

COMMERCIAL-IN-CONFIDENCE

# Network Asset Management Plan

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**CEOM 8018**

**2014 - 2019**



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**COMMERCIAL-IN-CONFIDENCE****1. INTRODUCTION****1.1 Purpose of the NAMP**

The Network Asset Management Plan (NAMP) is the overarching document that defines the asset management framework within which the development of the asset management plans (AMP's) takes place. The NAMP consolidates the resources required to manage the network assets to the required service levels in one place.

Additionally, the NAMP links the Business Plan strategic objectives and priority actions to the asset management plan outcomes by defining the asset management objective, key support frameworks, key network service level requirements and customer expectations.

The primary audience expected to reference the NAMP are:

- Networks NSW,
- Chief Operating Officer and Essential Energy's senior management team,
- Asset Managers and Asset Management Plan owners,
- All employees directly associated with the management of network assets,
- Regulatory bodies; and
- Key stakeholders, by request.

The NAMP is an internal business management document and is not publically available without Essential Energy's consent.

**1.2 Scope**

The scope of the NAMP provides an overview of the strategic management of Essential Energy's assets over the five financial years from 2014/15 to 2018/19. The NAMP and associated AMPs provide the primary guide for the management of all network assets required to deliver standard and alternative controlled services. The NAMP includes a consolidated summary of the investment (i.e. all Capex and Opex expenditure) required to achieve the business plan.

Additionally, the NAMP provides an overview of the Asset Management Framework (AMF) and the controlling and supporting processes associated with the overall asset management process. The AMF diagram (see Figure 3) provides a schematic overview of the asset management framework and systems, which is being implemented by Essential Energy, with relevant detail about the key documents and processes.

A key component of the NAMP is a high-level summary of the service levels (see section 5.3) required to manage and operate the network safely, comply with relevant statutory requirements and deliver the standard control services. The standard control services include specific customer requirements (see section 5.3.4) based on customer engagement feedback and the initiatives that will be implemented to deliver optimal service.

The NAMP does not detail network and asset capability and performance targets developed to meet the service level requirements as this activity is undertaken through the asset management process detailed in each individual asset management plan.

All financial data presented in the NAMP is based on real, 2013 dollars. To project actual expenditure in a given year, adjustments must be made for factors such as inflation and expected labour, material and foreign exchange movements, where applicable. For avoidance of doubt, these adjustments are not taken account of in the NAMP or in the supporting AMPs.

**COMMERCIAL-IN-CONFIDENCE****1.3 Overview of Essential Energy and Our Role**

Essential Energy's purpose is encapsulated in the statement:

***To be of service to our communities by efficiently distributing electricity to our customers in a way that is safe, reliable and sustainable***

Essential Energy's values are:



As a State Owned Corporation (SOC), Essential Energy is required to address certain legislative and policy directions. These requirements include:

- Meet the SOC and Energy Services Act legislative obligations; and
- Implement the policy directions of our shareholders regarding the restructure of the publicly-owned electricity distribution businesses in NSW.

Essential Energy's strategic objectives and priorities are designed to promote the long term interests of our customers by delivering three key outcomes:

1. Continuous improvement in safety performance
2. Maintaining the reliability and sustainability of the network
3. Containing average network tariff increases to CPI for our customers

To ensure these outcomes are delivered, Essential Energy has a number of corporate planning documents that ensure that our capital and operating forecasts meet the primary corporate objectives of safety, affordability and reliability. These strategies are:

- The Customer Strategic Plan – Sets a vision for future engagement with customers to ensure best value for money for the services we provide. The strategy has impacted the development of our proposal in two fundamental ways. It has focused our programs on identifying efficiencies in our costs so as to meet our goal of affordability, and has re-focused the business on engaging with our customers on issues such as levels of reliability and safety.
- The Safety Strategic Plan – The objective is to protect the safety of the public, our employees, our contractors and those who are influenced by our business undertakings. Our long term business success depends on our ability to continually improve the quality of our services while protecting people and the environment. The safety plan is a key influence on our asset replacement programs where we have sought to find efficient ways to maintain the safety of the network despite deterioration in the condition of certain assets.
- Asset Management Strategic Plan – Effective asset management is the key to being able to safely and efficiently deliver a reliable and sustainable electricity network, while continuing to promote customer affordability. The plan has focused on ways to prudently defer replacement of assets, through activities such as the prioritisation process.

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- The Risk Management Strategic Plan - Aims to embed a common Risk Management Framework across the three NSW DNSPs, and accordingly provide a common basis for making decisions such as levels of investment to mitigate risk.
- Technology Strategic Plan – The objective is to leverage technology, enable the business' transition to a more efficient business model, and to facilitate delivery of the new business model's objectives. The plan's scope includes information technology and telecommunications, as well as operational and grid technologies. This plan has enabled us to deliver significant reductions in our forecast technology costs over the 2014-19 regulatory control period.
- The Human Resources Strategic Plan – This sets a blue-print on how to transition to efficient workplace change and structural reform introduced under industry reform, and to promote efficient leadership and performance across the business. This plan has been instrumental in shaping our expected expenditure related to implementing efficiency reforms such as the Network Reform Program and the prioritisation process.
- The Finance Strategic Plan – The objective is to manage the financial health of the three NSW DNSPs in a manner that protects financial value and delivers balanced outcomes for both customers and the shareholder. This has influenced our decisions on levels of capex, and on proposing a rate of return that is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk.

Essential Energy is also the owner and operator of the electricity distribution network used to supply electricity to homes and business across 95% of NSW and to the authorised supply areas of Queensland and Victoria and has a significant investment in the physical electricity system and non-system assets. The business requires that these assets and other resources are efficiently and effectively managed to maximise value to all stakeholders and to deliver essential network services.

This requires assets to be created, operated and maintained in a safe and cost-effective manner by efficiently balancing network risk and investment to deliver appropriate service levels. To achieve these outcomes, Essential Energy employs an asset management process.

Asset management covers the processes for planning, creation and development, operation and inspection, condition assessment, maintenance and disposal for all components of the electricity network. The establishment of a functional asset management system and associated asset management activities and practices are a prerequisite for prudent and efficient capital and operating expenditure. Asset management is an integrated process used to deliver Essential Energy's Business Plan objectives and priorities.

## **1.4 Essential Energy's Electrical Network**

Essential Energy is the largest regionally based network service provider in Australia. The core business is the distribution of electricity to customers in a specified geographical boundary of New South Wales and an authorised supply area in Queensland.

Essential Energy's franchise area, as shown in Figure 1, covers approximately 737,000 km<sup>2</sup>, or 95% of New South Wales, with over 815,000 network customers. The electricity distribution network is one component of an integrated system by which electricity is generated, transmitted and then distributed to customers. The network has a large number of asset types across ten different voltage levels, and customers can be connected at any voltage level from 132 kV down to low voltage (400/230 volts) depending on the customer's power needs.

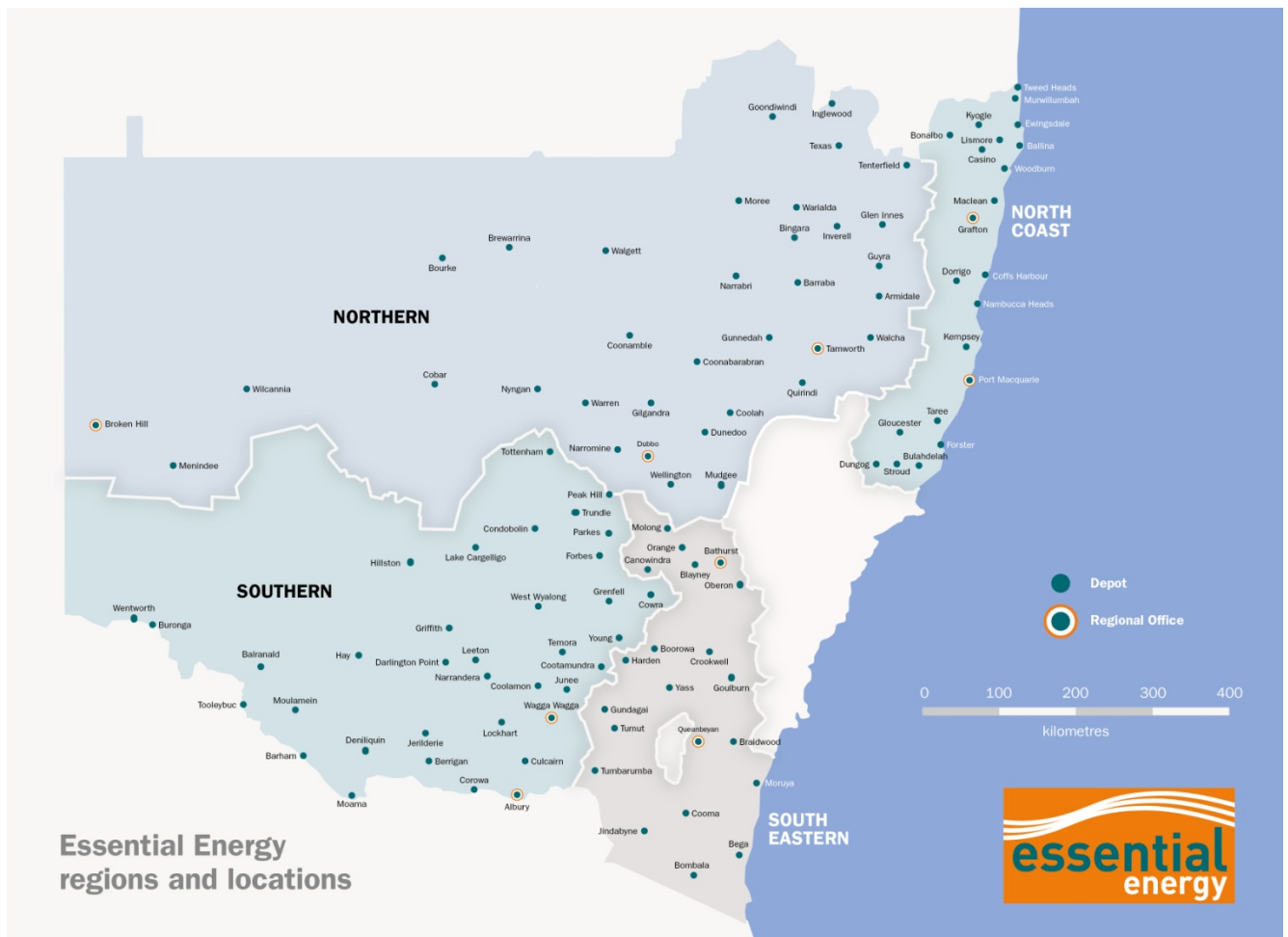


Figure 1 – Essential Energy’s Electricity Network Peak Area

Electrical loads on the network range from large single customers, such as gold and coal mines, cotton gins, abattoirs, feedlots, irrigation pumps, shopping complexes, to urban commercial and residential centres, as well as rural farms, villages and remote Single Wire Earth Return (SWER) connected customers.

Essential Energy’s network consists of approximately 200,000 kilometres of subtransmission, high voltage distribution, low voltage distribution power lines, and approximately 1.4 million poles. This network of ‘wires and poles’ is predominantly an overhead system that traverses terrain varying from coastal, alpine and mountainous in the east to the open plains in the west, and is exposed to a variety of extreme climatic conditions.

The majority of the rural distribution network is radial in configuration with most parts only able to be supplied from one source. There is little opportunity for interconnection with other circuits for security and continuation of supply when performing maintenance activities or in the event of unplanned outages and this is equally true of the radial 132 kV and 66 kV subtransmission networks.

Due to the low customer densities found throughout the rural network, capital expenditure cannot generally be justified to improve this situation. Essential Energy is, however, committed to continually reviewing the reliability of its network in all parts of its supply area with a view to utilising available technologies and appropriate practices to provide the maximum reliability and security of supply possible, within these constraints.

Almost 98% of the network is of an overhead construction type. The overhead system is exposed to environmental conditions and with a relatively high average number of lightning



days (30 per annum) and the impact of lightning and wind from storms on the reliability of the network is significant. These environmental conditions can cause widespread interruptions to the overhead network, which are often difficult and time consuming to locate and repair due to the long radial lines involved.

Over 99% of the distribution substation population are pole-mounted due to the predominately rural nature of the supply area, and the economics of predominantly rural networks. However, this type of distribution substation is inherently more susceptible to unplanned outages than ground mounted distribution substations. These characteristics of the distribution network dictate specific asset management practices and activities in order to minimise unplanned outages and ensure service delivery standards are met.

Network assets have been grouped into logical asset classes based on function, management requirements, voltage level, criticality and other factors relevant to the operation and management of the assets. Asset management plans have then been developed for each of these asset groups.

## **1.5 Other Relevant Documents**

The following documentation should be read in conjunction to the NAMP as it provides essential information that supports or gives necessary context to the NAMP.

### **Electricity Supply Development Review (ESDR)<sup>1</sup>**

This document discloses information about network constraints and loading to assist key stakeholders to express an interest in making alternative proposals and non-network solutions to the identified network constraint.

The NSW Code of Practice Demand Management for Electricity Distributors (Sept 2004) was produced to assist electricity distributors implement strategies that are cost effective by avoiding or postponing network system expansion. Working directly with major customers or companies looking for investment opportunities is just one of the methods used to offer alternative solutions for the network constraints.

To comply with the first stage of the process nominated in the Code of Practice, Essential Energy publishes an Electricity System Development Review (ESDR) annually, containing historical and forecast data as well as a brief description of identified constraints.

For each network constraint forecast to occur within 5 years, a 'Register of Interested Parties' is established to record details of customers, service providers and other parties who wish to be informed of Essential Energy's network plans on an ongoing basis. From time to time Essential Energy will issue 'Requests for Proposals' that invite stakeholders and interested parties to submit proposals to address specific network constraint.

### **Distribution Annual Planning Report (DAPR)**

The annual planning review includes the planning for all assets and activities carried out by Essential Energy that would materially affect the performance of its network. This includes planning activities associated with replacement and refurbishment of assets and negotiated services. The objective of the annual planning review is to identify possible future issues that could negatively affect the performance of the distribution network to enable DNSPs to plan for and adequately address such issues in a timely manner. The outcome of the annual planning review is the Distribution Annual Planning Report (DAPR).

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<sup>1</sup> The Electricity Supply Development Review (ESDR) will be replaced by the Distribution Annual Planning Report (DAPR) in 2013

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Essential Energy is required to prepare and publish a Distribution Annual Planning Report that is compliant with the requirements of the National Electricity Rules (Section 5.13.2 and Schedule 5.8) to:

- provide transparency to Essential Energy's decision making processes and provide a level playing field for all regions in the national electricity market in terms of attracting investment and promoting efficient decisions,
- set out the results of Essential Energy's annual planning review, including joint planning, covering a minimum five year forward planning period for distribution assets,
- inform registered participants and interested parties on the annual planning review outcomes - report on capacity and load forecasts for sub-transmission lines, zone substations and transmission-distribution connection points, plus, where they have been identified, any 11kV primary distribution feeders which were overloaded or forecast to be overloaded within the next two years,
- provide information on Essential Energy's demand management activities and actions taken to promote non-network initiatives each year; and plans for demand management and embedded generation over the forward planning period; and
- assist non-network providers, TNSPs, DNSPs, and connection applicants to make efficient investment decisions.

The DAPR covers a minimum five year forward planning period for distribution network assets.

**Network Management Plan: Chapters 1 - 4**

In accordance with the NSW Electricity Supply (Safety and Network Management) Regulation 2008, Essential Energy has prepared:

- Network Management Plan Chapter 1: Network Safety and Reliability - CEOP802,
- Network Management Plan Chapter 2: Customer Installation Safety Plan - CEOP8004,
- Network Management Plan Chapter 3: Public Electrical Safety Awareness Plan - CEOP8005; and
- Network Management Plan Chapter 4: Bush Fire Risk Management Plan - CEOP8022.

Essential Energy will update these documents at least annually in accordance with the requirements of the Director-General, the New South Wales (NSW) Electricity Supply (Safety and Network Management) Regulation 2008, and the Commissioner, Section 67 of the Queensland (QLD) Electrical Safety Act 2002 and Section 166 of the QLD Electrical Safety Regulation 2002. These other relevant documents are not asset management specific documents, but do refer to common processes and activities undertaken by Essential Energy in the process of managing the network assets.

**1.6 NAMP Review Timeline**

Date	Activity
August	Review NAMP against previous financial year's figures and update as required
September	NAMP's revised and submitted for approval

December	NAMP revised to include updated AMP outputs
April	NAMP and preliminary financial plan approval for next Financial Year

Table 1 – Review table

## 1.7 Structure of the NAMP

The NAMP is structured into several chapters as detailed below:

- Chapter 1 outlines the intended audience, the scope of the document and provides a general overview of Essential Energy and a brief description of the distribution network Essential Energy owns and operates.
- Chapter 2 sets out the asset management standard and practice and describes the context in which asset management takes place, including the accountabilities and responsibilities.
- Chapter 3 details the asset management framework (AMF) and outlines the key documents and systems that facilitate the overall asset management process.
- Chapter 4 summarises Essential Energy’s Business Purpose and the strategic objectives detailed in the Business Plan.
- Chapter 5 summarises the high level network service levels and customer requirements.
- Chapter 6 details the general network management strategies required to deliver the network service levels, customer requirements and Business Plan objectives.
- Chapter 7 summarises the Investment Plans, including the Capital Investment Plan and Operation Investment Plan and includes a consolidated summary of the expenditure requirements developed and justified in each asset management plan.
- Chapter 8 outlines the AMP monitoring and asset management improvement plan.
- Chapter 9 lists the abbreviations, key terms and definitions used in the NAMP.
- Chapter 10 tables the revisions.
- The Appendix contains details of the relevant Essentials Energy and external documents used to manage the network assets and other detailed information.

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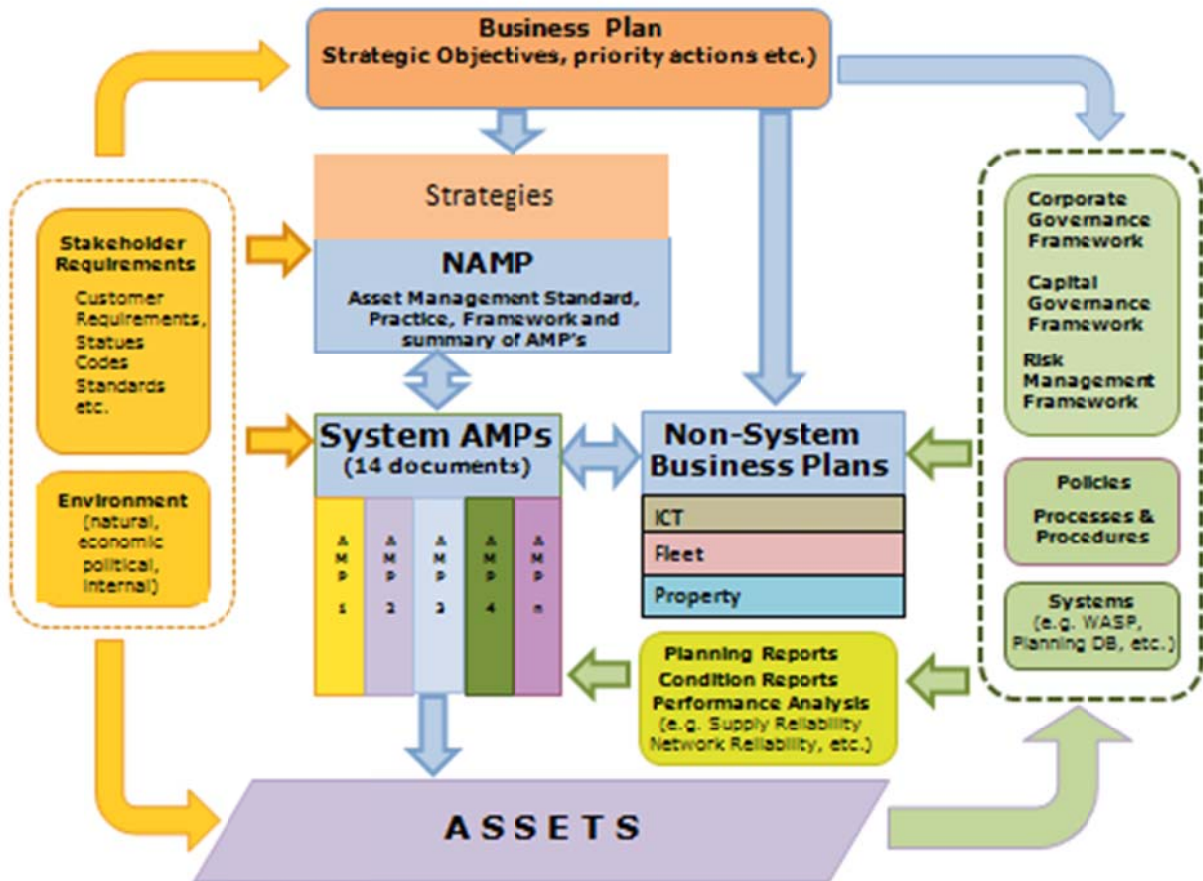
**2. ASSET MANAGEMENT PRACTICE**

**2.1 Asset Management Context**

The asset management context describes the general boundaries within which the AM process is undertaken and refers to the circumstances and structure within which the business operates. Essential Energy is a Distribution Network Service Provider (DPNS) operating in the Australian National Electricity Market (NEM) and as such, is governed by the National Electricity Rules (NER). Essential Energy provides regulated network service to customers in NSW, and the franchise area of Queensland and Victoria.

Essential Energy's principal role is outlined in sections 1.3. The organisation is charged with the stewardship of the electrical assets required to provide electricity to and from customers in the franchise area and to execute this duty, Essential Energy applies an asset management process as outlined in chapter 2, and operates under an asset management framework as described in chapter 3.

Figure 2 below illustrates the key relationships and interfaces of the asset management process as practiced by Essential Energy.



**Figure 2 – High level asset management context**

## 2.2 Asset Management Standard

Essential Energy's asset management system and associated processes are based on the PAS 55-1:2008<sup>2</sup> standard, and comply with the NSW Treasury requirements for Total Asset Management TPP 08-2.

The PAS 55 standard details the specifications and guidelines for optimised asset management and is based on the quality management *Plan-Do-Check-Act* (PDCA) framework. Essential Energy's asset management process, as illustrated in Figure 2 is similar to the PAS 55 standard.

The key components of Essential Energy's asset management system are:

- Business Plan and strategic objectives
- Asset Management Policy, strategies and plans
- Organisational values, functional standards and processes
- An asset life cycle of acquire, utilise, maintain and renew/dispose
- Portfolio of assets
- Performance and condition monitoring and continual improvement
- Asset management enables and controls

Essential Energy's asset management is closely aligned to PAS 55 standard as shown in Table 2 below.

Essential Energy documents, processes, systems and activities used to undertake asset management compared to the PAS 55	Main sections of PAS 55
Essential Energy's Business Plan	Organisational strategic plan
Asset Management Policy – CECP1004	Asset management Policy
Network Strategy documents: <ol style="list-style-type: none"> <li>1. Reliability Strategy – CEOP2463</li> <li>2. Quality of Supply Strategy – CEOP2090</li> <li>3. Demand Management Strategy – CEOP1121</li> <li>4. Distribution Growth Strategy – CEOP2091</li> </ol> Chapter 6 of the NAMP provide an overview of the high level network management strategies.	Asset management strategies
Section 2.5 of the NAMP defines the overall asset management objective. Each AMP captures stakeholder requirements and specific objectives for the associated AMP.	Asset management objectives

<sup>2</sup> Publicly Available Specification (PAS) published by British Standards Institute (BSI) and developed in conjunction with the UK Institute of Asset Management (IAM)

<b>Essential Energy documents, processes, systems and activities used to undertake asset management as specified in the PAS 55</b>	<b>Main sections of PAS 55</b>
<p>Essential Energy has 13 Asset Management Plans (AMP's) and 1 vegetation management plan that constitutes a suite of asset management plans.</p> <ol style="list-style-type: none"> <li>1. Distribution Overhead Feeders - CEOM8018.01</li> <li>2. Customer Connections - CEOM8018.03</li> <li>3. Distribution Substations - CEOM8018.04</li> <li>4. Network Underground Systems - CEOM8018.05</li> <li>5. Subtransmission Overhead Feeders - CEOM8018.06</li> <li>6. Telecommunication Equipment - CEOM8018.07</li> <li>7. Load Control Equipment - CEOM8018.08</li> <li>8. SCADA &amp; DSA equipment - CEOM8018.09</li> <li>9. Generation - CEOM8018.10</li> <li>10. Subtransmission Transformers - CEOM8018.11</li> <li>11. Subtransmission Equipment - CEOM8018.12</li> <li>12. Customer Metering - CEOM8018.13</li> <li>13. Public Lighting Equipment - CEOM8018.14</li> <li>14. Vegetation Management - CEOM8018.15</li> <li>15. Network Metering - CEOM8018.16</li> </ol>	Asset management plans
<p>Business Plan (section 4)</p> <p>All relevant internal and external standards and regulations (detailed in Asset Management Framework and appendix 1)</p> <p>Essential Energy processes ( Asset Management Framework – section 3.2)</p> <p>Appendix 2 – Reference documents</p>	Organisational values, functional standards and processes
<p>Section 2.6 of the NAMP outlines the asset management process and the life-cycle activities.</p> <p>Each AMP details the lifecycle strategies developed to meet the performance targets based on stakeholder requirements and demand for the asset.</p>	Acquire, Utilise, Maintain, Renew / dispose
<p>Each AMP details asset condition and capability, performance requirements and improvement activities.</p>	Performance and condition monitoring
<p>Chapter 8 of the NAMP provides a high level overview of the improvement process and initiatives to be developed.</p> <p>Each AMP details relevant improvement plans and asset management initiatives to improve the asset management process.</p> <p>The Corporate Dashboard captures organisational KPI's and improvement initiatives.</p>	Continual improvement
<p>Essential Energy procedures, systems and databases which details asset management enablers, data sources, control systems, management processes and information sources</p>	Asset management enablers and controls

**Table 2 – Essential Energy's asset management alignment with PAS 55 standard**

## 2.3 Asset Management Principles<sup>3</sup>

Asset management principles provide the foundation of good asset management and Essential Energy has aligned its asset management process to the 'Asset Capability Concept Model' developed by the Asset Management Council of Australia and the four key principles outlined in this model.

**Principle 1:** Assets must have a focus on measurable outputs, consistent with the Corporate Objectives.

This principle refers to the outputs that the asset is required to deliver, that are the measurable service levels required by the stakeholders. This focus on the delivery of a measurable output must be matched to the organisations strategic objectives and priorities, with a commitment to achieve the defined outputs.

**Principle 2:** To achieve outputs, asset requires capabilities and enablers.

Asset management is not about the assets, it's about what the asset can do – the capability of the assets to deliver the service levels and meet stakeholder requirements. Asset capabilities are both the inherent functions of the physical assets and the enabling capabilities of the organisation, such as controls and processes that support and maintain the asset capabilities. A fundamental activity of asset management is to determine the current and future asset capability requirements.

**Principle 3:** Asset outputs require a level of assurance that the objectives will be achieved.

The outputs derived from the assets must have a level of assurance that they are in fact delivering the required outcomes, where the level of assurance can be defined as the quantifiable level of confidence of the assets capability to deliver the required outputs, consistent with the organisations objectives. Risk management plays a key role in developing a level of assurance that the assets will deliver the required outcomes within acceptable risk tolerances.

**Principle 4:** Good asset management organisations are learning organisations.

A learning organisation can be defined as an organisation that actively seeks knowledge and embraces change to improve its services and outputs. A learning organisation encourages its employee to measure success or failure, challenge and improve processes and activities where appropriate, and to adapt to changes as necessary. The approach of a learning organisation is to practice continuous improvement that focuses on people, their understanding of their role, their ability to influence processes and their ability to challenge without the feeling of threat.

Essential Energy's overall asset management process is based on these four principles, which are the foundation of good asset management, and the development of each asset management plan is consequently based on these principles, as demonstrated in the activities and outcomes of the asset management plans.

## 2.4 Essential Energy's Asset Management Policy

The Asset Management Policy (CECP1004) is a deliberate statement of objectives and requirements intended to guide decisions and actions to achieve the Business Plan strategic objectives. The AM policy sets out the objectives to be achieved by Essential Energy's asset management practices and mandated requirements for the developing and implementing the asset management strategies.

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<sup>3</sup> Aligned with the Asset Management Council of Australia document - 'Asset Management Body of Knowledge' pages 6 - 9.

This policy influences and guides the asset management process and is applied through the NAMP, supporting AMPs, and all of Essential Energy's asset management practices.

## 2.5 Asset Management Objective

The Business Plan gives specific weight to safety as a number one priority, while continuing to deliver defined services and appropriate financial returns within a framework of risk management and sound governance. That is, Essential Energy is committed to managing its network assets in a results-oriented manner to ensure safety, performance and value related targets are met and to achieve these outcomes, the principal asset management objective is:

**'To manage the network assets to minimise lifecycle cost whilst meeting the high level network service obligations set out in section 5.3 of the NAMP, and the asset specific obligations set out in each Asset Management Plan, within the risk tolerance of the business.'**

This overall asset management objective influences and directs the specific service level obligations developed in each asset management plan as well as the risk assessment and optimisation criteria set out in each of the asset management plan.

## 2.6 Asset Management Process

Essential Energy's asset management process aims to deliver the required network services in an efficient and sustainable manner in the long-term interests of our customers. Hence, the asset management process employed by Essential Energy is based on a best practice model produced by the Institute of Asset Management (UK) and generally aligns with the PAS 55 standard for optimised asset management.

## 2.7 Asset Management Accountabilities and Responsibilities

The key accountabilities and responsibilities applicable to the management of the network assets are set below.

Responsibility	Responsible people
Guide and audit asset management activities	All asset managers
Review and update AMPs	All AMP authors
Submit AMPs for approval	AMP owners
AMP approval	AMP authors and relevant senior managers
Update NAMP	Capital works program manger
Review NAMP	Group Manager Asset Management Planning
NAMP authorisation	Manager Asset and Network Planning
NAMP approval	Chief Engineer

**Table 3 – Accountabilities and Responsibilities**



## **3. ASSET MANAGEMENT FRAMEWORK**

### **3.1 Introduction**

Asset management covers the processes for planning, creation, operation, inspection, condition assessment, maintenance and disposal for all components of the electricity network in order to maintain the required service levels at the lowest lifecycle cost and within the risk tolerance of the business. The establishment of a functional asset management system and associated asset management activities and practices are a prerequisite for prudent and efficient capital and operating expenditure. To this end Essential Energy has developed the asset management framework described in this chapter to support and facilitate these outcomes.

Essential Energy's asset management framework (AMF) describes the combination of systems, processes and data sources that facilitate the practice of asset management in a systematic and disciplined manner. The AMF diagram shown in Figure 3 illustrates the key elements of this framework and shows their high level interactions.

The AMF integrates planning processes, decision-making and information across all network asset management activities. It provides a structure within which stakeholder needs, levels of service, asset information, financial requirements, risk and resources are brought together to enable balanced, consistent and informed decision making. Hence, this framework enables the cost-effective provision of the required service levels to our customers and facilitates the ongoing stewardship of the network assets.

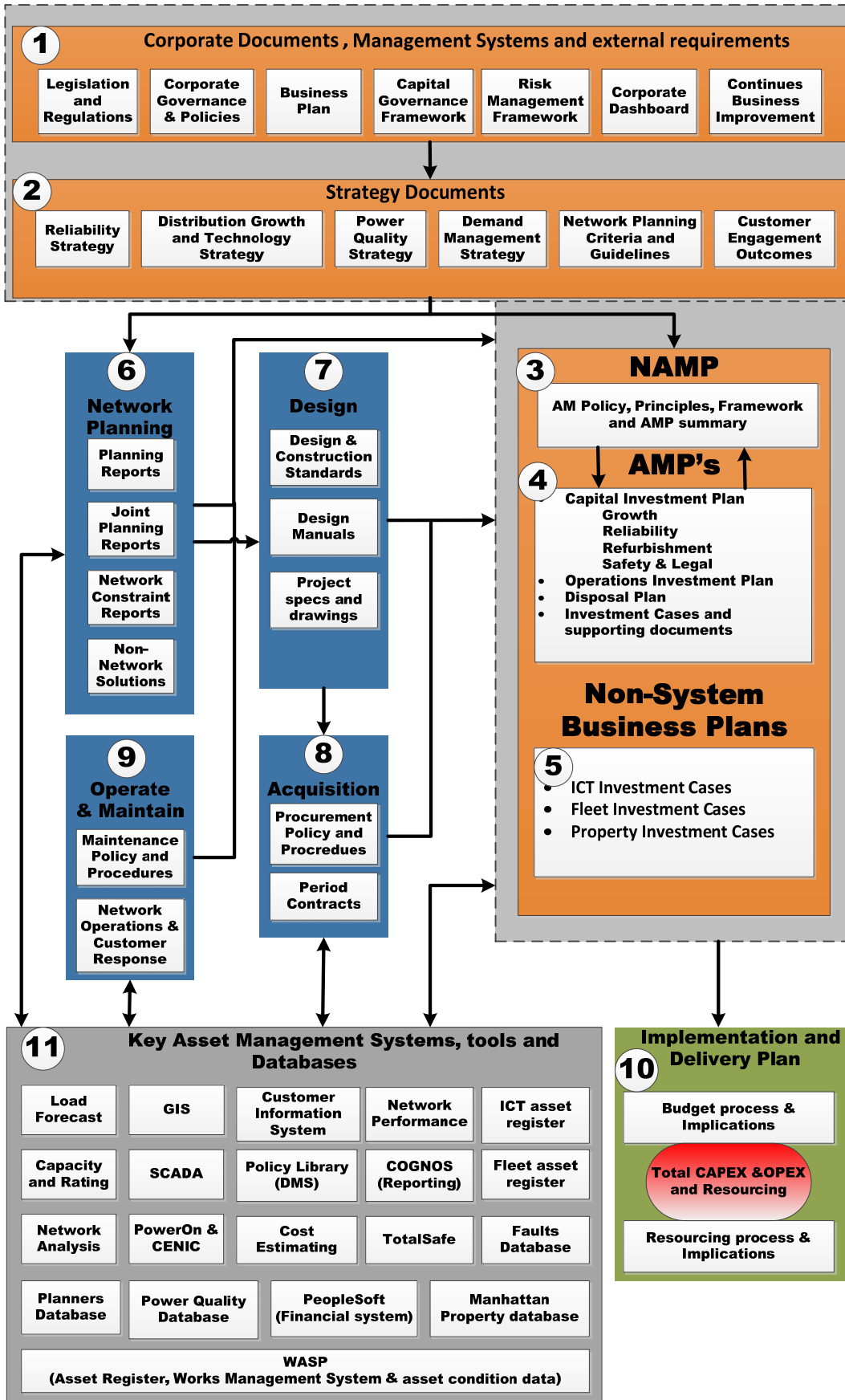
The AMF shown in Figure 3 provides a simplified illustration of how the asset management process is structured, with links indicating the key associations and interactions. The purpose of the AMF diagram is to facilitate an understanding of the asset management process by providing a high level visual representation of the key asset management systems and processes employed by Essential Energy.

The AMF diagram indicates eleven (11) key areas that facilitate and support the asset management process:

1. Corporate Objectives, Management Systems and external requirements
2. Strategy Documents
3. Network Asset Management Plan (NAMP)
4. Asset Management Plans (AMP's)
5. Demand Forecast
6. Network Planning
7. Design
8. Acquisition
9. Operate and Maintain
10. Implementation and Plan Delivery
11. Key Asset Management Systems, Tools and Databases

These areas are further defined in section 3.2.

### 3.2 Details of the Asset Management Framework



**Figure 3 - Asset Management Framework (AM Framework)****1. Corporate Documents, Management Systems & External Requirements<sup>4</sup>**

These documents, systems and external requirements define the key objectives and parameters that influence how the business operates and how the stakeholder's requirements are reflected into the business objectives and strategies. That is, this area of the AM framework defines the rules and boundaries of why and how the business will operate and provides an overall guide and direction to all business divisions. It includes:

External Requirements

- Legislation and Regulations which refers to external Acts, Regulations, Policies, Rules, as well as external standards and documents relevant to the asset management process. These documents are listed in the Network Management Plan Chapters 1- 4.

Key Overarching Management & Control Documents

- Business Plan - the Business Plan states the business purpose, strategic outcomes, key priorities and fundamental values used to direct and guide the business.
- Corporate Policies:
  - Leadership - Principles And Values CECP0001
  - Board Policy - Governance CECP0002
  - Safety, Security, Health & Environment CECP1000
  - Essential Energy's Code of Conduct CECG3000.01
  - Asset Management CECP1004
  - Human Resources CECP1005
  - Finance CECP1006
  - Risk Management CECP1021
- Capital Governance Framework CEOP2191
- Risk Management Procedure CEOP2111
- Corporate Dashboard: this system is used to capture, monitor and report on the key business performance indicators.
- Continues Business Improvement: this process embeds a culture of ownership and accountability and facilitates a robust business wide productivity measurement methodology.

**2. Strategy Documents**

The Strategy documents detail the long-term actions and plans required to deliver specific objectives and network outcomes based on stakeholder requirements and long-term network performance criteria. In general, the strategies are developed to deliver an overall network outcome and as such are usually applicable to more than one asset group or class of assets.

Included in this area of the AM framework are the key documents that outline the network planning criteria and load forecasting methodologies which set the bases for analysis the network performance against identified network constraints.

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<sup>4</sup> Numbering of these headings align to the Asset Management Framework diagram numbering - see figure 3

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The Customer Engagement Survey results provide a valuable insight to the customer requirements and are detailed in section 5.3.4.

Strategy Documents & Related Overarching Documents

- Reliability Strategy CEOP2463
- Power Quality Strategy CEOP2090
- Demand Management Strategy CEOP1121
- Distribution Growth Strategy CEOP2091
- Network Planning Criteria and Guidelines CEOP8003
- Customer Engagement Outcomes 2012

**3. Network Asset Management Plan (NAMP)**

The NAMP (this document) provides an overview of the asset management process and framework and summarises the key outcomes of the asset management plans (see below). Additionally, the NAMP provides asset managers with a concise reference point for the high level network service requirements and the asset management principles as well as an overview of the asset management process and key strategies.

The NAMP also provides a summary of the resources detailed in the individual AMPs.

- Network Asset Management Plan CEOM8018

**4. Asset Management Plans (AMP's)**

The asset management plans (AMP's) are strategic plans that guide the asset management activities applied to each asset class to deliver the service levels required by our stakeholders.

Each AMP defines the service levels applicable to the asset group, based on stakeholder requirements and then compares asset capability and current performance to identify any service performance gaps and their causes. Performance targets are developed based on service level requirements and asset capability, and then strategies are developed to address performance gaps in the context of the overarching network strategies outlined in area 2 of the AMF. This process is outlined in more detail in section 3.4.4 and Figure 5.

The Asset Management Plans are:

- Distribution Overhead Feeders CEOM8018.01
- Customer Connections CEOM8018.03
- Distribution Substations CEOM8018.04
- Network Underground Systems CEOM8018.05
- Subtransmission Overhead Feeders CEOM8018.06
- Telecommunication Equipment CEOM8018.07
- Load Control Equipment CEOM8018.08
- SCADA & DSA Equipment CEOM8018.09
- Generation CEOM8018.10
- Subtransmission Transformers CEOM8018.11
- Subtransmission Equipment CEOM8018.12
- Customer Metering CEOM8018.13
- Public Lighting Equipment CEOM8018.14
- Vegetation Management CEOM8018.15

- Network Metering CEOM8018.16

The grey area around areas 1, 2, 3 and 4 of the AMF (figure 3) highlights the key asset management document set.

## **5. Non-System Business Plans**

Non-System Business Plans cover the following main areas:

- ICT Business Plan
- Fleet Business Plan
- Property Business Plan

These Non-System business plans are not detailed further in the NAMP as these plans are not directly associated with network assets and are fully detailed in the Non-System documentation.

## **6. Network Planning**

The Network Planning process develops Essential Energy's network is in accordance with the Electricity Supply Act 1995 as amended, National Electricity Market Code, and NSW Code of Practice – Demand Management for Electricity Distributors, as well as internal planning criteria and guidelines. Network Planning strategies and key network planning documents are detailed in section 6.2 of the NAMP.

## **7. Design**

The purpose of the design process is to convert Network Planning requirements into practical plans and specifications that, together with asset information from area 11 of the AM framework, provide a key input to the asset management process.

### Key Design Documents

- |  |          |
|--|----------|
| • Transmission & Zone Substation Design Guidelines | CEOP8032 |
| • Subtransmission design procedure                 | CEOP2291 |
| • Subtransmission line design manual               | CEOM7081 |
| • Underground design manual                        | CEOM7098 |
| • Overhead design manual                           | CEOM7097 |
| • Renewal and Refurbishment Guidelines             | CEOM7094 |
| • High voltage protection guideline                | CEOP8002 |
| • SCADA & DSA Design Guidelines                    | CEOP8084 |
| • Public Lighting Management Plan                  | CEOP1023 |

## **8. Acquisition**

The procurement process facilitates efficient purchasing of network equipment and related resources and provides a key input to the asset management process.

### Key Procurement Documents

- |   |          |
|---|----------|
| • Procurement Manual                                    | CEOP2438 |
| • Strategic Procurement & Contracts: management process | CEOP6001 |
| • Materials Inventory manual: Contestability            | CEOM7004 |
| • Evaluating New Material / Products for Consideration  | CEOP2375 |

**9. Operate & Maintain**

The purpose of the Operate and Maintain process is twofold: (1) Operate the network in a safe and efficient way and (2) maintain the network to keep an asset or group of assets in good working order to maintain service potential. These two activities provide essential inputs to the overall asset management process and the main strategies and key maintenance and operational documents are detailed in sections 6.9 and 6.10 respectively.

**10. Implementation & Plan Delivery**

An output of the asset management process is the implementation and plan delivery, where the strategies identified to address the network or asset performance gaps are executed with awareness for the required resources. Essentially, this is the matching of budgets and resources to deliver the annual works plans developed to achieve the required service levels through the projects and programs of work identified in each asset management plan.

Delivery strategies and key project management and contract management documents are detailed in section 6.12 of the NAMP.

**11. Key Asset Management Systems, Tools & Databases**

The key asset management systems, tools and databases area of the AM framework include many processes, systems and databases that provides functionality and information which supports and enables all aspects of Essential Energy's asset management practices.

Key processes

- Load forecast
- Network modelling, capacity and rating analysis
- Cost Estimating
- Asset creation (construction)
- Network Performance monitoring
- Asset Inspection and defect processing
- Operate and Maintain
- Asset retirement

Key systems and databases

- Planner's database
- Power quality database
- Geographical Information System (GIS)
- Works, Assets, Solutions and People (WASP – asset management system)
- Primavera project management system
- SCADA (System control and data acquisition)
- PowerOn & CENIC (network management and network information system)
- COGNOS (reporting system)
- TotalSafe (database of safety, operating and performance related issues)
- Policy Library and Objective (document management system)
- Customer information system (CIS)
- Faults database
- PeopleSoft (Financial and HR system)
- Monthly complaints report (countrynet/countrynet.nsf/Content/cust-rel-pub3-cr)

### 3.3 Key Supporting Frameworks

Essential Energy has an established set of Corporate Policies that provide a framework for the business' capital governance practices. In particular, the Governance Policy (CECP0002), Asset Management Policy (CECP1004) and Risk Management Policy (CECP1021) set the primary governance requirements that frame the business' capital governance practices and guide all asset investment. These governance practices ensure a rigorous process for developing, prioritising, approving and controlling all aspects of investment cases, works plans, and all other aspects of expenditure related to service delivery.

#### 3.3.1 Capital Governance Framework

The Capital Governance Framework aims to provide a consistent approach to the way that Essential Energy:

- Determines where to allocate capital, utilising an effective prioritisation process.
- Manages the delivery of our capital projects and programs.
- Reports on progress and outcomes, including benefits realisation.
- Manages risk in the delivery of the capital portfolio.

Associated documents that facilitate and support capital governance:

Capital Governance Framework – Capital Portfolio and Investment

Approvals policy	CEOP2191
Business Impact Assessment: Capital Governance & Risk	CEOM7524
Business Case: < \$1M or Exempt	CEOF6243.05
Preliminary Corporate Investment-Non System: Part A-Projects >\$1M	CEOF6243.03
Corporate Investments - Non system Projects > \$1M	CEOF6243.01
Supplementary corporate Investment - Non System	CEOF6243.06
Managing Director Approval Submission: Non Systems Projects	CEOF6243.04
Asset: Capitalisation	CEOP2416

#### 3.3.2 Corporate Governance Framework

Corporate governance provides the framework and direction that determine how Essential Energy operates and how it is managed. It influences how the business strategies are set and objectives achieved, how risk is gauged and monitored, and how performance is assessed and maximised.

Good corporate governance optimises business value by encouraging sound commercial practice in an environment of accountability, risk control and ethics. It is more than meeting the legal obligations placed upon the Board, management and employees. Effective governance practices strive to positively influence the behaviour and culture of a business in meeting the highest standards of accountability, transparency and productivity.

Associated documents that facilitate and support corporate governance:

Essential Energy Code of Conduct	CECG3000.01
Corporate Policy: Finance	CECP1006
Corporate Policy: Governance	CECP0002

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Corporate Policy: Safety Security, Health & Environment Policy	CECP1000
Corporate Governance: Probity Plan	CECG3000.03
CHRM Guideline: Building a Respectful Workplace	CECG2000.60
CHRM Guideline: Disciplinary Action	CECG2000.82
CHRM Guideline: Performance Management	CECG2000.81
CHRM Guideline: Performance Recovery	CECG2000.80
CHRM Manual: Employee Handbook	CECM2000.49
CHRM Guideline: Equal Employment Opportunity and Diversity	CECG2000.62
Information Security: Compliance Audit Plan	CEOP1105
Legal Services: Right to Information	CEOP2296
Media: Incident Guidelines	CEOP2224
Property: Disposal Procedure	CEOP1107
Risk: Fraud and Corruption Control	CEOP2443
SSHE Manual System Audit Report Template	CEOF1001.01
SSHE Manual: Auditing & Inspection	CECM1000.06
Statement of Business Ethics	CEOP1115
Procurement Manual	CEOP2438

**3.3.3 Risk Management Framework**

Essential Energy is committed to maintaining sound risk management practices and International standard ISO 31000 and AS/NZS ISO 31000:2009 standard for risk management provides the benchmark for Essential Energy's risk management process.

Essential Energy has a wide range of risk management procedures and processes in continual use and these interrelated activities form the organisation's risk management framework. The risk management framework makes an important contribution to the business as it strives to achieve its Business Plan and objectives by identifying, analysing, evaluating and treating risks to maximise opportunities and minimise potential impacts.

Essential Energy's risk management framework, within the context of asset management, provides a rigorous process to quantify and evaluate network risk and is based on two key documents, specifically:

- The Risk Management Policy (CECP1021) which stipulates the guiding rules and commitments that Essential Energy will follow to integrate risk management into all asset management and network related activities and tasks.
- Corporate Risk Management Procedure (CEOP2111) provides the framework to enact the commitments made in Essential Energy's Risk Management Policy and to satisfy the requirements of NSW Treasury and the State Owned Corporations Act to ensure adequate risk management systems are in place. Section 4.1 of CEOP2111 details this risk management framework.

Essential Energy's main corporate risk management activities and functions are:

- **Corporate Risk Assessment:** An annual risk assessment is undertaken with divisional management and the Executive. The assessment identifies, analyses, and rates risks to determine which ones are material business risks. This assessment considers Essential Energy's corporate objectives. Each material business risk is assigned an executive owner and the material business risks are provided to the Executive for endorsement and the Audit and Risk Committee for approval.



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- **Strategic planning:** The strategic planning process and the corporate risk assessment are interrelated. Material business risks are considered during the strategic planning process.
- **Corporate risk management plans:** Risk management plans to address the material business risks are developed by divisional management and approved by the Executive owner. The status of the risk management against these plans is reported to the Executive on a monthly basis and at Audit and Risk Committee meetings.
- **Internal audit program:** The internal audit program is aligned with the material business risks and Essential Energy's corporate objectives. The internal audit program is endorsed by the Executive and approved by the Audit and Risk Committee. Any resulting action items from the audit program are approved by the Executive sponsor of the audit. The status of resulting action items are independently monitored and reported to the Audit and Risk Committee quarterly.
- **Audit and Risk Committee:** The Audit and Risk Committee include representatives from the Essential Energy Board and are responsible for oversight of the risk management framework and internal audit within Essential Energy.
- **Risk Work Group:** The risk work group consists of representatives from divisional management and provides a communication channel for risk management activities between the business, the Executive and the Audit and Risk Committee.

Associated documents that facilitate and support Corporate Risk Management:

Corporate Policy: Risk Management	CECP1021
Corporate Risk Management Procedure	CEOP2111

The Asset Management Plans (AMP's) are developed in accordance with this risk management framework and comply with the risk management policy and risk management procedure.

### 3.4 Key Asset Management Documents

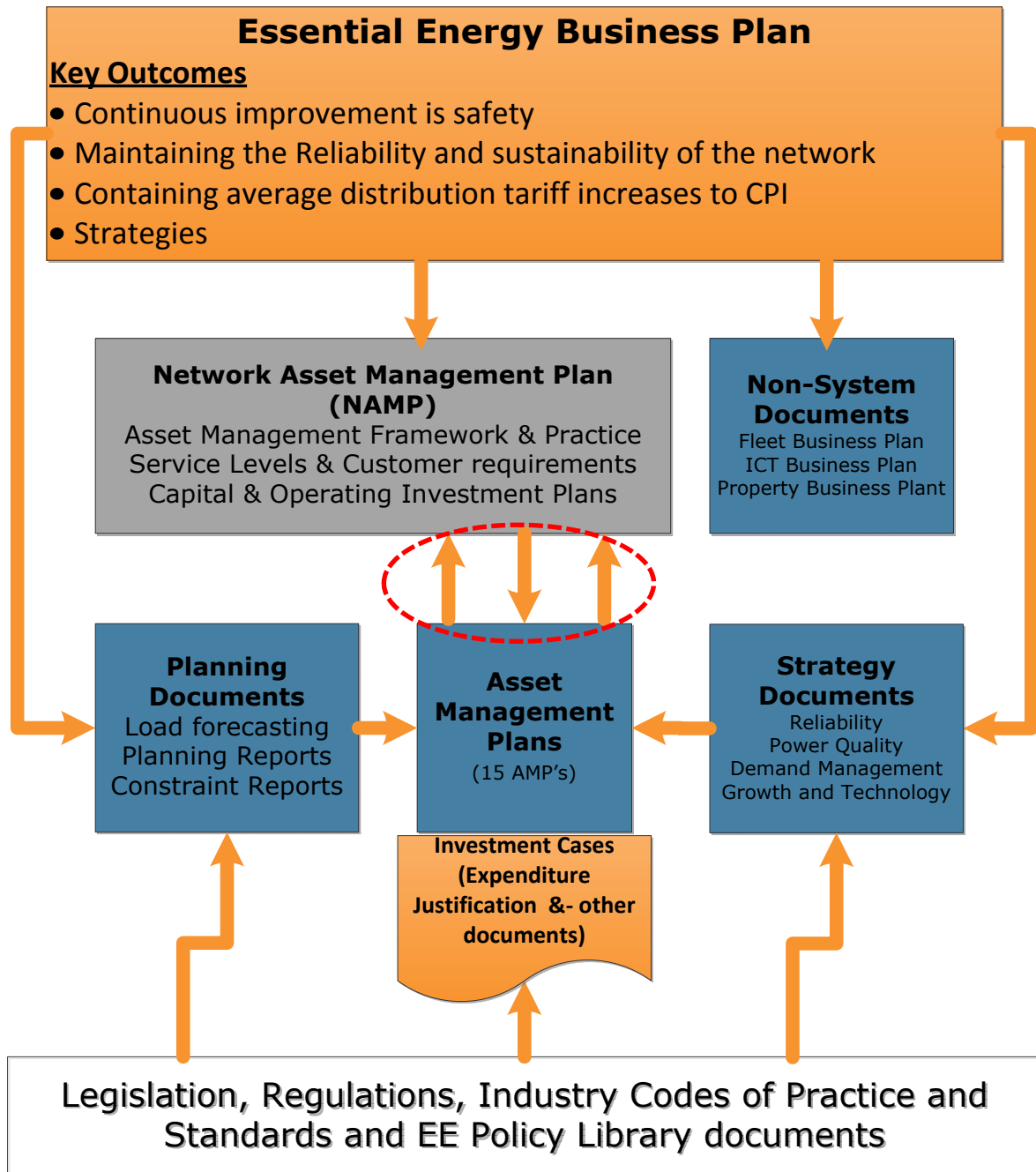


Figure 4 - Overview of the Key Asset Management documents

An important function (highlighted by the red dashed area in Figure 4 above) is the influence of the NAMP on the development of the asset management plans, where asset management principles, practices and standards direct and guide the asset management activities at asset level. The outcomes of these asset management activities, essentially the projects and programs of work detailed in the asset management plans, is summarised back into the NAMP to provide an overall consolidated view of the prioritised and optimised expenditure required to deliver the service levels detailed in the respective AMPs.

#### 3.4.1 Essential Energy Business Plan

The Business Plan states the strategic objectives and priorities used to direct and guide the business - see section 0 for additional details of the Business Plan.

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**3.4.2 Network Asset Management Plan**

The NAMP (CEOM8018) provides a consolidated summary of the outputs of the asset management plans as well as an overview of the asset management practice, standards and principles that are applied throughout the asset management plans. The NAMP also outlines the asset management framework and the context in which asset management takes place. The NAMP links the Business Plan strategic objectives and asset specific targets to the delivery of network services (Section 5.3) through to the asset management plans.

**3.4.3 Non-System Plans**

Essential Energy’s Non-System Business Plans and supporting documents set out the objectives and strategies that enable and support efficient and prudent network asset management. These Non-System business plans are not detailed in the NAMP as these business plans are not directly associated with network assets.

**3.4.4 Asset Management Plans**

The Asset Management Plans (AMP’s) set out Essential Energy’s strategies and associated resource plans for the management of specific assets or asset groups based on the Business Plan strategic objectives, stakeholder requirements and asset capability. The asset management plans include all the relevant information and data to demonstrate prudent and efficient management of all regulated system assets as well as some specific non-regulated assets. The asset management plans are listed in chapter 3.2, section 4.

The controls and management processes in place to ensure appropriate governance and strategic management of the assets are detailed in chapter 3 – asset management framework, including the overarching strategy documents that influence or guide the asset management plan in achieving the stakeholder requirements and the Business Plan strategic objectives.

The AMP on a page (Figure 5) provides a simplified diagram indicating the structure of Essential Energy’s asset management plans with section numbers to facilitate easy reference to specific asset management activities and requirements.

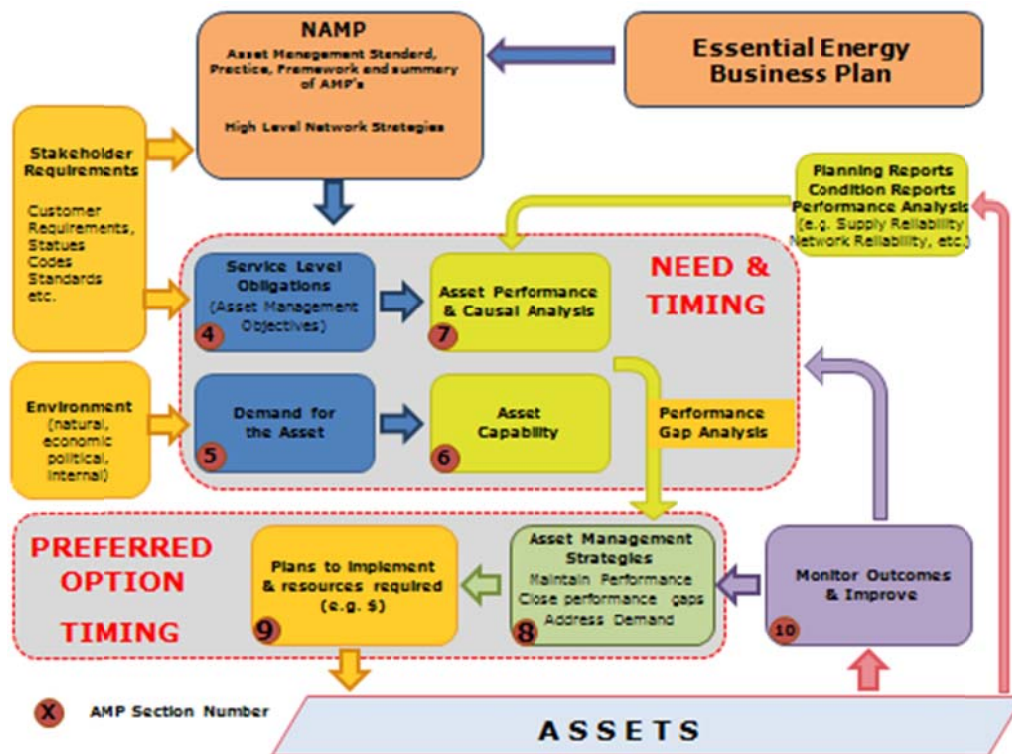


Figure 5 – AMP on a Page

**Service Level Obligations** (AMP section 4) – this section identifies the relevant asset management requirements of the various stakeholders and hence defines the required service levels, criticality, and risk management criteria along with the asset management objectives.

**Forecast Service Demand** (AMP section 5)– this section sets out the demand for the assets services and provides insight into the drivers of demand, the basis of the forecast, assumptions, sensitivities and the forecast’s confidence level.

**Asset Information & Capabilities** (AMP section 6) – this section provides an overview of the assets that Essential Energy currently uses to meet the stakeholder requirements. It also considers the key issues relevant to understanding the overall current state of the business’ assets.

**Asset Performance & Risk** (AMP section 7) – this section presents an assessment of the performance of the Essential Energy’s assets against the required service levels and in the context of the service demand forecast over the timeframe of this AMP. Maintenance of service level performance is assessed, and any performance gaps are defined in terms of the extent, timing, risk and cause of the service level gap(s).

**Life Cycle Management Strategies** (AMP section 8) – this section sets out the life cycle strategies that Essential Energy will apply to the management of the business’ assets. Each strategy is defined and linked to the maintenance or achievement of the required service levels and the interrelationships of these strategies across the broader business are considered.

**Asset Investment Plans** (AMP section 9) – the specific investment plans that the business will use in following the asset management strategies are documented in this section, along with relevant supporting information regarding cost, timeframe and resourcing (as appropriate). The relationships between the plans and overarching strategy are also considered along with the interrelationships between these plans and the plans of the broader business. The section ends with a Resource Requirement Summary which provides a summary of the costs of this plan as well as a summary of any specific resource requirements (as applicable).

**Monitoring & Improving Asset Management** (AMP section 10) – this section focuses on the performance and development of Essential Energy’s asset management strategies, capabilities and technology. The AMPs include references to supporting investment cases, relevant planning reports and other documents that justify and support the expenditure streams identified in the AMPs.

### 3.4.5 Network Investment Cases & Planning Reports

The Network Investment Cases justify the projects and a program of work identified in the AMPs to meet the performance criteria and demand for the assets. Most AMPs will be supported by several investment cases specific to the asset class or group of assets and are referenced in the respective AMP.

### 3.4.6 Subtransmission Planning Documents

Planning Review Reports, Planning Options Reports and New Network Asset Reports (NNAR’s), associated with the Network Planning process, provide a comprehensive record of the outcomes of investigations and analysis of network constraints, capacity and capability requirements and options developed to meet stakeholder requirements.

The Subtransmission planning documents provide detailed justification for planning related projects and programs of work and are referenced in the respective AMPs.

### 3.4.7 Network Document Structure

Essential Energy must adhere to the NSW State Records Act 1998 by making and keeping full and accurate records of the business activities of the organisation. This includes

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capturing and managing records in any form, including physical and electronic records such as e-mails. CEOP1060 details the procedural guidelines and provides an appropriate framework for record management that will promote best practice and meet legislative, evidential and accountability requirements. Essential Energy's records are its corporate memory and are vital assets for ongoing operations, supporting the efficiency and effectiveness of the organisation, and providing legislated evidence of business activities and transactions.

Essential Energy is committed to comply with the NSW State Records Act 1998, and implement best practice recordkeeping to ensure the capture, creation, maintenance, protection and disposal of records with appropriate evidential and accountability characteristics. All practices concerning recordkeeping within Essential Energy are to be in accordance with this Procedural Guideline. A specific area of focus is the identification, collection, indexing, filing, storage, maintenance and disposal of all Occupational Health and Safety records, and Environmental records, to ensure compliance with the requirements of:

- AS/NZS 4801 Occupational Health and Safety Management systems – 2001
- WorkCover NSW OHS Model for Self-Insurers, and
- ISO14001 Environmental management Systems – 2004.

Key Document Management Procedures

Corporate Policy: Records Management  
Policy and Procedure Framework

CEOP1060  
CECP4001.01

## 4. ESSENTIAL ENERGY'S BUSINESS PLAN

### 4.1 Introduction

Essential Energy is focused on satisfying the legal, moral and social obligations of a State Owned Corporation and is required by legislation to provide to the shareholder an annual Statement of Corporate Intent (SCI) which describes the nature and purpose of Essential Energy's capital and operating expenditure program. To develop and deliver part of the SCI the organisation has a well-defined Business Purpose and a specific Business Plan with strategic objectives and priority actions. The Business Plan provides a clear direction for the asset management process and targets to achieve.

### 4.2 Strategic Objectives

#### 4.2.1 Improve Safety Performance

Safety is our number one priority and the responsibility of every employee. We seek to encourage a culture where no-one knowingly participates in an unsafe act and our goal is to keep our workers safe and healthy. One of the ways we will measure our success is by reducing our Lost Time Injury Frequency Rate (LTIFR) to equal to or below 2.2 by June 2014 and by constantly striving to be an incident-free organisation. Included in this objective is the introduction of a 'Fair and Just Culture Program' to support cultural change and safety behaviour. We will also deliver safety leadership and competency training programs.

For 2013-2014 we will focus on:

- mitigating network fatality risks,
- developing an industry-wide Health & Safety Management System; and
- implementing consistent standards, incident investigations, safety audits, risk management, compliance and reporting.

What (priority action)	How	When	Target
Implement the Safety Strategic Plan	Improve safety behaviours, culture and performance with a focus on fatal risk management, an effective Safety Management System, and safety training and development	June 2014	LTIFR ≤ 2.2

#### 4.2.2 Improve Customer Value

We aim to deliver network prices that represent the best 'value for money' for our customers by containing average distribution network prices to CPI or below

Another aspect of improving customer value is to reassess our relationship and engagement with our customers and retailers. A key focus of this relationship is to better understand consumer preferences on price, reliability, technology and energy services and shape the network of the future on this understanding. Additionally, we will develop and deliver our AER submission on time to justify and support the development of a safe, reliable, sustainable and affordable network throughout FY14 to FY19.

What (priority action)	How	When	Target
Deliver the Customer Value Improvement Plan	Improve our efficiency through functional reviews, fleet policy initiatives and the workforce plan to contain	FY14 – FY 19	Average distribution network prices to CPI or

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	average distribution network prices to CPI or below		below
Develop the Network Reliability Plan	Use diagnostics to identify causes of incidents and develop initiatives that efficiently and effectively improve reliability	December 2013	Complete and approved Network Reliability Plan

**4.2.3 Deliver the Network Plan**

Good asset management is key to running a safe, reliable and sustainable electricity network while containing distribution network average price increases to CPI, and in managing our network we have to balance costs, reliability standards and benefits for our customers, while minimising network risks. This means that new asset replacement criteria, reliability risk tolerance and risk mitigation strategies will be applied; ensuring that every dollar spent is prioritised to deliver a safe, reliable and efficient network.

What (priority action)	How	When	Target
Develop our Network Reliability Plan	Use diagnostics to identify causes of incidents and develop initiatives that efficiently and effectively improve reliability	December 2013	Complete and approved Network Reliability Plan

**4.2.4 Achieve the Financial Plan**

Essential Energy is obliged by legislation to operate as efficiently as any comparable business and this demands prudent asset investment and efficient day-to-day operations.

We intend to prepare a sound regulatory proposal in 2013-2014 that continues to deliver safe and reliable electricity at an affordable price for homes and businesses. The AER determination is critical for Essential Energy as it will set the revenues we receive over the five year period from FY15 to FY19 and achieving the financial plan will require consistent application of the Capital Governance framework and diligent monitoring of expenditure. Essential Energy will also achieve savings by delivering the Network Reform Program.

This program includes:

- Streamlining corporate and support services; removing functional duplication; and sharing better practices.
- Implementing policy changes and capital programs that deliver better practice across the industry, especially in network planning and maintenance; and fleet and property.
- Streamlining sourcing processes to produce large savings in the procurement of products and services.

What (priority action)	How	When	Target
Deliver the Customer Value Improvement Plan	Improve our efficiency through functional reviews, fleet policy initiatives and the workforce plan to contain average distribution network prices to CPI or below	FY14 – FY 19	Average distribution network prices to CPI or below
Develop and deliver the AER submission	Develop a prudent capital and operating plan to deliver real improvement in	FY15 transitional	Both submissions

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on time	network performance and efficiency	submission by January 2014  FY15 to FY19 submission by May 2014	complete by due dates
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**4.2.5 Manage Business Risk**

Our risk management framework helps us identify and control risks that could affect our people, customers, assets, and financial and legal status, as well as the communities we serve and the environment we operate in.

We have identified nine strategic risks that may impact our business and outlined the actions required to manage these risks.

<b>Risk Category</b>	<b>Definition</b>
<b>Safety</b>	Fatality/serious injury of an employee or member of the public.
<b>Network</b>	Significant customer service supply failure. A component of our network risk is bushfire risk. Essential Energy continued its efforts to improve how this risk is mitigated and to provide appropriate governance and assurance oversight through the Bushfire Risk Assurance Panel.
<b>Finance</b>	Significant unbudgeted financial loss.
<b>Compliance</b>	Material breach of legislation or licence.
<b>Reputation</b>	Sustained public criticism.
<b>Environment</b>	Significant environmental incident.
<b>People</b>	Failure to deliver performance through people.
<b>Strategy</b>	Strategic objectives are not delivered and business opportunities lost.
<b>ICT</b>	Significant ICT service failure.

<b>What (priority action)</b>	<b>How</b>	<b>When</b>	<b>Target</b>
Successful roll-off of Transition Services Agreement (TSA) and deliver network operational readiness	Complete the transition of customers and relevant services to Origin Energy in line with the TSA and deliver operational readiness initiatives	By October 2013 as required by Origin Energy	Successful roll-off of Transition Services Agreement

**4.2.6 Deliver Performance through People**

Capable, skilled people are critical to the success of achieving Essential Energy's purpose. In particular, we will focus on the leadership performance, workplace culture and organisational capability required to deliver out strategic objectives.

Key initiatives include:



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- Leadership performance: We'll continue to develop leadership capability, actively manage performance, and plan succession to key roles.
- Cultural priorities: We'll foster a shared commitment to our purpose and values, building safety into the 'DNA' of the organisation, and align the way we work and reward employees with our cultural priorities.
- Organisational capability: We'll match our workforce to the changing business structure, develop the core technical skills we need and embed change management principles.

What (priority action)	How	When	Target
Implement aligned leadership capability programs	Develop programs for all leadership roles to foster a shared commitment to our purpose and values	Aligned programs in place by December 2013	No target

**4.2.7 Leverage Technology**

Technology underpins our infrastructure and the way we deliver electricity to our customers; it is also key to us becoming more efficient.

Key initiatives for 2013-2014 include:

- taking advantage of joint procurement opportunities
- consolidating functions where appropriate
- leveraging network technology trials and eliminating duplication
- automating processes to reduce manual capture of information in the field
- improving information-sharing with third parties, in particular automating the flow of data from contractors
- implementing technologies to support network performance in the areas of automated distribution management and customer load control.

What (priority action)	How	When	Target
Develop our Network Reliability Plan	Use diagnostics to identify causes of incidents and develop initiatives that efficiently and effectively improve reliability	December 2013	Complete and approved Network Reliability Plan

### 4.3 Balanced Scorecard

Essential Energy utilises a balanced scorecard approach to align business activities to the vision and business plan and monitor performance against strategic targets. The targets for the balanced scorecard are defined each year during strategic planning sessions and communicated to the Board for approval.

The Balanced Scorecard for 2013-14 is detailed in the table below and the asset management plans focus on the asset centric targets and develop projects and programs of work and to achieve these targets, wherever possible<sup>5</sup>.

What the Key Result is	How it will be Measured	What the Target is
<b>Safety</b>		
Safe, Capable & Motivated Employees	Lost Time Injury Frequency Rate (LTIFR)	≤2.2
	Total Recordable Injury Frequency Rate (TRIFR)	25
	Reportable incidents – controllable SENI	37
<b>Customer/Community</b>		
Valued by our Community	Customer satisfaction	75%
	Reportable incidents – NECF type 1 breaches*	no target
Protect Public Safety & Environment	Reportable incidents – environmental	4
Reliable & Sustainable Network	Network reliability – average unplanned SAIDI(minutes)	236
<b>Financial</b>		
Financial Stability	NPAT(\$m)	\$176.5
Efficient Operations	OPEX budget (\$m)	\$550.2
	Overtime expenditure – total (\$m)	\$34.2
<b>Business Process</b>		
Network Plan Delivery	Asset Management Plan % complete	95%
Governance, Risk & Compliance Management	Audit recommendations outstanding ≥ 90 days	0
	Risk treatment plans outstanding ≥ 90 days	0
<b>Culture</b>		
Safe, Capable & Motivated Employees	Absenteeism (excluding family/carer's leave)	4.9
	No. of employees with a Gross to Base Ratio at or above 1.5	75

<sup>5</sup> Not all key results or targets in the 2013 – 2014 Balanced Scorecard can be influenced or achieved through the projects and programs detailed in the AMPs.

#### **4.4 Business Plan and key outcomes**

The Business Plan provides a direct input to the NAMP, Strategy documents; Planning process and AMPs (see

Figure 4) and the projects and programs of work detailed in the AMPs are specifically developed to contribute to achieving the Business Plan outcomes and targets.

### **5. STAKEHOLDER REQUIREMENTS AND SERVICE LEVELS**

#### **5.1 Introduction**

To develop the capital and operating program, Essential Energy is developing a comprehensive understanding of the relationships between the prices charged for services and the value derived by customers and other stakeholders, and only with this understanding can the long-term value of regional development, environmental management and social responsibility be effectively incorporated into the strategic planning and Business Plan.

This section defines the relevant stakeholders and outlines the high level service requirements that are further considered in the respective AMPs, where the service requirements are defined and asset performance gaps are identified and addressed.

#### **5.2 Stakeholders**

The stakeholders are anyone who affects or can be affected by an organisation's actions and hence have a vested interest in the organisation. Essential Energy's key stakeholders are:

##### **5.2.1 Network Customers**

Essential Energy's network customers are defined as the electricity users connected to the physical electrical network owned and operated by Essential Energy. These customers are key stakeholders as they pay for and receive the services provided by the organisation. Essential Energy hears the voice of the customer and section 5.3.4 details the outcomes of the customer engagement survey undertaken in 2012.

##### **5.2.2 Essential Energy's Shareholder**

Essential Energy is owned by the Government of New South Wales who wishes to ensure that the financial capital employed by Essential Energy is secure and the owner expects an appropriate return for their investment. The specific requirements of the shareholder are documented through legislation, regulations, licence conditions and government directives.

##### **5.2.3 Other Stakeholders**

Other stakeholders who have an interest in Essential Energy's asset management practices include:

- Employees and contractors who carry out work on the network assets,
- Landowners on whose land network assets are located,
- The community at large in relation to safety, the environmental, social and economic impacts of Essential Energy assets,
- Electricity retailers who sell energy to customers connected to the Essential Energy network,

- TransGrid and PowerLink, the transmission network service providers in New South Wales and Queensland respectively to which the Essential Energy network is connected,
- Regulatory bodies with which Essential Energy interacts such as the Australian Energy Regulator (AER) and the New South Wales Independent Pricing and Regulatory Tribunal (IPART) and Australian Energy Market Operator (AEMO); and
- Relevant statutory authorities with which Essential Energy interacts such as the Department of Planning, Department of Natural Resources, Environmental Protection Authority, Roads and Maritime Authority and Rail Infrastructure Corporation.

The requirements of all of Essential Energy's stakeholders influence or determine the service levels as outline in the following section.

### **5.3 High Level Network Service Requirements**

This section lists the high level network service obligations specific to the management of Essential Energy's network, based on a hierarchy of requirements. The legal and statutory obligations are listed first, licence requirements next, standard's requirements following and then the customer and community requirements. The section on customer requirements details survey results and initiatives to be undertaken to ensure customer requirements are addressed. The business requirements specific to the different asset classes and groups and in some cases, specific assets, are detailed in the relevant asset management plans.

#### **5.3.1 Statutory Requirements (Legislation, Regulations & Codes of Practice)**

Essential Energy manages its network assets to ensure that the statutory obligations of the business are met. These statutory obligations can be derived from both Federal and State Acts and Legislation. The following categories of statutory compliance are relevant to the management of the network assets and are carried through to the asset management plans where the asset capability and performance are assessed against these specific requirements and appropriate strategies set out which address any identified performance gaps in the most cost efficient way.

- **Health & Safety**

The network assets are managed in a manner which ensures Essential Energy's obligations in regard to the safety of its employees, contractors and the public are met. Most of the assets have the potential to harm if they are not appropriately operated and maintained. Occupational health and safety for employees in New South Wales is controlled under a legislative regime which includes Acts, Regulations, and Codes of Practice. The principle legislation is the Work Health and Safety Act 2011(NSW) and the supporting regulations, the Work Health and Safety Regulation 2011 (NSW).

- **Network Safety**

#### **Code of Practice: Electricity Transmission & Distribution Asset management 2008**

The Electricity Supply Act 1995 (The Act) provides the framework for promoting industry efficiency generally through establishing a balance of competition and regulation. There is also scope for benefit to customers as a whole in limited standardisation of infrastructure design and service procedures that promote:

- Community Safety,
- Compatibility among electricity supply systems,
- Economies of scale; and

- Freedom for buyers to exercise choice.

Essential Energy is bound by the provisions of the Electricity Supply (Safety and Network Management) Regulation 2008 (NSW), that requires the development and lodgement of a Network Management Plan, which is routinely audited. Amongst other matters, Essential Energy's Network Management Plan must include a commitment to ensuring the safe operation of the distribution system, and to giving safety the highest priority over all other aspects of network management. This plan must provide safety management strategies, including emergency response and bush fire risk management (see following section for further details).

Essential Energy is also required to adopt the Code of Practice – Electricity Transmission and Distribution Asset Management 2008, as directed by the Director General under the Electricity (Safety and Network Management) Regulation 2008. This code of practice aims to provide guidance as to cost effective practices and procedures that are intended to protect the interest of customers and public particularly in relation matters of safety. A licence holder is required to state its policy on the adoption of this code in its compliance annual report.

This code outlines the policy and standards that apply to the design, construction, maintenance and operation of electricity works and has provides for high standards in relation to the safety and integrity of the Network.

The code applies to network operators, service providers and any of their sub-contractors working on electricity works or operating electricity transmission or distribution systems and as is the case for Essential Energy where directed by the Director General in NSW, the network operator is bound to comply with the code.

- **Service Connection Rights**

The ESA 1995 provides customers with rights to be connected to the network. This places a demand on DNSPs like Essential Energy to make provision for service connections when requested by customers or ASP's and retailers (on the customer's behalf). Refer to Part 3, Division1, 15 (1), (2), & (3) of ESA 1995.

Essential Energy is obliged to specify the service connection type, route, and construction standard and typically requires the applicant to provide the installation of the service line/s and associate point of connection equipment.

- **Metering Legislation**

The following categories of statutory compliance are relevant to the management of metering assets:

- *Every connection point shall have a metering installation*  
In accordance with the National Electricity Rules Section 7.1.2, every connection point must have a compliant metering installation<sup>6</sup>.
- *New metering equipment shall meet accuracy requirements*  
The National Electricity Rules Schedule 7.2.3 provides accuracy requirements for all metering installations by installation type, which apply to all newly-installed metering equipment. This constrains Essential

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<sup>6</sup> Excluding type 7 (unmetered supplies)

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Energy in choice of metering equipment to meters and instrument transformers that comply with the prescribed accuracy requirements.

- *Existing metering equipment shall be tested to comply with class accuracy*  
In a similar manner to accuracy requirements for new metering equipment, Schedule 7.3 of the National Electricity Rules prescribes the inspection and testing obligations for metering equipment over the life of the asset.
- *Metering Installation Malfunction*  
A metering installation malfunction occurs when the installation does not:
  - Meet the requirements of Schedule 7.2 of NER - Types and Accuracy of Metering Installations;
  - Record, or incorrectly records energy data; or
  - Allow, or provide for, the collection of energy data.

- **AEMO Communications Requirements**

Under chapters 4 and 5 of the NEC (National Electricity Code), AEMO may request data from a Distribution Network Service Provider in order to discharge its market power and system security functions. These requirements are embodied in the AEMO Standard for Power System Communications 2004, and typically affect Essential Energy when the following occurs:

- Essential Energy undertakes a development in an area which is seen by AEMO as a 'critical' part of the interconnected Subtransmission network.
- Where a cogeneration facility is to be connected in excess of 30MW, or > 15MW if the facility is a wind farm.

Under the AEMO standard, Essential Energy is obliged to supply analogue values of operating parameters of relevant facilities (such as feeder currents and power flows), as well as discrete values such as CB positions, etc. in real time<sup>7</sup>.

- **Radio Frequency Spectrum & Radiation**

Essential Energy manages a significant Telecommunications asset base requiring access to the Radio Frequency spectrum. Access and use of the Radio Spectrum must be undertaken in compliance with the Radio communications Act 1992.

Management of these radio assets includes the administration of over 1220 licences issued by the Australian Communications and Media Authority (ACMA) which sets out the conditions of use for Radio Frequency Spectrum. The management of these assets must be undertaken in full compliance with the licence and regulatory conditions.

- **Polychlorinated Biphenyl Compounds**

All of Essential Energy's Subtransmission transformer assets are oil-filled and historically some transformer oils contained polychlorinated biphenyl compounds (PCB's). PCBs are a class of highly persistent, bio-accumulative chemicals covered by the Stockholm Convention on Persistent Organic Pollutants.

<sup>7</sup> Sampling intervals for various data types are defined the Section 2.3 of the AEMO standard for power system data communication 2004

The NSW Government enacted the Environmentally Hazardous Chemicals Act 1985 under which the NSW EPA can make Chemical Control Orders (CCOs) with respect to assessed chemicals or declared chemical waste. Essential Energy is in the process of removing all PCB's from their transformers under direction of the NSW EPA's PCB Chemical Control Order 1997. Under the National PCB Management Plan, Essential Energy has until 2016 to ensure all its transformers are PCB-free.

- **Oil Containment**

There are specific statutory requirements relating to the management of oil and bulk fuel (e.g. Broken Hill generation plant) containment. The statutory requirements relating to the management of secondary oil containment is addressed at the relevant asset level with the appropriate controls and measures detailed in the Asset Management Plans as well as various Essential Energy procedures and practices.

- **Bushfire Protection**

The updated edition of Planning for Bush Fire Protection (PBP) 2006 was developed by the NSW Rural Fire Service to enable the NSW Government to work jointly with local government and the public and private sectors to link responsible planning and development control with the protection of life, property and the environment. Bush fire is a major challenge for the community, and Essential Energy has an important role to play in ensuring that its network assets do not contribute to the development or propagation of bushfires at any time.

Of note is the requirement to count fire starts without regard for the size of the fire. This potentially forces Essential Energy to place as much importance in its quest for compliance on a minor fire on a grass verge with a large conflagration which destroys thousands of hectares of bush.

- **Water Pollution**

The Protection of the Environment Operations Act 1997 (POEO Act) contains general requirements for the minimisation of water pollution due to site run-off, while the National Water Quality Management Strategy (NWQMS) provides a framework for action and a series of guidelines and scientific criteria that help improve water quality. As part of its participation in the NWQMS, the NSW Government has established processes to coordinate water quality management programs across all State Government agencies. The management and disposal of potentially contaminated run-off is detailed within Essential Energy's Safety, Security, Health and Environmental Manual: Water (CECM1000.73).

- **Noise**

In NSW noise pollution is regulated through the Protection of the Environment Operations Act 1997 (POEO Act). This Act falls under the jurisdiction of the NSW Department of Environment and Heritage. Under the requirements of this Act sound pressure levels at a substation's nearest residence are not to exceed 35dBA.

### 5.3.2 Licence Requirements

Following a review of Essential Energy's licence conditions in 2007, the then Minister for Energy imposed revised reliability performance conditions pursuant to item 6(1) (b) of Schedule 2 of the Electricity Supply Act 1995 with effect from 1 December 2007<sup>8</sup>. The revised reliability performance conditions as set out in the 'Design, reliability and performance – distribution network service provider's licence conditions – 1 December 2007' (Licence Conditions) are enforceable under the Electricity Supply Act 1995 by IPART and the Minister, but are not enforceable against Essential Energy by individual customers. While the Licence Conditions are subject to Ministerial review with any changes effective from 1 July 2014, no current amendments have been identified other than those specifically set out in clause 14.5 of the Licence Conditions.

In accordance with the requirements of its licence, Essential Energy manages its network assets to comply with these revised reliability performance requirements. These requirements are summarised in the following tables. For further details refer to the relevant schedules of the Licence Conditions or the relevant AMPs.

#### Schedule 1<sup>9</sup>

Applicable Date	Network Element & Load Type	Forecast Demand or Expected Demand	Security Standard	Customer Interruption Time
From 1 December 2007	Sub-transmission Overhead Systems	≥15MVA	N-1	< 1minute
From 1 December 2007	Distribution Feeder – urban	Any	N-1	< 4 hours
	Distribution Feeder – non-urban		N	Best practice repair time
Till 30 June 2014	Zone substation and transformers	≥ 15MVA	N-1	< 1 minute
		<15MVA	N	Best practice repair time
From 30 June 2014	Zone substation and transformers	≥ 10MVA	N-1	< 1 minute
		From 30 June 2014: <10MVA	N	Best practice repair time

Table 4 - Design Planning Criteria as defined in Schedule 1 of the Licence Conditions

<sup>8</sup> Minister for Energy, 1 October 2007, 'Design, Reliability and Performance, Licence Conditions for Distribution Network Service Providers'.

<sup>9</sup> Schedule 1 will become redundant on 1 July 2014 as the revised reliability requirements titled 'Reliability and Performance Licence Conditions for Electricity Distributors' will commence on 1 July 2014.



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CEOM8018

**Schedule 2**

<b>Feeder Type</b>	<b>SAIDI – Average Reliability Duration Standards (Minutes per customer)</b>	<b>SAIFI – Average Reliability Frequency Standards (Number per customer)</b>
Urban	<b>125</b>	<b>1.8</b>
Short-rural	<b>300</b>	<b>3.0</b>
Long-rural	<b>700</b>	<b>4.5</b>

Table 5 - Reliability Standards as defined in Schedule 2 of the Licence Conditions

**Schedule 5**

<b>Type of area in which customer's premises is located</b>	<b>Interruption duration standard (hours)</b>	<b>Interruption frequency standard (number of interruptions of ≥hours)</b>
Non-metropolitan	<b>18</b>	<b>4 interruptions ≥ 5 hours</b>

Table 6 - Customer Service Standards as defined in Schedule 5 of the Licence Conditions

**5.3.3 Standards Requirements**

In observing its obligations in regards to safety, environmental, and quality of network services within acceptable levels of corporate risk, Essential Energy complies with good electricity industry practice through adherence to a range of engineering standards relevant to achieving sound asset management outcomes.

- **Overhead Line & Distribution Substation Construction**

ENA HB C (b) 1 Code of Practice for Overhead Line Construction was developed by the Electricity Supply Association of Australia in 1954. It became the Guidelines for the design and maintenance of overhead transmission lines in 1991 and was further updated in 2003 and 2006. This document provided the foundation for the design and construction of the majority of Essential Energy's network and in combination with a range of Australian Standards is the source of many of the requirements set out in the following internal documents used to guide construction, inspection and maintenance practices related to the identification of defects on the network.

Subtransmission & Distribution Network Planning Criteria & Guidelines

	CEOP8003
Distribution Planning Manual	CEOM7092
Overhead Construction Manual	CEOM7099
Overhead Design Manual	CEOM7097
Asset Inspection Manual	CEOM7005
Overhead Construction Manual	CEOM7099
Ground Mounted Substations	CEOM7199
Overhead Design Manual	CEOM7097
Ground Mounted Substations	CEOM7098
Substations within Customer Premises	CEOS5005

A new Australian standard, AS/NZS 7000:2010 Overhead Line Design Standard replaced ENA HB C (b) 1. It was developed to ensure a nationally consistent approach to overhead line design and to assist network owners in their regulatory determinations. This standard is only applicable to the design of new overhead lines, it is not intended to be retrospectively applied to the routine maintenance and on-going life extension of Subtransmission and distribution networks constructed using the superseded ENA guidelines. As a standard, it sets out prescriptive, minimum requirements and establishes a minimum standard of engineering compliance.

Essential Energy's guidelines and manuals have now been amended in accordance with the requirements of this new Australian standard. These internal documents are used in combination with AS/NZS 7000:2010 to identify non-conformance with the relevant engineering standards and hence to identify defects.

- **Underground Assets Construction**

A range of Australian standards apply to the design, construction, inspection and operation of Underground Assets. The Australian Standards are the source of many of the requirements set out in the following internal documents:

Subtransmission & Distribution Network Planning Criteria & Guidelines	CEOP8003
Distribution Planning Manual	CEOM7092
Underground Construction Manual	CEOM7199
Overhead Construction Manual	CEOM7099
Asset Manual	CEOM7005
Asset Inspection Manual	CEOM7009
Asset Inspection Critical Distribution Equipment	CEPG2034
Underground Asset Inspection & Maintenance	CEOP2474

- **Voltage Regulation & Power Quality**

The Australian standard AS 6003.8 Standard Voltages and the Electricity Supply Act 1995 set parameters for both supply voltage and power quality which must be maintained at any electricity customers' point of supply. Essential Energy's network assets contribute to the performance of the network in meeting these requirements, although this contribution is generally limited to meeting the voltage limits. The growth of embedded generation through the uptake of photovoltaic (PV) systems is presenting Essential Energy with some challenges meeting these standards.

The Australian Standards is the source of many of the requirements set out in the following internal documents:

Electricity Supply Standard	CEOP8026
Power Quality Strategy	CEOP2090

- **Earth Potential Rise & Security - Relevant to Telecommunications**

Essential Energy is committed to the compliance of standards relating to the delivery of copper based services into locations that present an Earth Potential Rise hazard. The current standard AS/NZS 3835 and all sub parts must be adhered to for the delivery of copper services when an EPR hazard is present. Additionally, the Telecommunications group are required to maintain certification under the security standard ISO 27001 as per state memorandum 2007-04.

- **Navigable Waterways**

The Australian Standard AS 6947 Crossing of waterways by electricity infrastructure 2009 was developed and published in 2009 to mitigate against the safety issues associated with electrical assets crossing waterways.

Electricity cables and conductors which cross navigable waters can pose a hazard to water crafts navigating the waterways. The most significant potential hazards are posed by live, overhead, electricity crossings. Masts, crane jibs, aerials and the like may contact the overhead electricity conductors and anchors may become entangled with submarine cables. Such events may cause damage to the vessel, serious injury to its occupants and even death. Other consequences include damage to the electricity infrastructure and loss of supply, environmental impacts and legal and financial liabilities.

- **Public Lighting Code & Standards**

Essential Energy is committed to compliance of the NSW Public Lighting Code 2006 by way of commitments made by all DNSPs to Department of Energy, Utilities and Sustainability upon its introduction in 2006 and also by way of written commitment by reference in its Public Lighting Management Plan (CEOP1023).

The 2006 PLC imposes a large number of obligations on PLSPs (Public Lighting Service Providers), with an overall goal to maintain lights safely, efficiently and effectively over the economic life in accordance with the in-service values for Category V and Category P standards specified in AS/NZS 1158.

### **5.3.4 Customer/Community Requirements & Customer Engagement Outcomes**

- **Customer Survey**

In June 2012, Essential Energy conducted a major research program to explore customer's knowledge, attitudes and behaviours around electricity consumption and investment decisions.

This qualitative research was complemented by a survey with a sample size of over 1000 Essential Energy network customers. Research findings identified six clear customer values. These values are the essence of what is important to our customers and the ways in which they would like Essential Energy to manage these issues as a network distribution business.

Utilising the values obtained from our research has already informed a number of network programs. Such insights are also useful when making investment and business decisions, because they ensure the concerns of the customer are considered when planning capital and operating expenditure. Figure 6 outlines the customer values, what they mean and what we are doing to address them.

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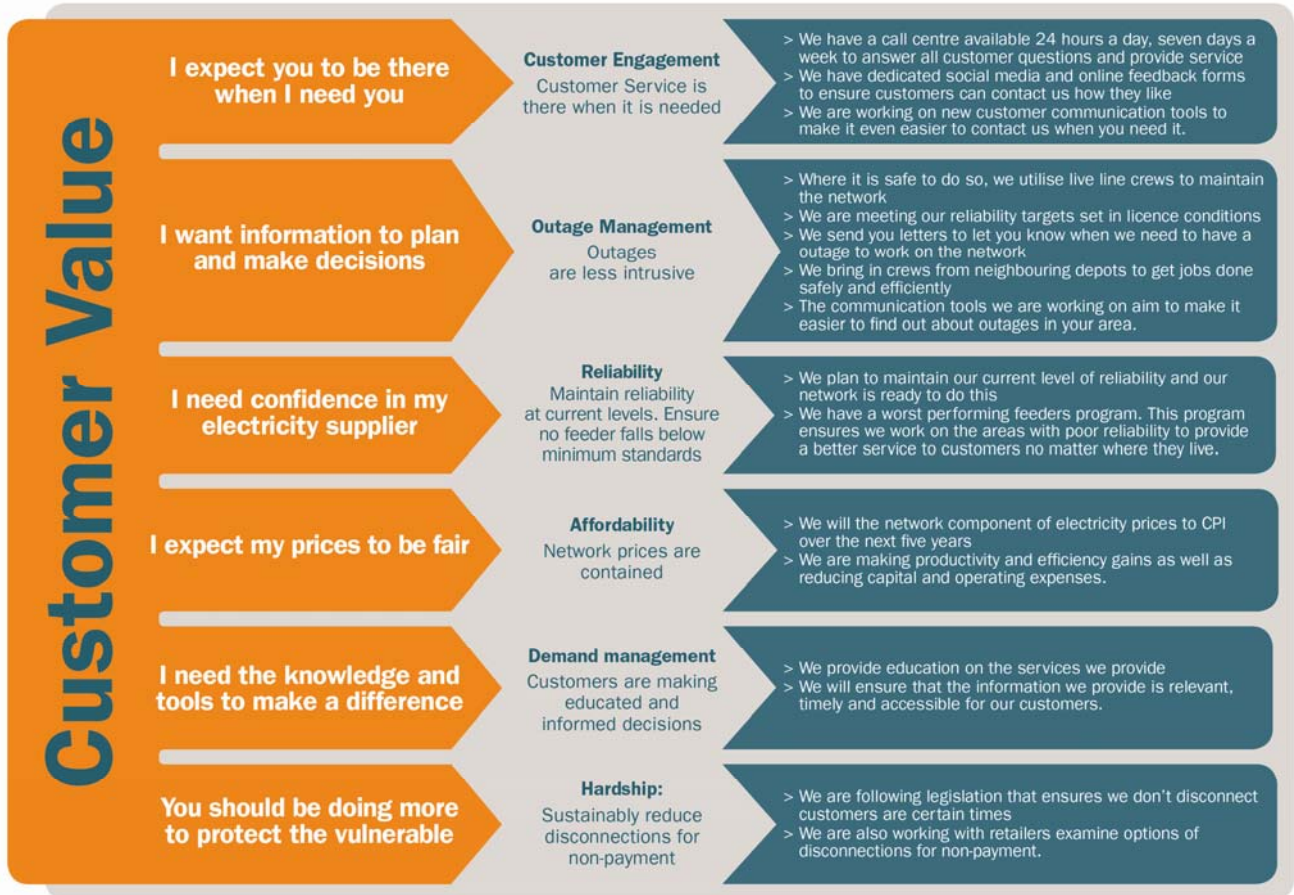


Figure 6 – Areas of Customer Engagement & Corresponding Priorities

Each value provides the following insights into customer objectives with regards to network management:

**Affordability**

*Customers do not fully understand why charges are rising, but accept it as inevitable and out of their control. However, they expect increases in charges to be a genuine result of investment in infrastructure, rather than an attempt to generate profit. Most customers are trying to reduce their electricity bills, and would like more information to help them do so.*

**Response**

Customers expect the network prices to be fair and represent value for money. Essential Energy will strive to contain its share of network prices at or below CPI from 2014 to 2019 through the delivery of a prudent approach to network operations.

Essential Energy has developed an overall expenditure program for the period 2014 to 2019, detailed in the asset management plans and summarised in the NAMP, which provides standard customer services levels at the least life-cycle cost whilst meeting statutory and regulatory requirements and business plan objectives. This expenditure program contains the network tariff increases to CPI for customers, without a material compromise in service levels and safety, and demonstrates Essential Energy's commitment to keep electricity affordable. Public and employee safety will remain paramount in the response strategies and investment program, and Essential Energy's commitment to continuous improvement in safety will not be compromised when making invest decisions.

**Reliability**

*A constant supply of electricity is expected by customers, but current levels of reliability are generally seen as acceptable. For most, a reduction in price would not compensate for reduced reliability. Power interruptions are an inconvenience for most household customers, but for small businesses and some rural customers interruptions can have financial impacts.*

**Response**

Essential Energy understands the role electricity plays in customers' lives and the need for confidence in their electricity supply. Moreover, we understand that there is a threshold where customers find it difficult to see the value of investments. Understanding this 'threshold level' is central to Essential Energy's focus on maintaining reliability at current standards, and taking appropriate action where reliability fall below minimum standards.

Essential Energy's Reliability Strategy (section 6.4) maintains network reliability indices at present levels and addresses only those sections of the network where reliability is below standard. Additionally, the Network Planning Strategy, (section 6.2) ensures adequate network capacity to cater for growth and provides redundancy in supply circuits where required. By applying these strategies and safe operating procedures, Essential Energy manages the risk of unplanned outages and manages service interruptions to minimise outage time.

**Outage Management**

*The provision of clear information about the timing and duration of interruptions makes them more acceptable as it enables planning. It also gives customers more control over their electricity usage and enables changes in patterns of use. A lack of understanding and fear of being overwhelmed with technical information prevents some customers from making informed choices.*

**Response**

Essential Energy will invest in solutions that focus on making outages less intrusive through the provision of timely and accurate outage information, delivered via modern and convenient, reactive and proactive communication channels.

Our investments will allow customers, as much as it is possible, to make informed decisions throughout the outage cycle with access to simple, easy to understand information about the outage and the expected duration of supply interruption.

Network Operations and Customer Response (NOCR) provide a prompt and efficient management of customer calls through the operation of a 24 hour call centre staffed by professional operators who capture outage information from the field staff and coordinating responses to customers. The interactive voice response (IVR) system is also used to notify customers of supply interruptions and restoration progress by providing a simple and informative message to customers phoning the customer response centre during outages.

Additionally, details of planned outages are communicated to effected customers at least 14 days before the scheduled outage and this practice allows customer to make adequate arrangements for the duration of the supply outage.

### **Demand Management**

*Customers place a very high value on being able to control when and how they use and pay for electricity. Very few are willing to sacrifice this control, but many are willing to make changes to their appliances and usage patterns in order to manage the affordability of their electricity.*

### **Response**

The influence of the customer value theme of control has been incorporated in Essential Energy's approach to Demand Management [DM]. Our DM initiatives focus on empowering customers to make educated and informed decisions through technologies, education and easy to use information that encourage customers to make measurable differences. DM initiatives are detailed in the Demand Management Strategy and will be measured through quantifiable customer behavioural changes.

### **Customer Engagement**

*Customers want information exchange between themselves and Essential Energy to be simple. This means communicating via channels that make information available when and where they need it. Mobile technology is a growing part of customers' lives, and they want future communications to reflect this.*

### **Response**

Essential Energy has a rich history of customer and stakeholder engagement through both formal and informal activities such as safety education programs, social media campaigns, customer communications about what we are doing on the network, as well as asking dedicated customer groups what they think about our plans.

During the preparation of our plans for capital and operating expenditure, we increased the depth and range of stakeholder engagement. To formalise our approach to customer engagement, we have developed a Stakeholder Engagement Framework. The framework describes the type of engagement activities customers and stakeholders can expect from the business. It also identifies what we can't do and why. This framework will remain in place with deliverables in terms of research, engagement activities and reporting back to customers over the course of the regulatory control period.

### **Hardship**

*Customers see the need to ensure that vulnerable households have access to a reliable electricity supply. However, there is a concern that programs designed to help vulnerable customers may be exploited by those are not in need of it.*

### **Response**

Essential Energy is a State Owned Corporation (SOC) under schedule 5 of the State Owned Corporations Act 1989, and established by the Energy Services Corporations Act 1995. Under section 8 of the Energy Services Corporations Act 1995, Essential Energy's principal objective with respect to customers is:

- (iii) *Exhibit a sense of social responsibility by having regard to the interests of the community in which it operates.*

Essential Energy appreciates that it does not have the direct financial relationship with customers', however we understand that network prices make up a substantial

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percentage of customer accounts, and in part, contribute to the pressure of genuine hardship and number of Disconnections for Non-Payment (DNPs).

Essential Energy believes that by introducing a hardship program that promotes and incentivises sustainable changes in usage patterns, we can work collaboratively with customers, retailers and stakeholders to achieve the common outcome of avoiding unnecessary DNPs.

- **Delivering the Current Customer Engagement Outcomes**

The findings from stakeholder engagement activities and research support the objectives of the business in terms of providing a safe, reliable and affordable electricity supply to our customers. Customers and stakeholders made it clear they expect the reliability they currently experience to be maintained, however they are not willing to pay more for this. With this in mind, Essential Energy's regulatory proposal is based on a prudent, but safe and efficient approach to network asset management.

Synergies between asset groups and customer requirements are captured at Strategy level (see section 3.2) and this ensures the customers' requirements are met in the most cost effective way.

### **5.3.5 Business Requirements**

Essential Energy's Business Plan guides business performance and corporate outcomes. The Business Plan focuses on safety, reliability and sustainability and containing the average distribution network tariff increases to CPI; chapter 0 details the key outcomes of the business plan.

Section 2.5 sets out the overall asset management objective in terms of the service level obligations and performance targets, which are then linked with, and contribute to, the delivery of Essential Energy's Business Plan. Specific business requirements at asset level are included in the respective asset management plans.

## 6. NETWORK MANAGEMENT STRATEGIES

### 6.1 Introduction

Network management strategies can be defined as the strategies applied to more than one asset group and, in general, apply to all the assets that make up the electrical network required to deliver electricity to customers and to facilitate small power generator connections. The network management strategies outlined in this chapter provide a high level guide or direction for managing network assets whereas specific asset management strategies (detailed in each asset management plan) are targeted at achieving or closing an identified performance gap and maintaining service performance associated with a specific asset type and/or statutory compliance requirement.

### 6.2 Network Planning Strategy

Essential Energy's network planning strategy ensures the network assets can continue to achieve the service level obligations set out in 5.3 at the lowest life cycle cost. The strategic elements of the overall Network Planning strategy are listed below:

- Provide an electricity network that is capable of supplying customer's loads before they connect those loads, including the catering for 'natural' or organic load growth that occurs on the network.
- Forecast where new zone substations and associated sub transmission lines and subtransmission stations (Bulk Supply Points) will be needed or existing facilities augmented.
- Maintain an appropriate quality of supply and level of reliability on the existing network in accordance with the reliability and quality of supply strategies.
- Facilitate preparation of annual and longer term budgets for all the above, that are economically efficient, taking into account both prudent capital investment and on-going asset lifecycle costs.

Underpinning the network planning strategy is a suite of key documents and procedures as detailed below:

The Network Planning Criteria & Guidelines	CEOP8003
Distribution Planning Manual	CEOM7092
Demand Management Strategy	CEOP1121
Network Capital Expenditure	CEOP2008
Standard Overhead Conductor: Current Rating Guide	CEOM7011
Supply Standards: Electricity Supply Standard	CEOP8026
Capital Contributions	CEOP8019
Subtransmission Line Design Manual	CEOM7081
Renewal & Refurbishment Guidelines	CEOM7094
Overhead Design Manual	CEOM7097
Underground Design Manual	CEOM7098
Network Planning: Easement Requirements	CEOP8046
Network Planning: Low Voltage Pole Rebate	CEOF6659
Network Investment Document (NID)	CEOF3013
New Network Asset Report (NNAR)	
Network Options Documents (NOD)	
Planning & Constraint Reports (many documents)	
Electricity System Development Review (ESDR)	

The network planning strategies, actions and activities have been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMPs) and asset management process.



### 6.3 Distribution Growth Strategy

Essential Energy has developed this strategy to instil a systematic and consistent approach to the management of demand and load growth throughout the asset management functions. Consequently, this document provides guidance to, and is a key input for other relevant network strategies, including the Network Asset Management Plan (NAMP) and the supporting Asset Management Plans (AMPs).

The Distribution Growth Strategy (CEOP2091) defines the components that constitute distribution network demand and load growth, the impacts of such peak demand and load growth, and how those components need to be managed. It supports the need for continuing investment for network optimisation, augmentation and the management of growth on Essential Energy's distribution network and is a key input to the Asset Management Plans (AMPs).

This document includes investments for Demand Management initiatives to allow optimisation of distribution network utilisation and to facilitate the deferment or cancellation of some traditional type augmentation projects. Investments have been included for increasing the proactive monitoring capabilities for load and demand growth and voltage performance of the distribution network that will assist in system optimisation and maximising network utilisation. These investments for Demand Management and Network monitoring will allow for the deferral, reduction or cancellation of investments to cater for demand growth on some parts of the network

Underpinning the Distribution Growth strategy is a suite of key documents and procedures as detailed below:

Network Planning Database	
Electricity Supply Standards	CEOP8026
Network Planning Guidelines	CEOP8003
Capital Contribution Policy	CEOP8019
Network Planning: Low Voltage Pole Rebate	CEOF6659
Request for Sundry Invoice - Transformer Upgrades	CEOF6733
Consent Form: Essential Energy Network Funded Project	CEOF9095
Standard Overhead Conductor: Current Rating Guide	CEOM7011
Sub transmission Line: Design Manual	CEOM7081
Distribution Planning: Manual	CEOM7092
Engineering Services: Renewal & Refurbishment Manual	CEOM7094
Overhead Design	CEOM7097
Underground: Design Manual	CEOM7098
Demand Management: Electricity Network	CEOP1121
Network: Capital Expenditure	CEOP2008
Network Project Guidelines: Investment Appraisal & Business Case >\$100000	CEOP2009
Supply of Electricity to New Subdivisions & Site Developments	CEOP2015
Sub transmission: Design Procedure	CEOP2291
Essential Energy: High Voltage Protection Guidelines	CEOP8002
Infrastructure Strategy: Capital Contributions	CEOP8019
Transmission & Zone Substations: Design Guidelines	CEOP8032
Distribution Transformers: Ferro-resonant Overvoltage Risk Limitation	CEOP8044
Network Planning: Easement Requirements	CEOP8046
Sub Transmission and Distribution Network Planning Criteria & Guidelines	CEPG8003
NIEIR Forecast Energy & Demand Report for Essential Energy	

Network Technology (NT) is a concept that encompasses a whole of business/whole of network approach to the delivery of network services. This view of the Network Technology is one of a transformation of our business to leverage communications and information technology advances and overlay these onto the classical power system technologies to progressively enable enhanced network capability, performance, configuration, operations and proactive management of customer service.

The strategic elements of the Network Technology deployment are listed below:

- Stakeholder Engagement Strategy
- Research and Development Strategy
- Field Deployment Strategy
- Business Integration Strategy
- Strategic alignment to Business Plan objectives

In the development and preparation of the Network Technology strategy, every effort has been made to optimise and coordinate the strategies and plans across all relevant documents to achieve the required service levels in the most efficient manner practical in Essential Energy's circumstances.

The Distribution Growth Strategy (CEOP2091) provides detail on how the overall initiative is developed, implemented and monitored and has been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMP's) and asset management process.

## **6.4 Reliability Strategy**

The primary purpose of the reliability strategy is to comply with network reliability indices and requirements stipulated in the Design, Reliability & Performance Licence Conditions issued in October 2007 by the Minister for Energy. To comply with these requirements, Essential Energy's has established the following strategic approaches to manage network reliability:

- A Reliability management framework
- Individual Feeder Standards management
- Worst performing feeder segment management
- Avoiding financial penalty under the Service Target Performance Incentive Scheme (STPIS) proposed by the Australian Energy Regulator.

These strategies are based on the following assumptions:

- No significant change in the NSW licence conditions or changes in the reliability targets set in the licence conditions.
- STPIS reliability targets are achievable within reasonable levels of expenditure.
- An operating paradigm where worst served customer performance is expected to be addressed in a financially prudent manner.

Network Reliability Strategy 2009-2019 (CEOP2463) provides details on how the overall reliability strategy is developed, implemented and monitored. The reliability strategy has been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMP's) and asset management process.

## 6.5 Power Quality Strategy

The primary purpose of the Power Quality strategy is to provide direction across the business' asset management functions to ensure compliance with the standards and regulations stipulated in Electricity Supply Standard (CEOP8026) over the 2014/15-2018/19 period. The scope of this strategy covers measurement, monitoring, maintenance and improvement of power quality across Essential Energy's distribution network. At present, it does not address or apply to the subtransmission network or its associated assets.

The strategic elements of the overall Power Quality strategy listed below:

### Reactive Measures (short to medium term)

- Customer complaints are investigated
- Temporary monitoring is used to investigate complaints
- Alternate solutions are investigated and assessed
- Targeted solutions are implemented
- Customers are advised of outcomes
- Post implementation reviews are undertaken to assess effectiveness

### Proactive Measures (medium to longer term)

- Progress towards proactive power quality management practices
- Reduce the maximum voltage limit
- HV feeder voltage profiles are managed
- New or additional load impacts are managed
- Reliance is placed on network asset management practices
- Network PQ performance is monitored
- Strategic outcomes are evaluated and built upon

### SWER Network Initiatives

- Electronic meters with Power Quality functionality are installed and monitored at SWER line peripheries
- SWER is systematically modelled and reviewed

Power Quality Strategy (CEOP2090) provides details on how the overall power quality strategy is implemented and monitored. The power quality strategy has been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMP's) and asset management process.

## 6.6 Bushfire Prevention Strategy

Essential Energy has developed and implemented several strategies to prevent or minimise the occurrence of fire ignition from electrical assets. The following strategic elements are those relating more specifically to bushfire prevention even though many others exist which may have an indirect relationship. Bushfire prevention strategies include:

- Undertake asset inspection and maintenance in a prioritised manner with a focus on high fire risk areas, and ensure fire start risks are identified and actioned.

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- Undertake vegetation management in the form of tree cutting and clearing to minimise the risk of trees or vegetation coming into contact with live lines or equipment and igniting fires.
- Provide advice and information to owners of private lines to inform them of fire risks on their lines and to make recommendations on risk control actions.
- Institute operational limitations on total fire ban days to minimise the risk of lines or equipment inadvertently starting a bushfire.
- Identify high bushfire risk zones to ensure operations and maintenance activities are undertaken with an increased awareness of bushfire start risk.
- Analyse fire starts proven to be caused by electrical equipment and undertake root cause analysis to identify control or prevention measures that can be instituted or developed.

Network Management Plan Chapter 4: Bush Fire Risk Management Plan (CEOP8022) provides details of how the bushfire prevention strategies are practised and monitored. Section 4.3 of Bushfire Prevention and Survival (CECM1000.13) details activities and actions aimed to prevent the initiation and spread of bushfires.

These strategies have been developed to align with the Business Plan, Network Vision 2025 and provide an input to the Asset Management Plans (AMP's) and asset management process.

## **6.7 Environmental Management Strategy**

The environmental management strategy applicable to Essential Energy's network assets seeks to ensure that the business continues to operate the assets in accordance with stakeholder environmental requirements and relevant environmental regulations, while minimising the overall life-cycle costs. To achieve this outcome Essential Energy employs an environmental compliance strategy, which consists of the following strategic elements:

- Environmental risk is monitored and assessed.
- Environmental management is included in the asset management process and complies with the Safety, Health and Environmental Manual.

Essential Energy's overall environmental management strategies are detailed in several sections of the comprehensive Safety, Health and Environmental Manual (SHE Manual CECM1000). The key sections of the manual specific to environmental management are listed below:

SHE Manual: Environmental Impact Assessment – NSW	CECM1000.70
SHE Manual: Environmental Impact Assessment – QLD	CECM1000.71
SHE Manual: Air	CECM1000.72
SHE Manual: Water	CECM1000.73
SHE Manual: Noise	CECM1000.74
SHE Manual: Waste	CECM1000.75
SHE Manual: Land Use	CECM1000.76
SHE Manual: Flora and Fauna	CECM1000.77
SHE Manual: Community Consultation & Interaction	CECM1000.78
SHE Manual: Cultural and Heritage	CECM1000.79
SHE Manual: Resource Conservation	CECM1000.80
SHE Manual: Pesticide Notification Plan	CECM1000.81

These documents provide wide-ranging actions and activities with associated controls, monitoring and reporting procedures to ensure compliance with numerous environmental regulations and laws listed in the reference section of the relevant SHE manual.

These strategies, actions and activities have been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMPs) and asset management process.

## **6.8 Refurbishment Strategy**

Essential Energy's refurbishment strategy seeks to ensure the network asset continue to achieve the service level obligations set out in 5.3, while minimising the total life-cycle cost by ensuring the efficient and optimal replacement timing of these assets. The refurbishment strategic elements are set out below:

- Refurbishment need is established through inspection and condition based risk analysis
- Refurbishment timing is planned and executed to minimise network risk and to achieve expenditure smoothing
- Refurbishment decisions consider root-cause analysis results

Underpinning the refurbishment strategies is a suite of key documents and procedures as below:

### Key refurbishment documents

Engineering Services: Renewal & Refurbishment Manual	CEOM7094
Asset Refurbishment Strategy: Zone Substations	CEOP2245
Refurbishment / Replacement Guideline: SCADA and Load Control	CEOP2420
Public Lighting: Management Plan 2010	CEOP1023
Zone Substation: Transformer Refurbishment Specification	CEOF6488
Metering Services: Network standard Metering	CEOP8027
Power and Regulating Transformer Major Maintenance and Capital Refurbishment field report	CEOF6344

Each asset management plan also identifies specific refurbishment activities and tasks required to ensure assets continue to achieve service level obligations.

The refurbishment strategies, actions and activities have been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMPs) and asset management process.

## **6.9 Maintenance Strategy**

Essential Energy's maintenance strategy seeks to ensure that the network assets continue to achieve the service level obligations set out in 5.3, while minimising the total life-cycle cost through effective maintenance practices that achieve the productive life of network assets within the business' risk tolerance. To achieve this outcome Essential Energy uses a maintenance strategy that consists of the following strategic elements:

- Asset condition is actively monitored through inspection and defect prioritisation.
- Testing, preventative and corrective maintenance activities are employed
- Asset data is captured through maintenance practices
- Essential spare parts are actively managed
- Risk-based techniques are employed to prioritise maintenance activities
- Total life-cycle costs of asset ownership are minimised through Opex/Capex trade-off and prioritisation of works.

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Underpinning the maintenance strategies is a suite of key documents and procedures as detailed below:

Key maintenance documents

Mains and Distribution field equipment maintenance	CEOP8007
Sub-Transmission & Zone Substation: Maintenance	CEOP8011
Distribution Substation & Switchgear maintenance	CEOP8009
Zone Substation: Field WORK Manual & General information	CEOM7772
Zone Substation Inspection and Maintenance	CEOM7773
Zone Substation: Reference Index for ZS activities	CEOM7776
Zone Substation Technical Guidelines (Parts 1 – 3)	CEOM7774
Zone Substation: Technical Instructions & Manuals Catalogue	CEOM7775
Metering Services Manual	CEOM8014
Asset Inspection: Critical Distribution Equipment	CEOP2034
Electricity Network Asset Inspection	CEOP8010
Asset Inspection Manual	CEOM7005

Each asset management plan also identifies specific maintenance activities and tasks required to ensure assets continue to achieve service level obligations.

The maintenance strategies, actions and activities have been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMPs) and asset management process.

**6.10 Operating Strategy**

The operating strategy applicable to Essential Energy's network assets seeks to enable achievement of the service level obligations set out in 5.3 while minimising the overall life-cycle costs, through active risk management and operational practices that maintain compliance with design parameters. To achieve this outcome Essential Energy employs an operating strategy that consists of the following strategic elements:

- Asset availability is proactively managed
- Operational risk is understood and managed
- Operation is aided by engineered protective measures and monitoring
- Assets are operated within design parameters
- Operational resources are strategically deployed
- Guaranteed service levels payments

Underpinning the operating strategy is a suite of key documents and procedures as detailed below:

Key Operational documents

Operating agreement	CEOF6052
Switching request and planned outage notification	CEOP2056
System alteration notification	CEOP2057
Emergency communication	CEOP2060
Manual reclosing of overhead lines	CEOP2062
Access permit	CEOP2045
Authority for placing major electrical plant/equipment into service	CEOP2047
Low voltage back feed	CEOP2050
High voltage live line work operational requirements	CEOP2061
Switching Log	CEOF6397
Zone Substation: Emergency Response Plan	CEOP2153
Operational Manual (many documents)	CEOM7047

Each asset management plan also identifies specific operating activities and tasks undertaken to ensure assets continue to achieve service level obligations.

The operational strategies, actions and activities have been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMPs) and asset management process.

### **6.11 Asset Disposal Strategy**

Essential Energy's network assets disposal strategy seeks to ensure that the environmental impact of asset disposal is minimised, while any remaining value is maximised. The elements of this disposal strategy are set out below.

- Environmental hazards are identified and managed
- Useful parts are recovered
- Disposal value is maximised

Corporate disposal procedure - CEOP8074 guides and facilitates the overall network asset disposal strategy.

Each asset management plan also identifies specific disposal activities and tasks undertaken to ensure compliance with CEOP8074 and industry related documents.

The disposal strategies, actions and activities have been developed to align with the Business Plan, Network Vision 2025, and provide an input to the Asset Management Plans (AMPs) and asset management process.

### **6.12 Delivering the Network Management Strategies**

The network management strategies outlined in above are general in nature and provide a sound bases for the specific asset management strategies further developed and detailed in each asset management plan, where details and expenditure are determined, optimised and justified.

Delivery of the strategies is achieved through the successful completion of the identified, justified and approved projects and programs of work detailed in the AMPs. The delivery of the projects and on-going programs is undertaken by Network Operations, Engineering, Network Development and accredited service providers and external contractors.

Underpinning the delivery process is a suite of key documents and procedures as detailed below:

#### Project Management and Contract Management documents

Project Management Process Flow Chart	CEOM7250.02
Project Process Flow Chart - Summary Flow Charts	CEOM7250.03
Project Management	CEOP1068
Contract Management	CEOM7050.23
Standard Project Management Forms (many)	CEOF6689

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**7. INVESTMENT PLANS**

**7.1 Introduction**

Capital expenditure (Capex) is defined as expenditure that is incurred to satisfy one or more of the following:

- Purchase or construction of a new asset;
- Increase the functionality of the asset; or
- Extend the service life of the asset.

The fundamental objective of optimised Capex is to expand or renew the network so that performance is maintained in order to provide customers with quality, safe and reliable network services, at the lowest possible price, while preserving the value of public assets in a sustainable way. This fundamental objective is achieved through the delivery of the asset management plan projects and programs of work which are consolidated into the Capital Investment Plans with sub categories as defined in Figure 7.

Operational expenditure (Opex) is defined as expenditure required to operate and maintain the provision of network services. In the context of asset management, the maintenance expenditure required to keep the assets in good working order and to maintain service potential is captured in the asset management plans.

The network operating expenditure, associated with operating the business, network control and safe access and other related operational activities, are not captured in the asset management plans, but is included the Operation Investment Plan to ensure all Opex is captured in the NAMP. See section 7.4 for details of the Operating Investment Plan.

All financial data presented in the NAMP is based on real, 2013 dollars. To project actual expenditure in a given year, adjustments must be made for factors such as inflation and expected labour, material and foreign exchange movements, where applicable; however these adjustments are not included in the figures presented in this document.

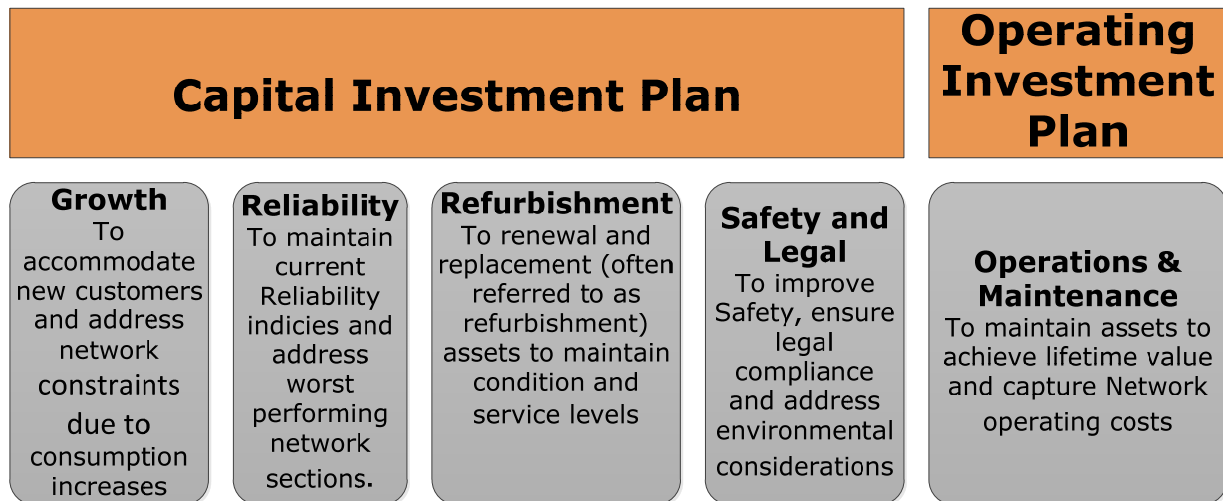


Figure 7 – Essential Energy’s Investment Groupings



## 7.2 Capital Investment Plan

### 7.2.1 Growth

The growth expenditure component of the Capital Investment Plan includes the projects and programs of work required to address the augmentation of network capacity to meet demand within an acceptable risk profile. This expenditure is generally driven by new customer connections and expenditure required to augment the network resulting from changes to, or forecast changes to, the existing pattern or profile of demand.

The asset management plans detail specific projects and programs of work related to demand and network augmentation and Table 7 summarise the overall demand related expenditure required to augment the network and connect new customers.

<b>Asset Management Plans (\$ M 2013)</b>	<b>2014/ 15</b>	<b>2015/ 16</b>	<b>2016/ 17</b>	<b>2017/ 18</b>	<b>2018/ 19</b>
Distribution O/H feeders	\$43.5	\$44.5	\$48.1	\$47.5	\$46.7
Customer Connections	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2
Distribution Substations	\$9.2	\$9.2	\$10.4	\$10.2	\$9.8
Network U/G Systems	\$8.9	\$7.3	\$7.2	\$7.1	\$6.9
Subtransmission O/H Lines	\$32.6	\$29.1	\$6.7	\$13.8	\$0.3
Telecommunications	\$0.8	\$0.7	\$1.9	\$1.9	\$2.0
Load Control Equipment	\$1.4	\$0.8	\$1.1	\$1.1	\$1.3
SCADA & DSA Equipment	\$2.6	\$2.6	\$2.3	\$2.4	\$2.5
Generation (regulated only)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Subtransmission Transformers	\$2.5	\$1.3	\$0.0	\$0.0	\$0.6
Subtransmission Equipment	\$24.3	\$11.3	\$10.4	\$1.8	\$10.3
Metering - Network	\$0.4	\$0.4	\$0.4	\$0.4	\$0.4
<b>Total Standard Control CAPEX</b>	<b>\$126.4</b>	<b>\$107.3</b>	<b>\$88.7</b>	<b>\$86.4</b>	<b>\$81.2</b>
Metering - Customer	\$2.5	\$2.4	\$5.0	\$2.4	\$2.4
Public Lighting	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<b>Total Alternative Control CAPEX</b>	<b>\$2.5</b>	<b>\$2.4</b>	<b>\$5.0</b>	<b>\$2.4</b>	<b>\$2.4</b>

**Table 7 – Growth Related Expenditure per Asset Group**

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**7.2.2 Reliability**

The Capital Investment Plan includes Reliability related expenditure with the primary purpose of maintaining network reliability and includes associated quality of supply requirements. Reliability and quality of supply requirements are defined in each asset management plan based on the relevant Strategy documents, Reliability Strategy (CEOP2463) and Power Quality Strategy (CEOP2090) and distribution network service provider's licence conditions summarised in section 5.3.2.

Table 8 summarise the overall expenditure required to meet reliability licence and design criteria and quality of supply requirements.

<b>Asset Management Plans (\$ M 2013)</b>	<b>2014/ 15</b>	<b>2015/ 16</b>	<b>2016/ 17</b>	<b>2017/ 18</b>	<b>2018/ 19</b>
Distribution O/H feeders	\$21.7	\$22.2	\$22.2	\$22.2	\$22.2
Customer Connections	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Distribution Substations	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Network U/G Systems	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Subtransmission O/H Lines	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Telecommunications	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Load Control Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
SCADA & DSA Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Generation (regulated only)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Subtransmission Transformers	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Subtransmission Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Metering - Network	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<b>Standard Control CAPEX total</b>	<b>\$21.7</b>	<b>\$22.2</b>	<b>\$22.2</b>	<b>\$22.2</b>	<b>\$22.2</b>
Metering - Customer	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Lighting	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<b>Alternative Control CAPEX total</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>

**Table 8 – Reliability Related Expenditure per Asset Group**

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**7.2.3 Refurbishment**

The refurbishment expenditure component of the Capital Investment Plan relates to asset renewal and replacement (often referred to as refurbishment) directly resulting from the need to maintain the functionality of the existing asset base, irrespective of changes to the pattern or profile of demand. This may relate to expenditure driven by the age, condition, technology or the operating environment of the existing assets, and the imposition such matters may have on maintaining reliability levels and compliance with power quality, safety and environmental obligations.

Table 9 summarise the overall expenditure required to refurbish assets as determined by the asset management processes undertaken in each AMPs.

<b>Asset Management Plans (\$ M2013)</b>	<b>2014/1 5</b>	<b>2015/1 6</b>	<b>2016/1 7</b>	<b>2017/1 8</b>	<b>2018/1 9</b>
Distribution O/H feeders	\$73.9	\$77.6	\$79.8	\$82.4	\$84.5
Customer Connections	\$3.1	\$6.2	\$7.3	\$7.3	\$7.3
Distribution Substations	\$14.9	\$15.6	\$15.6	\$14.8	\$14.8
Network U/G Systems	\$5.0	\$6.9	\$9.1	\$7.5	\$6.9
Subtransmission O/H Lines	\$16.8	\$12.8	\$16.3	\$21.1	\$19.0
Telecommunications	\$5.6	\$4.2	\$4.8	\$3.1	\$3.1
Load Control Equipment	\$3.1	\$3.1	\$3.0	\$3.0	\$3.0
SCADA & DSA Equipment	\$1.2	\$1.2	\$1.2	\$1.2	\$1.2
Generation (regulated only)	\$0.9	\$0.2	\$0.1	\$0.0	\$0.1
Subtransmission Transformers	\$7.8	\$8.4	\$10.3	\$9.3	\$11.1
Subtransmission Equipment	\$19.9	\$24.9	\$28.3	\$18.7	\$17.9
Metering - Network	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<b>Total Standard Control CAPEX</b>	<b>\$152.3</b>	<b>\$161.1</b>	<b>\$175.8</b>	<b>\$168.4</b>	<b>\$168.9</b>
Metering - Customer	\$3.9	\$5.4	\$5.6	\$7.6	\$7.5
Public Lighting	\$4.3	\$2.9	\$3.0	\$3.1	\$3.1
<b>Total Alternative Control CAPEX</b>	<b>\$8.2</b>	<b>\$8.3</b>	<b>\$8.6</b>	<b>\$10.7</b>	<b>\$10.6</b>

**Table 9 – Refurbishment Related Expenditure per Asset Group**

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The safety, environmental and regulatory expenditure, the primary purpose of which is to meet a regulatory obligation or requirement, is also a component of the Capital Investment Plan. The associated expenditure is detailed in each individual asset management plan and Table 10 summarise the overall expenditure required to meet safety, environmental and regulatory requirements and deliver continuous improvement in safety.

<b>Asset Management Plans (\$ M 2013)</b>	<b>2014/ 15</b>	<b>2015/ 16</b>	<b>2016/ 17</b>	<b>2017/ 18</b>	<b>2018/ 19</b>
Distribution O/H feeders	\$7.6	\$12.3	\$12.3	\$12.3	\$12.3
Customer Connections	\$4.8	\$4.8	\$4.8	\$4.8	\$4.8
Distribution Substations	\$0.8	\$1.2	\$1.0	\$1.0	\$0.9
Network U/G Systems	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5
Subtransmission O/H Lines	\$0.3	\$0.6	\$0.6	\$0.6	\$0.6
Telecommunications	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Load Control Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
SCADA & DSA Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Generation (regulated only)	\$0.2	\$0.0	\$0.2	\$0.0	\$0.2
Subtransmission Transformers	\$1.0	\$1.0	\$0.0	\$0.0	\$0.0
Subtransmission Equipment	\$3.6	\$3.6	\$3.5	\$3.5	\$3.5
Metering – Network	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Customer Service	\$0	\$0.3	\$3.2	\$3.2	\$3.2
<b>Total Standard Control CAPEX</b>	<b>\$18.9</b>	<b>\$24.4</b>	<b>\$26.1</b>	<b>\$26.0</b>	<b>\$26.1</b>
Metering - Customer	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Lighting	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<b>Total Alternative Control CAPEX</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>

**Table 10 – Safety and Legal related Expenditure per Asset Group**

### 7.3 Capital Expenditure Summary

Asset Management Plans (\$ M 2013)	2014/ 15	2015/ 16	2016/ 17	2017/ 18	2018/ 19
Distribution O/H feeders	\$146.7	\$156.6	\$162.4	\$164.5	\$165.7
Customer Connections	\$8.1	\$11.2	\$12.2	\$12.2	\$12.2
Distribution Substations	\$24.9	\$26.0	\$26.9	\$26.0	\$25.6
Network U/G Systems	\$14.4	\$14.8	\$16.9	\$15.2	\$14.4
Subtransmission O/H Lines	\$49.7	\$42.6	\$23.7	\$35.4	\$19.9
Telecommunications	\$6.4	\$4.8	\$6.7	\$5.0	\$5.1
Load Control Equipment	\$4.6	\$3.9	\$4.1	\$4.1	\$4.3
SCADA & DSA Equipment	\$3.8	\$3.8	\$3.6	\$3.7	\$ 3.8
Generation (regulated only)	\$1.1	\$0.2	\$0.3	\$0.0	\$0.3
Subtransmission Transformers	\$11.3	\$10.6	\$10.3	\$9.3	\$11.7
Subtransmission Equipment	\$47.9	\$39.8	\$42.1	\$23.9	\$31.7
Metering - Network	\$0.4	\$0.4	\$0.4	\$0.4	\$0.4
Customer Service <sup>10</sup>	\$0.0	\$0.3	\$3.2	\$3.2	\$3.2
<b>Total Standard Control CAPEX</b>	<b>\$319.3</b>	<b>\$315.0</b>	<b>\$312.8</b>	<b>\$302.9</b>	<b>\$298.4</b>
Metering - Customer	\$6.5	\$7.9	\$10.6	\$10.0	\$9.9
Public Lighting	\$4.3	\$2.9	\$3.0	\$3.1	\$3.1
<b>Total Alternative Control CAPEX</b>	<b>\$10.8</b>	<b>\$10.8</b>	<b>\$13.6</b>	<b>\$13.1</b>	<b>\$13.0</b>

**Table 11 – Total Capital Expenditure per AMP**

Expenditure Category (\$ M 2013)	2014/1 5	2015/1 6	2016/1 7	2017/1 8	2018/1 9
Growth	\$128.9	\$109.7	\$93.7	\$88.8	\$83.6
Asset Renewal or Replacement	\$160.6	\$169.5	\$184.4	\$179.1	\$179.5
Reliability & Quality of Service Enhancements	\$21.7	\$22.2	\$22.2	\$22.2	\$22.2
Environmental, Safety, Statutory Obligations	\$18.9	\$24.4	\$26.1	\$25.9	\$26.0
<b>Total Standard &amp; Alternative Control CAPEX</b>	<b>\$330.0</b>	<b>\$325.8</b>	<b>\$326.4</b>	<b>\$316.0</b>	<b>\$311.4</b>

**Table 12 – Total Capital Expenditure per Driver**

<sup>10</sup> Customer Service CAPEX relates to specific projects and programs of work targeted at improving customer service.

## 7.4 Operating Investment Plan

### Overview

The Operating Investment Plan includes two main expenditure streams, as described in section 7.1 and listed below:

- Maintenance expenditure related to asset maintenance to keep the assets in good working order and to maintain service potential; and
- Operating expenditure related to, Network Control rooms, System Ops, SIG group and general operational expenses associated with the network.

The maintenance expenditure is captured in each individual Asset Management Plan and consolidated in Table 13.

Operating expenditure required to control the network along with other operational expenditure associated with providing the controlled services are also captured in Table 13.

<b>Standard Control Services</b>	<b>2014/15</b>	<b>2015/16</b>	<b>2016/17</b>	<b>2017/18</b>	<b>2018/19</b>
<b>Network Operating Costs</b>	<b>\$1.1</b>	<b>\$1.1</b>	<b>\$1.1</b>	<b>\$1.1</b>	<b>\$1.1</b>
<b>Network Maintenance</b>	<b>\$260.5</b>	<b>\$254.4</b>	<b>\$245.3</b>	<b>\$244.9</b>	<b>\$244.6</b>
- Inspection	\$22.2	\$22.2	\$22.2	\$22.2	\$22.2
- Maintenance & repair	\$53.9	\$53.9	\$53.9	\$53.9	\$53.9
- Vegetation Management	\$112.9	\$106.7	\$97.6	\$97.2	\$97.0
- Emergency Response	\$54.6	\$54.6	\$54.6	\$54.6	\$54.6
- Other network maintenance costs	\$16.9	\$16.9	\$16.9	\$16.9	\$16.9
<b>Other Operating Costs</b>	<b>\$27.3</b>	<b>\$27.3</b>	<b>\$27.3</b>	<b>\$27.3</b>	<b>\$27.3</b>
- Meter reading	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
- Customer service	\$13.5	\$13.5	\$13.5	\$13.5	\$13.5
- Other operating expenses	\$13.8	\$13.8	\$13.8	\$13.8	\$13.8
<b>TOTAL STANDARD CONTROL SERVICES</b>	<b>\$288.9</b>	<b>\$282.8</b>	<b>\$273.7</b>	<b>\$273.3</b>	<b>\$273.0</b>
<b>ALTERNATIVE CONTROL SERVICES</b>					
Public lighting	\$11.1	\$11.2	\$11.3	\$11.4	\$11.5
Ancillary Network Services	\$19.4	\$19.4	\$20.6	\$19.4	\$19.4
Metering	\$17.1	\$17.4	\$17.4	\$17.4	\$17.4
<b>TOTAL ALTERNATIVE CONTROL SERVICES</b>	<b>\$47.6</b>	<b>\$48.0</b>	<b>\$49.3</b>	<b>\$48.1</b>	<b>\$48.3</b>

**Table 13 – Operational Expenditure Plan**

## 8. IMPROVING ASSET MANAGEMENT

In the following sections consideration is given to the aspects of the business-wide asset management practices that support monitoring and improvement of asset management. This includes consideration of how Essential Energy's asset management practices supports and enables the *Plan-Do-Check-Act* (PDCA) cycle around management of the asset's performance and the business' asset management practice.

One of the fundamental principles of asset management is to continually improve network performance, and this principle is also applicable to the asset management system. This section outlines the development and improvements envisaged for the asset management system, NAMP and associated individual asset management plans.

### 8.1 Business-wide Asset Management

Section 3 provides an overview of the key systems that support Essential Energy's asset management practices. These systems, and the related asset management processes, provide the essential asset information that enables the business to monitor and assess the performance of its assets and asset management practices.

In 2011, Essential Energy created the position of Project Director, Asset Management Systems Improvement in order to drive the process of asset management improvement across the business. As part of that process, Essential Energy engaged an asset management consultant to undertake a gap assessment of the business asset management practices and identify areas for improvement. This review resulted in Essential Energy recognising the need to focus on the development of its asset management systems as a core enabler of sound asset management practice, and this has led to the proposed implementation of a new Asset Information System (AIS).

Essential Energy has also implemented a number of other mechanisms which help drive improvement in asset management outcomes across the business. These include:

- A Continuous Business Improvement group
- A Better Policies group
- A Capital Governance group
- The TotalSAFE incident reporting system
- A business performance dashboard which monitors all relevant Key Performance Indicators

### 8.2 Quality management

Essential Energy operates within an overall management framework that generally aligns with the principles of ISO 9001:2008 and the business has a commitment to the tenets of effective quality management, including:

- Customer focus
- Leadership
- Involvement of people
- Process approach
- System approach to management
- Continual improvement
- Factual approach to decision making
- Mutually beneficial supplier arrangements

The asset management practices set out in this NAMP align with and demonstrate these principles.

### 8.3 Asset Information

Essential Energy employs a condition based risk assessment methodology to optimise the management of network assets against the required service levels detailed in the AMPs. To undertake this assessment, performance, condition and operational information is collated and analysed. The sources of this information currently include CENIC, ENMAC, WASP, Primavera, TotalSAFE, and the planning database as well as information gathered through various reports, MWL's, EWL's and field staff feedback.

The information gathered in this manner enables the ongoing monitoring, review and management of the network assets' performance. Trend, variance and causal analysis are used to target action to mitigate or resolve the performance of network asset classes. The cycle of review and revision associated with this practice is discussed further in the following section.

### 8.4 Cycle of Review & Revision

Figure 8 outlines the *Plan-Do-Check-Act* (PDCA) cycle from an asset management perspective and this diagram is based on PAS 55 principles. Essential Energy recognises the importance of proactive monitoring and feedback in achieving and maintaining the performance of its assets and its asset management practices, and is committed to this cycle of review.

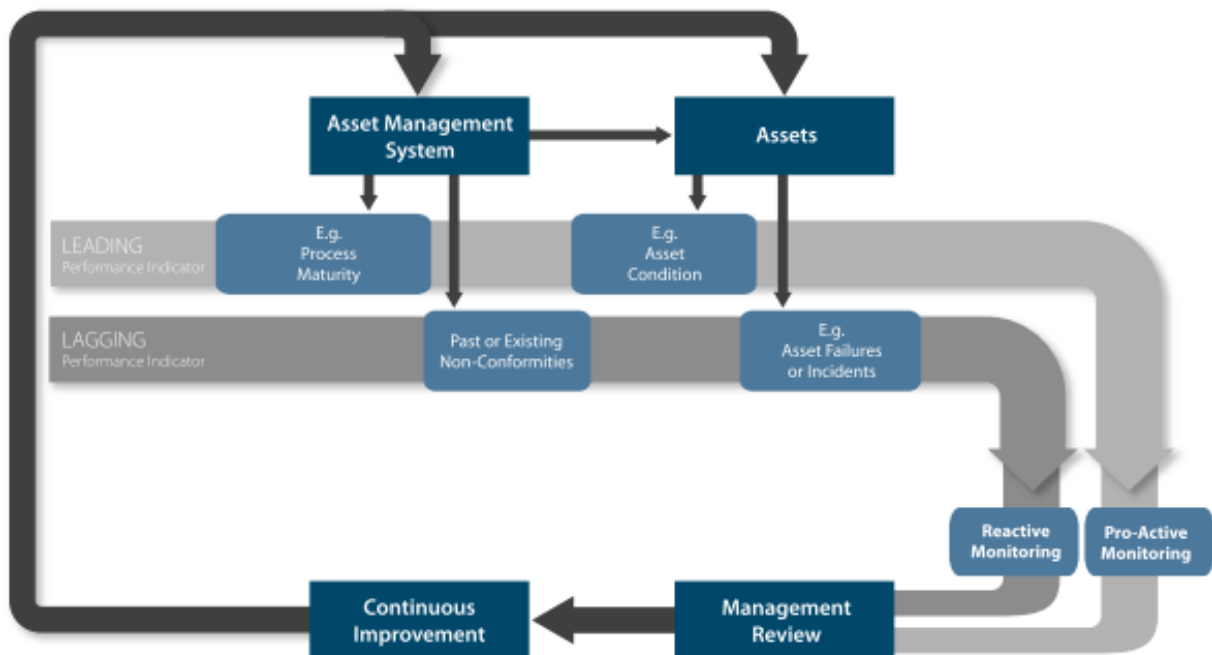


Figure 8 – The Cycle of Monitoring, Review & Revision<sup>11</sup>

As can be seen from figure 8, this cycle of review captures a broad strategic approach that acts on both the assets and the system of asset management that manages the ongoing performance of the assets under management.

<sup>11</sup> © Institute of Asset Management 2011 (UK).



Essential Energy's engineering team also recognises that understanding whether the network assets are operating in a manner which is delivering service potential in excess of its service obligations is just as important as an understanding of performance shortfalls. Clearly a small amount of performance 'headroom' is required to ensure performance requirements are met. Monitoring and minimising this 'headroom' and managing the network assets to achieve the Business Plan objective are the focus of this asset management activity.

## **8.5 Asset Management System**

The lack of a formal and comprehensive AM system impacts on the management of data, metrics, expenditure and AM activities and causal analysis. To improve the overall asset management process, an enterprise asset management will be considered.

## **8.6 Asset Management Training**

A fundamental requirement of any process or activity to be performed successfully is to have sufficient skills and knowledge to perform the tasks. Formal and internal asset management training will be developed through attending accredited asset management courses and internal mentorship.

## **8.7 Asset Management Improvement Initiatives**

A fundamental principle of good asset management (see section 2.3) is the continual improvement and learning from experiences, to this end the following main asset management improvements initiatives will be considered to:

- Develop an asset management vision statement that defines clear priorities and achievable outcomes.
- Clarify roles and responsibilities with respect to developing AMPs and appoint a dedicated project manager with appropriate authority to manage the AMP production process.
- Identify all sources of data required to support asset management decisions. This initiative is expected to require the establishment of a multi discipline group, senior manager sponsorship and regular meetings.
- Identify asset management subject matter experts and further develop AM skills through targeted AM courses, seminars and/or conferences.
- Establish an asset management working committee, sponsored by a senior manager, to direct and influence the asset management process.
- Develop an AM intranet web page and include a range of AM documents, AM tools, document templates, guides and contact details of subject matter experts. This initiative is expected to increase AM awareness and facilitate improved AMP communication and information/data quality.
- Develop an AM body of knowledge with key definitions and easily understood interpretations of the AM terminology.
- Develop the structure and high level specifications for a network risk management system to quantify network risks on a common basis.
- Develop a condition based risk management (CBRM) systems for specific assets or asset groups.

**COMMERCIAL-IN-CONFIDENCE****9. ABBREVIATIONS, KEY TERMS AND DEFINITIONS****9.1 Abbreviations**

AM	Asset Management
AMF	Asset Management Framework
AER	Australian Energy Regulator
AIS	Asset Information System (WASP for Essential Energy)
AMP	Asset Management Plan
AMS	Asset Management System
CAPEX	Capital Expenditure
CENIC	Essential Energy's Network Information Centre
CIS	Customer Information System
DAIS	Distribution Asset Inspection System
DMS	Distribution Management System
DNP	Disconnections for Non-Payment
DNSP	Distribution Network Service Provider
EE	Essential Energy
GIS	Geographical Information System
HR	Human Resources
NT	Network Technology
IPART	Independent Pricing and Regulatory Tribunal
IT	Information Technology
KPI	Key Performance Indicator
LTIFR	Lost Time Injure Frequency Rate
NAMP	Network Asset Management Plan
NEM	National Electricity Market
NER	National Electricity Rules
NSW	New South Wales
OH&S	Occupational Health and Safety
OPEX	Operating Expenditure
PAS	(55:2008) Publicity Available Specification for optimised Asset Management
PDCA	<i>Plan-Do-Check-Act</i> (PDCA) process
PowerOn	Essential Energy's SCADA system
QLD	Queensland
SCADA	System Control and Data Acquisition
SCI	Statement of Corporate Intent
SOC	State Owned Corporation
SWER	Single Wire Earth Return
TAM	Total Asset Management
WASP	Works Assets Solutions & People

**COMMERCIAL-IN-CONFIDENCE****9.2 Key Terms & Definitions****Asset Management** (PAS 55 definition)

- The systematic and coordinated activities and practices through which an organisation optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditure over their life cycle for the purpose of achieving its organisational strategic plan, and a simplified definition from the Asset Management Council:

'Lifecycle management of physical assets to achieve the stated outputs of the organisation'

**Asset Management Policy** (PAS 55 definition)

- Principles and mandated requirements derived from and consistent with the organisational strategic plan, providing a framework for the development and implementation of the asset management strategy and objectives.

**Asset Management Strategy** (PAS 55 definition)

- Long-term optimised approach for the management of assets, derived from, and consistent with, the organisations strategic plan and asset management policy.

**NOTE 1:** The asset management strategy converts the objectives of the organizational strategic plan and the asset management policy into a high-level, long-term action plan for the assets and/or asset system(s),

**NOTE 2:** The high-level, long-term action plans for the assets and the asset management objectives are normally the outputs of the asset management strategy. These elements together form the basis for developing more specific and detailed asset management plan(s).

**Asset Management Objectives** (PAS 55 definition)

- Specified and measurable outcome or achievement required of the asset systems in order to implement the asset management policy and strategy and/or
- Detailed and measurable level of performance or condition required of the assets; and/or
- Specific and measurable outcome or achievement required of the asset management system.

**Asset Management Plan** (PAS 55 definition)

- Document specifying activities and resources, responsibilities and timescales for implementing the asset management strategy and deliver the asset management objectives
- A **policy** typically describes the mandated objectives and requirements used to guide decisions and achieve rational outcome(s).
- A strategy is a plan of action designed to achieve a particular goal or objective.
- An objective is a projected state of affairs that a person or a system plans or intends to achieve.
- An **activity** is a task or action that is undertaken to achieve a specific outcome.
- A **guideline** is any document that aims to streamline particular processes according to a set routine. By definition, following a guideline is never mandatory (protocol would be a better term for a mandatory procedure).

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- A **procedure** is a specified series of actions or operations which have to be executed in the same manner in order to always obtain the same result under the same circumstances.
- A **process** is a series of actions, changes, or functions bringing about a result.

**AM Framework**

- The combination of the templates, concepts and practices that facilitate the documentation of the asset management system in a systematic and disciplined manner.

**Value**

- In the context of AM value is taken to mean the quality (worth) that supports or assist in achieving the AM objectives. Said another way, value is how much a desired object or condition is *worth* relative to other objects or conditions.

**Benefit**

- In the context of AM and customer benefit is taken to mean increased wealth or ability to satisfy needs and wants with respect to production, distribution, and consumption of goods and services.

**Refurbishment**

- Refurbishment is the process of maintenance or minor repair of an item to ensure original functionality – i.e. give the asset a new birth date.

**Maintenance**

- Actions performed to keep an asset or group of assets in good working order.

**Capitalised Maintenance**

- Actions and costs required to keep an asset in good working order, but with significant replacement costs of main components of the asset.

**Performance**

- The degree to which a plan or activity operates according to specific criteria/standard/guidelines or achieves results in accordance with stated goals and plans.

**Prudent**

- Cautious, practical judgement or showing care and thought for the future; also
- In the context of AM, acting in good faith and in accordance with good industry practice.

**Life Cycle**

- Time interval that commences with the identification of the need for an asset and terminates with the decommissioning of the asset

**Lifecycle costing**

- A process to determine the sum of all expenses associated with a product, including acquisition, installation, operation, maintenance, refurbishment, discarding and disposal costs. (AS/NZS 4536:1999).

**Maintainability**

- The measure of the ability of an item to be retained in or restored to specified condition when maintenance is performed during the course of a specified mission profile and *Maintainability* deals with duration of maintenance outages or how long it takes to complete (ease and speed) maintenance actions.

**COMMERCIAL-IN-CONFIDENCE****Inspection**

- Inspection is a qualitative assessment of the condition of a network asset by visually inspecting the item for specific indications of deterioration or potential failure.

**Utilisation**

- The measure of available network capacity that is currently being used against the installed capacity. Utilisation = maximum demand/total installed capacity.

**Availability**

- Availability deals with the duration of up-time for operations and is a measure of how often the system is alive and well. It is often expressed as:

$$A = (\text{uptime}) / (\text{uptime} + \text{downtime})$$

**Reliability**

- Reliability is defined as the ability of a system or component to perform its required functions under stated conditions for a specified period of time; this means reliability is a measure of consistency. Improving reliability deals with reducing the frequency of failures over a time interval and is a measure of the probability for failure-free operation during a given interval. Reliability decisions are based on solid historical information relating to equipment performance, system performance, operations performance and associated costs.

**Security**

- Security of supply refers to the ability of the network to continue to supply electricity to customers when a key component of the network has failed. A more secure system can withstand a greater number of contingent events without any customers losing supply. Network redundancy or alternative supply circuits are a measure of security – usually expressed in N-1 terms and a more secure system results in a more reliable system.

**Sustainable**

- Achieving or retaining an optimum compromise between performance, costs and risks over the life cycle, whilst avoiding adverse long-term impacts to the organisation from short-term decisions.

**10. REVISIONS**

Issue number	Section	Details of Changes in this Revision
0	Complete Document	1 <sup>st</sup> issue in new format

**COMMERCIAL-IN-CONFIDENCE****11. APPENDIX 1 –REFERENCE DOCUMENTS<sup>12</sup>**

<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CECG2000.60	CHRM Guideline: Building a Respectful Workplace	This procedural guideline assists Essential Energy managers and employees with building a respectful workplace. It provides an efficient and effective procedure for preventing and managing vilification, discrimination, bullying and harassment.
CECG2000.62	CHRM Guideline: Equal Employment Opportunity & Diversity	This guideline covers recruitment, promotion, transfer, training and development, and conditions of service.
CECG2000.80	CHRM Guideline: Performance Recovery	The following procedure provides managers and employees with a framework for managing and correcting unsatisfactory performance.
CECG2000.81	CHRM Guideline: Performance Management	This Guideline is designed to assist managers to satisfactorily manage any incidences of unsatisfactory work performance, poor behaviour and misconduct by employees.
CECG2000.82	CHRM Guideline: Disciplinary Action	This guideline is designed to assist managers to satisfactorily manage any incidences of unsatisfactory work performance and misconduct by employees.
CECG3000.01	Essential Energy Code of Conduct	This document provides a common sense approach to maintaining a professional standard and improving workplace behaviour
CECG3000.03	Corporate Governance: Probity Plan	To provide information and template to create a Project Probity Plan.
CECM1000	Safety, Security Health & Environment Manual: Index	The scope of the SSHE Management System covers the full suite of Essential Energy's operations, activities, products and services. This includes the planning, development, maintenance and redevelopment of buildings, infrastructure and equipment.
CECM1000.06	SSHE Manual: Auditing & Inspection	This section describes the methodology of providing information on the results of audits to management, interested parties, regulators and employees.

<sup>12</sup> References to applicable Australian and International Standards are incorporated within this document suite, as and where applicable.

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Document Number	Document Title	Purpose of the Document
CECM1000.09	SSHE Manual: TotalSAFE	TotalSAFE is Essential Energy's electronic web based SSHE Information Management System. Its integrated software allows for the recording, analysis and reporting of ALL SSHE data. The TotalSAFE system facilitates business improvement processes by automating an important information recording and reporting.
CECM1000.10	SSHE Manual: Hazardous Materials	This section of the Safety, Security, Health and Environmental Manual deals specifically with hazardous materials.
CECM1000.13	SSHE Manual: Bushfire Prevention & Survival	This document outlines Essential Energy's aims to prevent the initiation and spread of bushfires from its premises and to reduce bushfire damage to electrical and electrically related infrastructure.
CECM1000.16	SSHE Manual: Project Safety & Environment Plan	This Project Safety and Environment Plan (PS&EP) is to assist Essential Energy employees, Contractors and Sub-Contractors working on Essential Energy controlled worksites uphold the aims of the Network Management Plan and meet its obligations under the Occupational Health & Safety Regulation 2001 and the Environmental Planning & Assessment Act, 1979 (EPA Act) as well as other related legislation, relevant industry regulations and codes of practice.
CECM1000.21	SSHE Manual: Personal Safety	This section applies to all Essential Energy employees, visitors and labour hire employees, and it defines the process to follow when: Using personal protective equipment that is appropriately designed and properly fitting
CECM1000.70	SSHE Manual: Environmental Impact Assessment – NSW	This Manual provides guidelines and information for Essential Energy employees and contractors involved in the EIA process.
CECM1000.71	SSHE Manual: Environmental Impact Assessment – QLD	The purpose of this manual is to outline the approval process that Essential Energy is required to follow for New Works and Maintenance Works in Queensland.
CECM1000.72	SSHE Manual: Air	This section of the Environmental Operations Manual has been developed to assist Essential Energy employees and contractors in understanding the issues involved in air pollution and in understanding how the activities they perform on a day to day basis can affect air quality.

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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CECM1000.73	SSHE Manual: Water	This manual has been developed for Essential Energy employees and contractors to raise awareness of how the activities they perform on a day to day basis can affect the health of natural watercourses.
CECM1000.74	SSHE Manual: Noise	This section of the Environmental Operations Manual has been developed to assist Essential Energy employees and contractors to be aware of how the activities they perform on a day to day basis can cause noise and vibration levels that may impact on the local community.
CECM1000.75	SSHE Manual: Waste	This section of the SSHE Manual provides information on the effective management of Essential Energy's commonly generated waste streams consistent with relevant legislative requirements, the Waste Classification Guidelines published in April 2008 and revised in December 2009 by the Department of Environment and Climate Change and Water (DECCW) and other advice issued by the DECCW.
CECM1000.76	SSHE Manual: Land Use	This section of the Environmental Operations Manual deals specifically with land use and is aimed at raising awareness within Essential Energy employees and contractors of the risks associated with some of the daily activities they perform.
CECM1000.77	SSHE Manual: Flora & Fauna	The information provided in this Manual will raise awareness in Essential Energy employees and contractors of how the activities they perform on a day to day basis can affect the local environment, particularly flora and fauna.
CECM1000.78	SSHE Manual: Community Consultation & Interaction	This section of the Manual has been developed to assist Essential Energy employees and contractors in raising awareness of how the activities they perform on a day to day basis can affect the communities in which they live and work.
CECM1000.79	SSHE Manual: Cultural & Heritage	The guidance provided in this section will assist in understanding the issue, planning and assessment of new proposals, obtaining licences, permits and approvals and ensuring projects are implemented and operations generally, are carried out in a manner that is consistent with Essential Energy's aim to protect and conserve all known or suspected heritage items.
CECM1000.80	SSHE Manual: Resource Conservation	This section provides some useful sources of environmental information available including some of the websites that Essential Energy refers to, e.g. to monitor changes to legislation.



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Document Number	Document Title	Purpose of the Document
CECM1000.81	SSHE Manual: Pesticide Notification Plan	The plan allows members of the community to take action to avoid contact with pesticides, if they wish. Essential Energy ensures that pesticides are applied to public places in a safe, responsible manner, minimising harm to the community or the environment.
CECM2000.49	CHRM Manual: Employee Handbook	To provide organisational information to employees
CECP0002	Board Policy: Governance	To provide a robust system of governance addressing, but not limited to: <ul style="list-style-type: none"> <li>• application and adherence to our Company Code of Conduct, including our values;</li> <li>• integrity and efficiency of support to the Board in its roles and functioning and in its relationship with relevant Ministers;</li> <li>• integrity and efficiency of support to the Board Committees in their roles and functioning;</li> <li>• risk management and compliance with statutory requirements;</li> <li>• disclosure, transparency and liaison with shareholders and stakeholders; and</li> <li>• implementation of the company's strategy and directions through the company and business planning, resourcing processes, business systems, policies, procedures and performance monitoring.</li> </ul>
CECP1000	Corporate Policy: Safety, Security, Health & Environment	The principles set out in this policy have been applied in assessing the compliance obligations associated with Essential Energy's metering equipment assets
CECP1004	Corporate Policy: Asset Management	This policy sets out the core principles that are to be applied in managing Essential Energy's assets
CECP1005	Corporate Policy: Human Resources	Corporate Policy on Human Resources within Essential Energy. This Corporate Policy applies to everyone associated with Essential Energy.
CECP1006	Corporate Policy: Finance	Corporate Policy on Finance within Essential Energy. This Corporate Policy applies to everyone associated with Essential Energy.
CECP1021	Corporate Policy: Risk	A policy which outlines what Essential Energy is doing to demonstrate their commitment to risk management. This Corporate Policy applies to everyone

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Document Number	Document Title	Purpose of the Document
	Management	associated with Essential Energy
CEOF1001.01	SSHE Manual: System Audit Report Template	To provide a template to report results of SSHE System Audits.
CEOF3013	Network Investment Document (NID)	Template used for request for Network Capital Expenditure
CEOF6052	System Operations: Operating agreement	The Operating Agreement is used in situations where neither party involved in an 'isolation' has complete operational control over all the isolation points and ensures that the isolation remains secured for the duration of the works.
CEOF6243.01	Corporate Investments – Non system Projects > \$1M	Final Corporate Business Case & Project Management Plan (Part A) For Projects > \$1M
CEOF6243.03	Preliminary Corporate Investment – Non System: Part A – Projects > \$1M	Preliminary Corporate Business Case (Part A) For Projects >\$1M
CEOF6243.04	Managing Director Approval Submission: Non Systems Projects	The purpose of this document is to obtain initial/amended funding approval where a Corporate Business Case is not required.
CEOF6243.05	Business Case: < \$1M or Exempt	Business Case for Projects < \$1M & Exempt Projects
CEOF6243.06	Supplementary corporate Investment – Non System	Corporate Business Case: Part A Supplementary
CEOF6344	Power & Regulating Transformer Major Maintenance & Capital Refurbishment Field Report	Data capture form to be used when major maintenance and capital refurbishment takes place on Power and Regulating Transformer
CEOF6397	System Operations: Switching Log	Authorised Field Officers use when no written instruction available in the field.

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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CEOF6488	Zone Substation: Transformer Refurbishment Specification Form	This form specifies and captured asset management specific data about transformer refurbishment
CEOF6659	Network Planning: Low Voltage Pole Rebate	This form is used to initiate the process and determine whether a Tax Invoice or 'Statement by Supplier' is required.
CEOF6689	Contract Management Forms List	Essential Energy Forms associated with Contract Management
CEOM7004	Materials Inventory: Contestability	This operational manual provides the information required for Accredited Service providers working within Essential Energy's distribution franchise area.
CEOM7005	Asset Inspection Manual	The manual is to be used by Essential Energy asset inspectors, contractors and other personnel engaged by Essential Energy, in inspecting, treating and reporting of defects found on the electrical network.
CEOM7011	Standard Overhead Conductor: Current Rating Guide	This manual is intended to be an easy ready-reference for Essential Energy staff who wishes to assess the thermal (load current) rating of bare overhead conductors across a range of variable conditions such as design temperature, ambient temperature and wind speed based on the ESAA Publication D (b) 5-1988.
CEOM7047	Operating Manual (29 documents)	Operating notes directing and specifying the safe operating procedures and practices required to safeguard staff and equipment when operating specific electrical equipment
CEOM7050.05	Document & Data Control & Records Management	This document forms part of the Network Division Operational Manual CEOM7050. The purpose of this manual is to describe how document and data control will be implemented within the Networks Division.
CEOM7050.23	Engineering Services: Contract Management	Follow these instructions to manage contracts for the supply of goods or services for Networks Services, for example for the design and/or construction of Transmission and Zone Substations, Sub-Transmission or Distribution Design.
CEOM7081	Subtransmission line design manual	The requirements for the design and construction of Subtransmission lines for use in the Essential Energy network are detailed within this design manual and associated construction manuals.

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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CEOM7092	Distribution Planning Manual	This manual sets out Essential Energy's requirements for planning of the distribution network and to provide an educational resource to Distribution Planners & other employees at Essential Energy
CEOM7094	Renewal & Refurbishment Manual	This manual is required to ensure that a whole of network risk approach is taken and facilitate a reasonable compromise between AS/NZS7000, Essential Energy Overhead Design Manual and applicable standards. The manual also provides guidance to maximise the life and use of existing network assets and to ensure capital investment is prudent.
CEOM7097	Overhead Design Manual	This manual sets out Essential Energy's requirements for the design of overhead feeders
CEOM7098	Underground Design Manual	This manual sets out Essential Energy's requirements for the design of underground feeders (cables).
CEOM7099	Overhead Construction Manual	This manual sets out Essential Energy's requirements for the construction of overhead feeders
CEOM7199	Underground Construction Manual	The manual is to be used by Service Providers, contractors and other personnel, in the construction of Essential Energy's underground network.
CEOM7250.02	Network Services: Project Process Flow Chart	This document shows the process flow for Network Services Project Process and associated Project Management Processes.
CEOM7250.03	Network Services: Project Process Flow Chart – Summary Flow Charts	This document shows the process flow for Network Services Project Process and associated Project Management Processes.
CEOM7772	Zone Substation Field Work Manual	These Zone Substation manuals provides practical 'in the field' assistance to Construction and Maintenance personnel and those subcontractors. It will assist these personnel to carry out their duties in a reliable, consistent manner that complies with the organisation's Safety, Environmental, Quality and Customer Service obligations.
CEOM7772.01	Zone Substation: CB & Tap Changer Maintenance	to specify the recommended maintenance intervals for tapchangers, circuit breakers and reclosers

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Document Number	Document Title	Purpose of the Document
CEOM7773	Zone Substation Inspection & Maintenance Manual	These Zone Substation manuals provides practical 'in the field' assistance to Construction and Maintenance personnel and those subcontractors. It will assist these personnel to carry out their duties in a reliable, consistent manner that complies with the organisation's Safety, Environmental, Quality and Customer Service obligations.
CEOM7774	Zone Substation Technical Guidelines (Part 1 & 3)	These Zone Substation manuals provides practical 'in the field' assistance to Construction and Maintenance personnel and those subcontractors. It will assist these personnel to carry out their duties in a reliable, consistent manner that complies with the organisation's Safety, Environmental, Quality and Customer Service obligations.
CEOM7775	Zone Substation: Technical Instructions & Manuals Catalogue	This document provides an index and locations of specific technical manuals and instruction catalogues
CEOM7776	Zone Substation: Reference Index	The purpose of this document is to assist in locating forms used in relation to Zone Substation activities and guides.
CEOM8014	Metering Services Manual	The main procedural guidelines used to manage and operate metering equipment
CEOM8018	Network Asset Management Plan	The Network Asset Management Plan (NAMP) provides a summary of the asset management plan outcomes and consolidates the resources required to manage the network assets to the required service levels. Additionally, the NAMP provides the link between the Business Plan strategic objectives and priority actions and the asset management plans and the annual budgeting process.
CEOM8018.01	Distribution Overhead Feeders AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.03	Customer Connections AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements
CEOM8018.04	Distribution Substations AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements

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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CEOM8018.05	Network Underground Systems AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.06	Subtransmission Overhead Feeders AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.07	Telecommunication Equipment AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.08	Load Control Equipment AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.09	SCADA & DSA equipment AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.10	Generation AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.11	Subtransmission Transformers AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.12	Subtransmission Equipment AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.13	Metering AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.

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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CEOM8018.14	Public Lighting AMP	This asset management plan details the activities and resources, responsibilities and timescales required to deliver stakeholder requirements and defined service levels consistent with the Business Plan requirements.
CEOM8018.15	Vegetation Management	Document specifying activities, resources and timing required to manage vegetation to the required safety specifications and to minimise network interruptions due to vegetation causing unplanned outages
CEOP1023	Public Lighting: Management Plan 2010	The purpose of this Public Lighting Management Plan is to establish the foundations on which Essential Energy's street lighting service will be delivered to the customer's within Essential Energy's distribution footprint.
CEOP1060	Corporate Policy: Records Management	This Procedural Guideline provides an appropriate framework for record management that will promote best practice and meet legislative, evidential and accountability requirements.
CEOP1068	Network Services: Project Management	This guideline will ensure projects within Network Services of Essential Energy are undertaken with the use of a common process model that incorporates common process activities to facilitate the Network Services Project Management methodology.
CEOP1105	Information Security: Compliance Audit Plan	Essential Energy has in place an Information Security Management Framework to help achieve this protection. The framework incorporates approved information security controls which are implemented to reduce risk to an acceptable level.
CEOP1107	Property: Disposal Procedure	The purpose of the Asset Disposal procedures is to detail the process flow, define the stakeholders, identify reference material and the inputs and outputs within the process for the Pre-Contract phase and Contract phase.
CEOP1115	Statement of Business Ethics	This Statement provides guidance for suppliers and contractors when engaging in business activities with Essential Energy. This includes the purchasing and supply of goods and services, disposal of goods and equipment, and the contracting out of activities and services.
CEOP1121	Demand Management Strategy	This document is Essential Energy's Network statement in regard to network-driven demand management activities.

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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CEOP2008	Network: Capital Expenditure	To establish a systematic and consistent approach to the assessment, approval, monitoring and effective control of Capital Expenditure on Essential Energy's Network.
CEOP2034	Asset Inspection: Critical Distribution Equipment	This document details the strategy and process to provide a condition monitoring program that targets specific critical assets identified by the Regional Planning and Customer Connection Manager.
CEOP2045	Network Operations: Access permit	This procedure is to ensure that the use of the Access Permit Form and the condition under which the Access Permit is issued provide a safe work and or test environment for employees working on or near Essential Energy's High Voltage System.
CEOP2047	Network Operations: Authority for Placing Major Electrical Plant/Equipment into Service	The purpose of this procedure is to ensure that Network Operations receives written notification that all construction and pre-commissioning checks on Electrical Plant/Equipment are complete and ready for service.
CEOP2050	Network Operations: Low voltage back feed	The purpose of this procedure is to explain the use of the form to provide Network Operations with relevant Low Voltage information where Low Voltage paralleling is required.
CEOP2056	Switching request & planned outage notification	The purpose of this procedure is to explain how the forms are used & to ensure that all planned switching including live line work on Essential Energy Electrical System is formally notified to Network Operations prior to the switching taking place.
CEOP2057	System alteration notification	This procedure ensures that alterations to the Essential Energy's network system not captured by normal work packages and other planned work and maintenance programs are notified to network operations and asset management system as appropriate.
CEOP2060	Network Operations: Emergency communication	To ensure the effective transmission of emergency information so that the safety and wellbeing of Essential Energy employees, customers and the public are maintained.
CEOP2061	System Operations: High Voltage Live Line Work Operational Requirement	This document is applicable to System Operations and covers the necessary steps to be considered for live line work, from the receipt of the request to undertake live line working techniques on the network, to the restoration of the network on conclusion of that work.



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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CEOP2062	Network Operations: Manual reclosing of overhead lines	This policy provides guidance to Network Operators in assessing the risks and benefits of attempting a manual reclose of an electrical distribution system protection device after an unplanned operation.
CEOP2065	Network Operations: Authorisation	This document has been prepared to provide a uniform approach to System Operations Training and Authorisation across Essential Energy.
CEOP2090	Network Power Quality Strategy	This document provides direction for Essential Energy to move towards compliance with relevant the power quality requirements as stipulated in Supply Standards: Electricity Supply Standard (CEOP8026).
CEOP2111	Corporate Risk Management Procedure	The purpose of this operational procedure is to ensure uniform processes are in place to identify, communicate and manage material risks within Essential Energy.
CEOP2153	Zone Substation Emergency Response Plan	The objectives of this plan are to provide the necessary information for the restoration of Zone Substation capacity and/or functionality within the shortest possible timeframe and facilitate the decision making process.
CEOP2191	Capital Governance: Capital Portfolio & Corporate Business Case	To provide guidance for all business cases requiring executive approval. This procedure applies to all investments above thresholds Non-System and System.
CEOP2224	Media: Incident Guidelines	This procedure sets out the framework for the appropriate way to respond to media enquiries regarding an incident in which Essential Energy's assets or activities are implicated.
CEOP2245	Asset Refurbishment Strategy: Zone Substations	The purpose of this document is to establish policy and overall strategies for asset management of substation plant especially with regards to replacement or refurbishment considerations.
CEOP2291	Subtransmission design procedure	This document outlines the process that shall apply to all internally designed Essential Energy Subtransmission power lines within the franchise area covered by Essential Energy.
CEOP2296	Legal Services: Right to Information	To set out Essential Energy's procedure for meeting its legal requirements under the Government Information (Public Access) Act 2009 ('the GIPA Act'). This document should also be read in conjunction with the GIPA Act.

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Document Number	Document Title	Purpose of the Document
CEOP2356	Country Support: Principles	The purpose of this paper is to document the agreed Essential Energy principles of Country Support that aim to ensure that any Essential Energy domestic and small business customer (<160MWH), identified as being in a situation of genuine financial hardship, are provided a level of assistance and support that addresses their immediate financial commitment to Essential Energy as well as their need for a continued supply of energy.
CEOP2375	Evaluating New Material / Products for Consideration	This guideline will outline the procedure to adhere to when approving new products/materials for use on Essential Energy's electrical network.
CEOP2381	Disconnection & Reconnection of Customer Electrical Supply	The purpose of this Procedure is to ensure that the disconnection and/or reconnection of electricity supply at a customer's premises is performed safely, correctly and in a consistent manner across Essential Energy.
CEOP2395	Customer Policy: Disconnection & Reconnection	The actual disconnection and reconnection of supply must be performed by an appropriately qualified and /or authorised person. It is essential that these tasks be performed safely, consistently and in accordance with CEOP2381 Disconnection and Reconnection of Customers Electrical Supply.
CEOP2416	Asset: Capitalisation	To achieve a consistent interpretation of capital expenditure across all areas of Essential Energy
CEOP2420	Replacement Guideline – SCADA & Load Control	Outline the process by which Network Services / Technical Services will undertake a review of SCADA and Load Control facilities afforded to Essential Energy.
CEOP2438	Procurement Manual	Provides the policy framework for the procurement of goods and services by employees, agents and contractors on behalf of Essential Energy. Provides detailed procedures for undertaking procurement activities.
CEOP2443	Risk: Fraud & Corruption Control	This procedure set outs Essential Energy's position in relation to managing the risk of fraud and corruption
CEOP2463	Network Reliability Strategy	This document provides direction for Essential Energy to achieve compliance with the Design Reliability and Performance Licence Conditions.
CEOP2474	Underground Asset Inspection & Maintenance	This document defines the procedures to be adhered to by Essential Energy in the delivery of successful distribution ground mounted substations and switchgear, pit and pillar inspections

30 April 2014

Approved By: Chief Engineer

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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CEOP6001	Strategic Procurement & Contracts: management process	To map the workflow that the Strategic Procurement & Contracts Group follow for the management of contracts & tenders.
CEOP8002	High voltage protection guideline	This Operational Procedure sets out the general requirements for protection systems installed on Essential Energy's high voltage transmission, subtransmission and distribution systems.
CEOP8003	Sub transmission & Distribution Network Planning Criteria & Guidelines	This document forms the basis of transmission, subtransmission and distribution Network Planning best practice for Essential Energy. To be used by Essential Energy's Network Planning and Design staff as the standard for planning Essential Energy's electricity reticulation network.
CEOP8004	Network Management Plan Chapter 2: Customer Installation Safety Plan	The purpose of the Customer Installation Safety Plan is to ensure the provision of safe electrical installations for connection to Essential Energy's transmission and distribution system and the safe connection of such installations.
CEOP8005	Network Management Plan Chapter 3: Public Electrical Safety Awareness Plan	The Plan provides details of strategies used to raise the public's awareness of the hazards that result from the interaction of people and the electricity supply network assets, and to provide to them motivation and knowledge to minimise their risk exposure.
CEOP8007	Mains & Subtransmission Field Equipment Maintenance	The purpose of this Procedural guideline is to document Essential Energy's mains and distribution field equipment maintenance management strategy to provide the basis for development of maintenance procedures for each equipment category.
CEOP8009	Distribution Substation & Switchgear Maintenance	This Procedural guideline outlines the schedule for periodic inspection/maintenance of distribution substations, regulators, reclosers and sectionalisers.
CEOP8010	Electricity Network Asset Inspection	The purpose of this Guideline is to document Essential Energy's criteria for the inspection, assessment and auditing of work processes used to inspect Essential Energy's overhead network, including the above ground components of underground distribution systems.
CEOP8011	Subtransmission & Zone Substation: Maintenance	This procedure documents Essential Energy's network maintenance strategy and technical maintenance plans for each asset category within Sub-Transmission and Zone Substations

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Document Number	Document Title	Purpose of the Document
CEOP8019	Capital Contributions	The Guideline outlines the requirements of the Independent Pricing and Regulatory Tribunal's (IPART) Capital Contributions and Repayments for Connections to Electricity Distribution Networks in NSW, Determination No.1, 2002. Determination No.1, 2002 sets out the responsibilities of Essential Energy and the customer/developer.
CEOP8022	Network Management Plan Chapter 4: Bush Fire Risk Management Plan	The objective is to manage Essentials Energy's assets in a manner that minimises the risk of Bush Fires.
CEOP8026	Supply Standards: Electricity Supply Standard	This document is intended to provide details of the objectives which Essential Energy has adopted in relation to the various system characteristics that influence the quality, reliability and security of electricity supply to its valued customers
CEOP8027	Metering Services: Network standard Metering	This document sets out minimum metering requirements for standard and replacement meters, as determined by Essential Energy.
CEOP8029	Network Management Plan Chapter 1: Network Safety & Reliability	The objective of this plan is to establish a framework to ensure that Essential Energy's transmission and distribution system provides an adequate, reliable and safe supply of electricity of appropriate quality.
CEOP8030	Electrical Safety Rules	These Electrical Safety Rules provide a uniform set of safe work requirements which persons must comply with when involved with work on or near electrical apparatus. These rules apply to all persons (Employees, Contractors and Accredited Service Providers) working on or near high voltage and low voltage electrical apparatus associated with Essential Energy's system.
CEOP8032	Transmission & Zone Substation Design Guidelines	The specific requirements in this guideline have been adopted by Essential Energy to standardise the design, procurement, construction and maintenance of its substations.
CEOP8046	Network Planning: Easement Requirements	This document provides guidelines for easement requirements for powerlines in Essential Energy's New South Wales distribution area.
CEOP8074	Corporate Disposal	This Code of Practice prescribes the general guidelines and framework to be used in all disposal activities to promote fair and open competition, probity and accountability whilst achieving best value for the disposal or sale.

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<b>Document Number</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
CEOP8084	SCADA & DSA Design Guidelines	These guidelines are designed to cover all requirements that need to be satisfied to ensure Essential Energy's minimum standards for SCADA & DSA Systems are met while maintaining the technical currency of these systems.
Network Vision 2012	Network Vision 2012	Network Vision 2025 sets a common vision for our future network business. It is the culmination of extensive collaboration and consultation, including workshops and in-depth interviews with representatives from across our business. It will guide our decision making, shape our success and ensure our vision becomes a reality.

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<b>External Documents</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
<b>NSW Public Lighting Code, 2005</b>	NSW Public Lighting Code, 2006	The purpose of the NSW Public Lighting Code (to be referred to as the 'Code') is to provide guidance on the provision of Public Lighting Services by setting out minimum performance standards and outlining the rights and obligations of Public Lighting Service Providers (to be referred to as 'Service Providers') and Public Lighting Customers (to be referred to as 'Customers').
<b>Electricity Supply Act 1995</b>	Electricity Supply Act 1995	An Act to regulate the supply of electricity in the wholesale and retail markets; to set out the functions of persons engaged in the conveyance and supply of electricity; and for other purposes.
<b>NSW Treasury TPP 08-2</b>	Total Asset Management (TAM) requirements for updating the NSW State Infrastructure Strategy (SIS)	The principles set out in this guide have been applied in managing Essential Energy's assets.
<b>PAS 55:2008 Parts 1 &amp; 2</b>	Asset Management	Publicly Available Specification for the optimised management of physical assets
<b>AS/NZS ISO 31000:2009</b>	Risk Management	This standard provides the guiding principles adopted by Essential Energy in managing network risks.

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<b>Documents available on EssentialNet website</b>	<b>Document Title</b>	<b>Purpose of the Document</b>
<a href="http://www.essentialenergy.com.au/content/connection-offers-and-contracts">http://www.essentialenergy.com.au/content/connection-offers-and-contracts</a>	Essential Energy Connection Services	Based on your connection needs Essential Energy offers 5 types of connection offers when requesting connection to our Distribution Network. To download a copy, click on the links below or if you would like a copy sent to you please call us on 13 23 91.
<a href="http://www.essentialenergy.com.au/content/our-energy-network-streetlights">http://www.essentialenergy.com.au/content/our-energy-network-streetlights</a>	Essential Energy's streetlight business	Public lighting plays an important role in providing safe, secure and attractive public areas for both pedestrians and vehicles. It also represents between 25 and 70 per cent of any individual local government's corporate energy consumption and greenhouse gas emissions.
<a href="http://www.essentialenergy.com.au/content/electricity-network-pricing-and-information">http://www.essentialenergy.com.au/content/electricity-network-pricing-and-information</a> Download document	Distribution Annual Planning Report 2013	Essential Energy is required to prepare and publish a Distribution Annual Planning Report that is compliant with the requirements of the National Electricity Rules (Section 5.13.2 and Schedule 5.8