support agile resource planning for field staff by dynamically adding more activities into their day to account for early finish times. This means more work for the same resource hours. Furthermore, it may be possible to reallocate staff numbers by automating the timesheet process.</p> <p>This system should lead to a lower longer-term OPEX spend by improving productivity and changing the timesheet process, and it should reduce CAPEX and OPEX unit rates.</p>	In Progress

Project	Description and Benefit	Status
LIDAR Defect Identification	<p>Essential Energy's LIDAR program has captured many defects that were previously unidentified by traditional inspection programs. This has improved our understanding of network risk.</p> <p>This should lead to a lower fault and emergency spend and reduce the chance of a high-consequence incident because we can prioritise defects with this data.</p>	Completed

7.2.2 Process-Based

As part of the AMS, new processes and procedural changes have been occurring, to the benefit of the business, and this will continue.

Table 4 – Process based best practice projects

Project	Description and Benefit	Status
Simplify AMP structure to provide agility	<p>The AMPs were initially large documents that required a team of people to keep them regularly updated. Now they are completed in a PowerPoint template, our ability to update them and communicate them to key stakeholders has significantly improved.</p> <p>This process improvement has led to a reduction in employee OPEX hours of approximately 10 people for 60 hours per year.</p>	Completed
Digitise and automate documents	<p>The ability to digitise and automate documents will ensure the latest documents and data are always available for external uses and will reduce the hours required to update and approve documents. The introduction of Spotfire data links (described further down in this table) paves the way for algorithmic approval processes for these documents.</p> <p>This process will lead to a reduction in employee OPEX hours.</p>	To be Initiated
Value reports	<p>Time spent on individual reports will be captured so we can understand the financial implications of requesting certain reports. This will encourage a reduction in reports and self-serve data retrieval.</p> <p>This process will lead to a reduction in employee OPEX hours.</p>	In Progress
Self-serve data retrieval	<p>We have implemented Spotfire, a visualisation tool, and data links to a variety of databases are presently underway. This has allowed employees to retrieve their own and up-to-date data.</p> <p>This process has led to a reduction in employee OPEX hours.</p>	In Progress (More links being added)
Commercial capability	<p>Commercial capability is a corporate initiative to educate staff to become commercial in everything Essential Energy does. It involves raising awareness that Essential Energy operates in a commercial and market environment so every decision should have a positive influence on customers and stakeholders.</p> <p>This initiative will reduce OPEX and CAPEX expenditure in many sections of the company.</p>	In Progress

Project	Description and Benefit	Status
Asset Management System development and implementation	The AMS has been redeveloped to ISO 55001:2014 international standards to ensure it is best practice. It has been refocused to deliver more optimal output and been realigned with recent corporate objectives. This has led to many new initiatives, including all those mentioned in this document.	Completed
Increased use of leading indicators	Essential Energy has previously relied on many lagging indicators.. We will move to increasing the use of leading indicators that allow actions to be put in place before incidents occur. This initiative should affect performance across the network, including reliability and safety.	To be Initiated
Asset Management Capability Development and Resource Strategy document	A key AMS document will be the Asset Management Capability Development and Resource Strategy. This will help define the interface between Organisational Development and Human Resources and will cover areas such as staff training and development, succession planning and resource capability requirements.	To be Initiated
Quality Assurance testing	Essential Energy has implemented a Quality Assurance laboratory where old and new assets and tools are tested to ensure they meet specifications and to understand the various failure modes and condition of our assets. The lab has been established in Port Macquarie and is continually growing so we can increase our testing capability.	Completed

8 Performance Monitoring and Continual Improvement

8.1 Asset Management System

8.1.1 Performance Monitoring

Every AMS document has its own performance monitoring process and checklist. These are built into the templates for our Network Strategies and Investment Cases. This ensures each document is audited and maintained in its own unique way.

Consistent monitoring activities include:

- > Logging output from audits through the Continuous Improvement Register
- > Reviewing targets at least once a year
- > Reviewing critical data (as determined through sensitivity analysis) at least once a year
- > Auditing a percentage of programs or projects that directly relate to each document for validity and alignment at least annually.

Auditing the AMS will be completed under the SAMP Performance Monitoring Plan.

8.1.2 Continuous Improvement Register

The Continuous Improvement Register is an online database that is accessible to all asset management employees.

The Register allows improvement items and non-conformances to be logged for personal information or wider business action. It also acts as the AMS Risk Register.

An AMS Continuous Improvement Committee will be established and review submitted action items each month for risk, benefit and urgency. A Committee member will become the improvement owner and delegate an action owner to complete the task or implement the corrective action. The Committee will audit its performance every month against benchmarked completion dates.

8.2 SAMP Performance Monitoring

The SAMP and the Asset Management Objectives are the responsibility of the SAMC. The performance of the Plan and Objectives is measured against the achievement of the corporate objectives. The SAMC meets quarterly to review the AMS and is responsible for annual updating.

Table 5 – SAMP Performance Monitoring Requirements

Initiative	Recurrence	Owner	Measure of Success
Output from audits are logged on the Continuous Improvement Register	As required	Engineer Network Investment	>0 continuous improvement items logged relating to SAMP
Check if annual asset management targets achieved	Annual	Engineer Network Investment	Targets as per Asset Management Objectives
External audit of AMS to ISO 55001:2014/Asset Management Maturity check	Three years	SAMC	Audit completed and asset management maturity has improved (Y/N)
Review of SAMP completeness	Annual	Engineer Network Investment	Survey Asset Management employees to determine whether they require further guidance from the SAMP. Target is to answer all questions.
Ensure Asset Management Objectives are current and achieve business objectives	Annual or as required	SAMC	Business objectives relating to asset management achieved (Y/N) Asset Management Objectives revised within 3 months of changing business objectives (Y/N)
Long term Strategic Improvement Plan for AMS completed and updated	Annual	SAMC	AMS Strategic Improvement Plan exists (Y/N) Targets met as per Improvement Plan (Y/N)
Communications Plan completed and updated	Annual	SAMC	AMS Communications Plan exists (Y/N) Targets met as per Communications Plan (Y/N)

9 Accountabilities

9.1 AMS and SAMP

The Strategic Asset Management Committee (SAMC) is responsible for the AMS and the SAMP. They must ensure the AMS is:

- > Driving the appropriate asset management outcomes to achieve corporate objectives

- > Aligned to ISO 55001:2014
- > Appropriately resourced
- > Continually improved
- Periodically audited against ISO 55001.

9.2 Network Strategies, AMPs and Investment Cases

Network Strategy, AMP and Investment Case owners must ensure that:

- > They explore and document multiple options for expenditure through a balance of cost, risk and performance
- > Asset performance is continuously monitored to ensure it will achieve Asset Management Objectives
- > Programs of work meet Key Performance Indicators, as specified in the Network Strategies or SAMP
- > Performance Monitoring Plans are adhered to.

9.3 Other Responsibilities

Our Network Delivery team is responsible for delivery, resourcing and work execution documents and the AMS team is part of the approval process.

Responsibilities for enabling, communications and control documents are recorded in the BMS and follow our corporate change control process. The documents are recorded in the AMS Description Manual.

10 Document Control

All AMS-related documents are reviewed annually and made internally available through Essential Energy's intranet or SharePoint sites.

11 SAMP Requirements Summary

Table 6 – SAMP Requirements Summary

Document/Process	Requirement
CECP0002.32	Is responsible for AMS risk requirements and prioritisation and optimisation of programs and projects (Section 9.3).
All AMS documents	Follows corporate processes for governance and finance while integrating with the BMS Contain performance monitoring (Section 8.1.1).
Unit rates	A document and process around unit rates is completed and maintained
Asset Management Capability Development and Resource Strategy	Is developed in conjunction with Organisational Development and Human Resources.
Communications	All significant changes within Asset Management require the executive level to be advised so they can adapt and revise their corporate plan.
Communications Plan	Is established as per Section 5.

Document/Process	Requirement
Asset Management Objectives	Are created, maintained and updated as per Section 6.1.
Network Strategies	Are created as per Section 6.2.
AMPs and Investment Cases	Are created as per Section 6.5.
Continuous Improvement Register	Is created, maintained, and operated as per Section 8.1.2.
Critical processes	Asset Management critical processes are identified, mapped and shortlisted for efficiency improvement as per Asset Management Objectives.

Appendix A – Abbreviations

Abbreviations	Definition
AIPS	Asset Investment Planning System
AMP	Asset Management Plan
AMS	Asset Management System
BMS	Business Management System
EMS	Environmental Management System
ENSMS	Electricity Network Safety Management System
DSA	Distribution System Automation
HR	Human Resources
IPART	Independent Pricing and Regulatory Tribunal
PIP	Portfolio Investment Plan
SAIDI	System Average Interruption Duration Index
SAMC	Strategic Asset Management Committee
SCADA	Supervisory Control and Data Acquisition
SMART	Specific Measurable Achievable Relevant and Time-bound
SoC	State Owned Corporation

Appendix B – Referenced Documents, Policies and Legislation

Internal Documents

Document	Relevance to SAMP
Corporate Plan	Key document outputs of the AMS. See Section 6 for specific details.
Asset Management Policy (CECP1004)	
Strategic Asset Management Plan	
Network Strategies and Investment Cases	
Asset Management Plans	Defines the Electricity Network Safety Management System (ENSMS) and Environmental Management System (EMS).
CEOM8047 - Electricity Network Safety Management System Plan	
CECP0002.03 - Board Policy (Governance) Risk Management	Sets the corporate risk management process and requirements which must be adopted into the AMS.
CEOP0002.21 - Risk Management	Sets the process for risk management within the AMS and ensures alignment with corporate risk policies and procedures.
CEOP2111.01 – Asset Risk Management	
CECP0002.30 - Investment Governance Framework	Investment governance processes and frameworks which define the interface with the AMS and investment governance, particularly around C55 operation and output.
CECP0001.02 - Sub-Delegations of Authority by the Chief Executive Officer	
CEOP0002.82 - Network Investment Governance	
CECP0002.32 – Investment Evaluation Procedure	Published unit rate documents which are used in the development of options and financial assessment within the AMS.
Capital Unit Rates – Methods, Source Data, Results	
Operational Unit Rates – Methods, Source Data, Results	Organisational development and Human Resources documentation which define the interface for training, competency requirements and resource acquisition for the AMS.
CECP2000.134 - Study Assistance Policy	
CEOP2000.135 - Study Assistance Procedure	
CEOH2000.114 - How to Submit a Request for Training	
CEOP2000.50 - Training And Development	
CEOP2000.54 - Induction Procedure	
Business Skills and Training Matrix	
Network Skills and Training Matrix	
CEOP2000.05 - Recruitment and Selection	
CEOP2000.53 - Apprenticeships	
CECG2000.90 - Graduate Engineer Program	
CECP4001.01: Preparation and Amendments of Documents	Process to get documents published onto the Business Management System.
Appraisal Value Framework	Describes a constant method of valuing risk mitigation and positive benefits for programs and projects so they may be compared to other projects/programs without bias.
Continuous Improvement Register	Housed on SharePoint to collect AMS improvement items.

Standards and Legislation

Document	Relevance to SAMP
ISO5500X:2014	Guiding standard for developing the AMS.
AS557 – Safety Management System	Standard for how the ENSMS is to operate.
Work Health and Safety Act 2011	Governing Safety Act for Essential Energy.
Electricity Supply Regulation 2014	Governing Electricity Supply Act for Essential Energy.