ASSET MANAGEMENT STRATEGY

Version 2.0, April 2018

Endeavour Energy

CONTENTS

EXECUTIVE SUMMARY

Endeavour Energy historically performs well against industry performance benchmarks and expects to continue its strong performance trajectory into the future. Reflecting this, the organisation has adopted the strategic goal of being the best performing network in Australia within five years.

To achieve this we have increased our focus on improving asset management efficiency, assessing our asset management performance against the organisational objectives of safety, reliability and sustainability, and also against community expectations of efficiency and effectiveness. In this context, the Company has evolved its asset management model along the lines of the Asset Owner-Asset Manager-Service Provider model to ensure ongoing strategic asset management focus on investment efficacy and sustainability in order to deliver continued gains in operational performance and business efficiency.

In this model, the Asset Manager is responsible for managing Endeavour Energy's electricity network assets on behalf of the Asset Owner. As such, the purpose of the Asset Manager is to ensure that the Asset Owner's objectives for the network are realised. These objectives are defined by Endeavour Energy's three strategic goals:

- ***Safety:*** deliver best practice safety performance for our employees, contractors and the community.
- ***Reliability***: maintain the reliability, security and sustainability of the network.
- ***Sustainability***: ensure our business is sustainable by making it efficient, affordable and competitive so that it can meet future challenges.

These objectives provide the key inputs to the asset management process, which in turn are realised through Endeavour Energy's capex and opex programmes delivered by the Service Provider. The figure below provides a simplified view of this process.

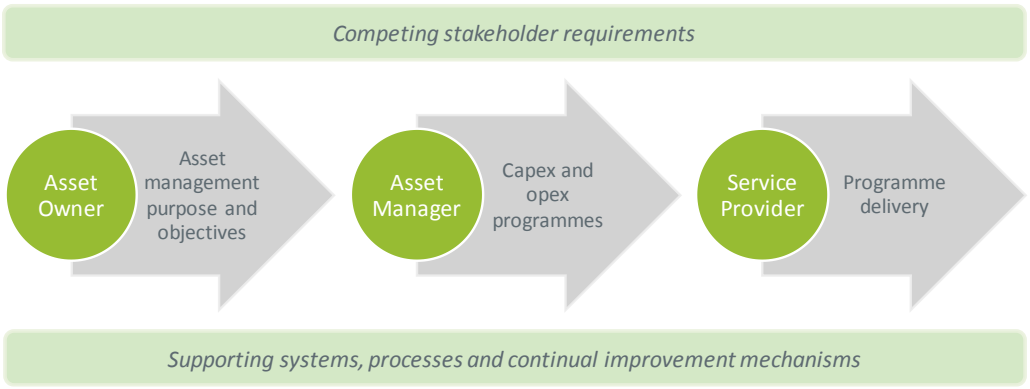

Figure 1. Overview of asset management process

Our asset management process is implemented through two key platforms:

- This Asset Management Strategy, which provides a "vision" and supporting initiatives that effect change on business as usual processes to deliver the network strategy.
- Business as usual processes including the Asset Management System, which is comprised of tools, systems and processes that develop the optimised investment programmes and result in effective management of the network.

Under Endeavour Energy's business model, the structure of the Asset Management division is designed to efficiently implement this process. In so doing, the Asset Management division works in close partnership with the Service Provider to ensure that optimal organisational outcomes are achieved, with the entire process governed through the oversight of the Executive Network Asset Management Committee, chaired by the Asset Owner.

1. BACKGROUND

Endeavour Energy has a long history of adapting its business and asset management approach to address the challenges of its changing business environments and to position itself for the future. The Company's approach to its operational business management and asset management functions are intimately linked, with the asset management system reflecting the business approach required to deliver on key corporate strategies and plans.

Recent revenue determinations surfaced new challenges for us going forward. The need to better target network capital investment towards addressing network risk and network performance outcomes in the face of changing network needs, and to do so with greater operational efficiency required the Company to further adapt and refine its asset management approach.

In this context, the Company has set a strategic corporate goal of *"being the best performing network in Australia within five years."*

Consequently a revised network capital investment portfolio has been developed that positions the network for the changing demands of customers by appropriately balancing present network risk with future network need. Underpinned by our continuing business transformation program Endeavour Energy will successfully deliver its Corporate Plan whilst at the same time underspending our capital investment allowances as set in the previous revenue determination.

To ensure this a further refinement of the asset management philosophy and structure has been initiated. A revised asset management business model has been implemented based on the "Asset Owner – Asset Manager – Service Provider" model, and is currently under further development and refinement.

This document outlines Endeavour Energy's strategic approach to asset management. It provides an overview of the Asset Management model, and the role of the Asset Owner and its interaction with the Asset Manager and the Service Provider. It also provides an overview of the asset management system, the development requirements of this, and the strategy required to achieve the objectives set by the Asset Owner.

2. BUSINESS ENVIRONMENT

2.1 ABOUT ENDEAVOUR ENERGY

Endeavour Energy owns, operates and manages the electricity distribution network and associated infrastructure within its licenced franchise area. We are a commercially successful, customer-focused business. Our vision over the next five years is to create a business that thrives with the opportunities that will emerge as the Australian energy industry transforms, and in doing so be recognised as the best performing distribution network in Australia. By the year 2023, we intend to be known for our safety excellence, efficiency and reliability performance, as benchmarked by the AER and as assessed by our own standards.

Endeavour Energy's network spans nearly 25,000 square kilometres in Sydney's Greater West, the Blue Mountains, Southern Highlands, Illawarra and the South Coast of NSW. It provides reliable electricity supply to major load centres in Western Sydney (the third largest economy in Australia), including the only two Priority Growth Centres in NSW located in Sydney's North West and South West regions. Our regulatory asset base (RAB) is valued at more than $6 billion, and provides power to almost 1 million customers, or approximately 2.4 million people in households and businesses[1].

[1] As at 30 June 2017

2.2 KEY STAKEHOLDERS

Endeavour Energy is a regulated electricity distribution business with assets spread across a broad geographical area as noted above. Given this, our performance and the way we manage our assets has an impact on a broad range of stakeholders who are not just those with a direct commercial relationship with the Company. Endeavour Energy's corporate plans and business strategies recognise this not only in their objectives but in the culture required to meet the broad ranging requirements of all key stakeholders.

Endeavour Energy's key stakeholders are:

- End-use customers;
- Communities in which Endeavour Energy's network assets are situated;
- Electricity retailers;
- Other connected networks (TransGrid, Ausgrid, Essential Energy, and other private networks), and generators;
- Employees, suppliers and external service providers
- Industry governance and regulatory bodies (such as the NSW Department of Industry, Workcover, etc);
- Independent Pricing & Regulatory Tribunal (IPART – the technical and licence compliance regulator in NSW);
- Australian Energy Regulator (AER the economic energy markets and networks regulator);
- Australian Energy Market Operator (AEMO – the administrator and operator of the wholesale National Energy Market);
- Australian Energy Market Commission (AEMC – the rule maker under the National Electricity Law); and
- Shareholders, including the NSW Government.

Understanding and meeting the needs of this broad range of public and private stakeholders presents unique challenges that Endeavour Energy continually faces and meets. Ongoing refinement of our business and asset management model is necessary to continue to adapt to the changing requirements of these stakeholders.

2.3 ENDEAVOUR ENERGY'S ASSETS

Endeavour Energy's network covers 24,980 square kilometres and includes densely populated and regional areas of NSW. Our distribution network assets include:

- A sub-transmission system of consisting 132kV, 66kV and 33kV assets;
- A high voltage distribution system of consisting of 22kV, 11kV and 12.7kV SWER assets;
- A low voltage distribution system of 230V and 400V assets;
- A total of 24 sub-transmission substations, 164 zone substations and 31,900 distribution substations across voltage levels from 11kV to 132 kV;
- Nearly 60,000 km of overhead lines and underground cables;
- Metering assets;
- Communications assets; and
- Street lighting assets.

Endeavour Energy's licenced franchise supply area is shown in Figure 2.

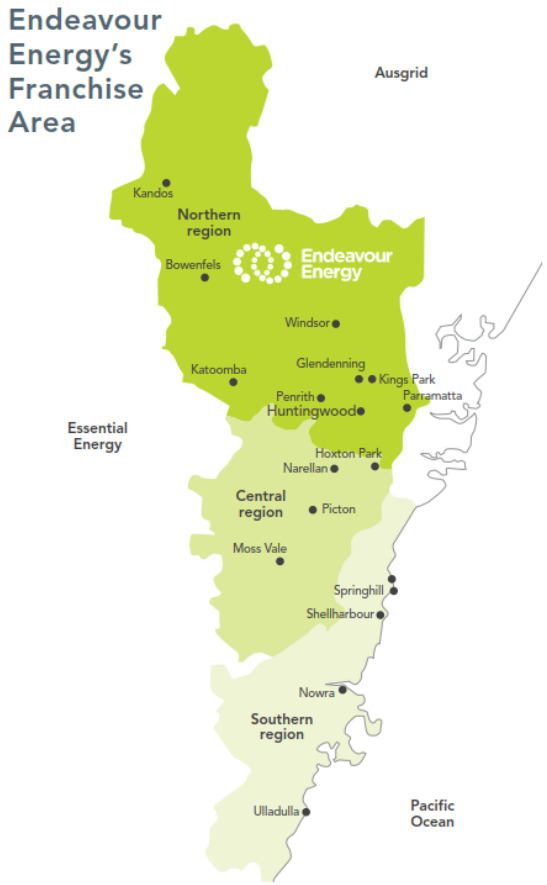

Figure 2: Endeavour Energy's franchise area

2.4 STRATEGIC BUSINESS CONTEXT AND CHALLENGES

Endeavour Energy's key strategic business context and challenges are as follows:

- ***Safety continues to be a number one priority*:** Our most important challenge is to ensure that in conducting our business we maintain a safe network for our employees, our customers and our communities. In this regard, safety is our highest priority. We will continue our historical focus on safety leadership, culture, performance and measurement. This safety management framework has contributed to the current safety results that are the best in the history of our organisation, and we expect that this ongoing focus will maintain this path of continuous improvement in safety outcomes into the future.

- ***Changing customer energy needs and network requirements:*** Customer usage patterns continue to change, influenced by price, energy efficiency, increasing domestic and large scale-embedded generation, emerging technologies such as energy storage and the expected future uptake of electric vehicle. Further, the existing network design and the assets employed are from an era where the energy supply model was vastly different to that which exists today. Endeavour Energy recognises that it is no longer appropriate to replace assets that have reached the end of their useful life with like-for-like equivalents, but to take the opportunities thus presented to reshape the network design using modern technology assets more suited to changing customer end-use requirements.

  Notwithstanding these changes, medium and long-term forecasts for our supply area continue to indicate stable growth in energy consumption and peak demand, largely fuelled by greenfield

development (where limited network currently exists) and organic growth due to infill and old-area redevelopment.

- ***NSW Growth centres:*** The North-West and South-West sectors of Sydney (in Endeavour Energy supply franchise area) are two of the fastest growing areas within Australia, and together represent the largest growth area of NSW. Delivering efficient and timely infrastructure to these areas and the proposed Western Sydney Airport is key to the ongoing growth of the NSW economy.

  Continued downward pressure on costs: Endeavour Energy is responding to the community expectations of lower costs, greater operational efficiency and the maintenance of service standards through its various business transformation initiatives. Benchmarking continues to be a tool employed externally by the AER, and internally by the Company to assess our efficiency journey. Endeavour Energy is committed to continuous improvement and demonstrating increasing efficiency beyond the regulator expectations for the benefit of our customers and other stakeholders.

- ***Changing and increasingly complex regulatory landscape:*** Our newly appointed technical regulator, IPART requires substantially increased evidence that our organisation has sound and effective asset management strategies in place. It is now a requirement that the company's Asset Management system and functions comply with the requirements of the international asset management standard ISO 55001 as a NSW Distribution Licence Condition. Endeavour Energy is working towards achieving certification to this standard by late 2018.

- ***Power of choice and related meter ownership changes:*** From December 2017 onward, the "power of choice" suite of changes to the National Electricity Rules will result in Endeavour Energy providing a decreasing share of metering services to small retail customers within our supply franchise area. This change will impact the management efficiency of these critical assets and will necessitate changes to many revenue customer-interaction business processes.

- ***Community expectations and bushfire prevention:*** The 2015 and 2016 coronial and civil court proceedings involving Endeavour Energy, as well as similar proceedings in other jurisdictions, provide insight into changing community expectations and future related challenges in this respect. Approximately one-third of Endeavour Energy's distribution network is in bushfire prone areas, and so preventing network-related bushfire starts remains an ongoing asset management focus area.

- ***Network Operational Systems:*** The changing demands on the functionality of the energy supply network requires greater dependence on automation, the capability to remotely interrogate equipment, enhanced network configuration control (down to the end-use customer level), and the ability to directly interact with customer installed equipment. This requires ongoing renewal and development of our network operational systems and places even greater importance on control system integrity and cyber security. Renewal and adaption of operational support and control systems combined with modern energy supply technologies will be required to address these challenges.

- ***System security and the increasing incidence of cyber-attack:*** Maintaining and strengthening the integrity of Endeavour Energy's information and communications system that control our network remains a high-priority due to the ever-increasing risk of system hacking and cyber-attack. The Company remains ever-vigilant in this regard, and this requires ongoing development in our cyber-security and business continuity plans affecting our network operational-technology assets.

3. NETWORK STRATEGY

3.1 PURPOSE AND OBJECTIVES

The requirements of the Asset Owner articulated through the Corporate Strategy set the direction for the Asset Manager managing the electricity network and its associated assets. The Asset Owner has defined Endeavour Energy's vision to be "*the best performing network in Australia with in five years*". Our corporate strategy aimed at achieving this vision is predicated on achieving three key strategic goals:

- Safety – deliver best practice safety performance for our employees, contractors and the community;
- Reliability – maintain the reliability, security and sustainability of the network; and
- Sustainability – ensure our business is sustainable by making it efficient, affordable and competitive so that it can meet future challenges.

Supporting these goals prioritised areas of focus each with their own specific set of plans. Whilst not detailed here, the relationship between these and the strategic goals is shown diagrammatically in Figure **3** below.

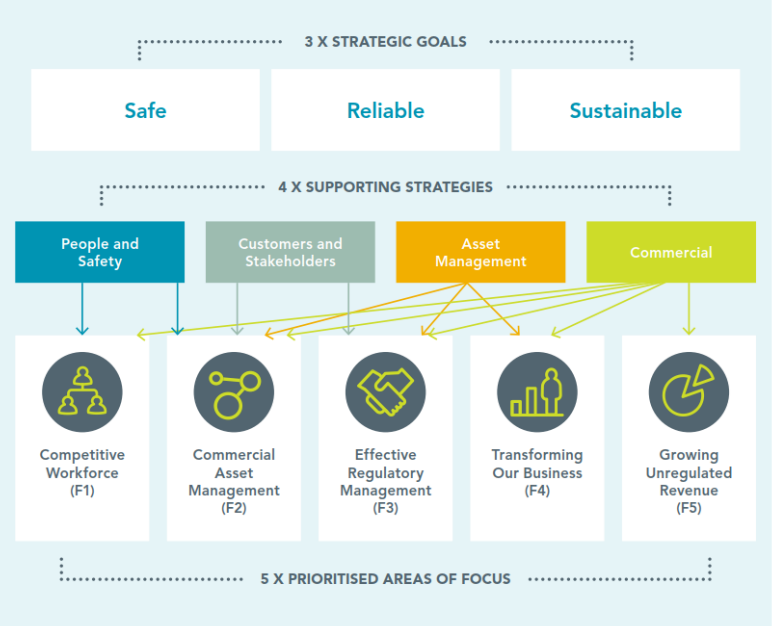

Figure 3: Corporate Strategy Implementation Structure

The corporate strategy is enacted through a series of strategic goals, supporting strategies and prioritised areas of focus. It provides the direction under which the Asset Manager and Service Provider perform their roles in accordance with the requirements of the Asset Owner. This is shown diagrammatically in Figure 4. This illustrates how the purpose and objectives are captured through the Corporate Plan, which then provides the "inputs" to the asset management process.

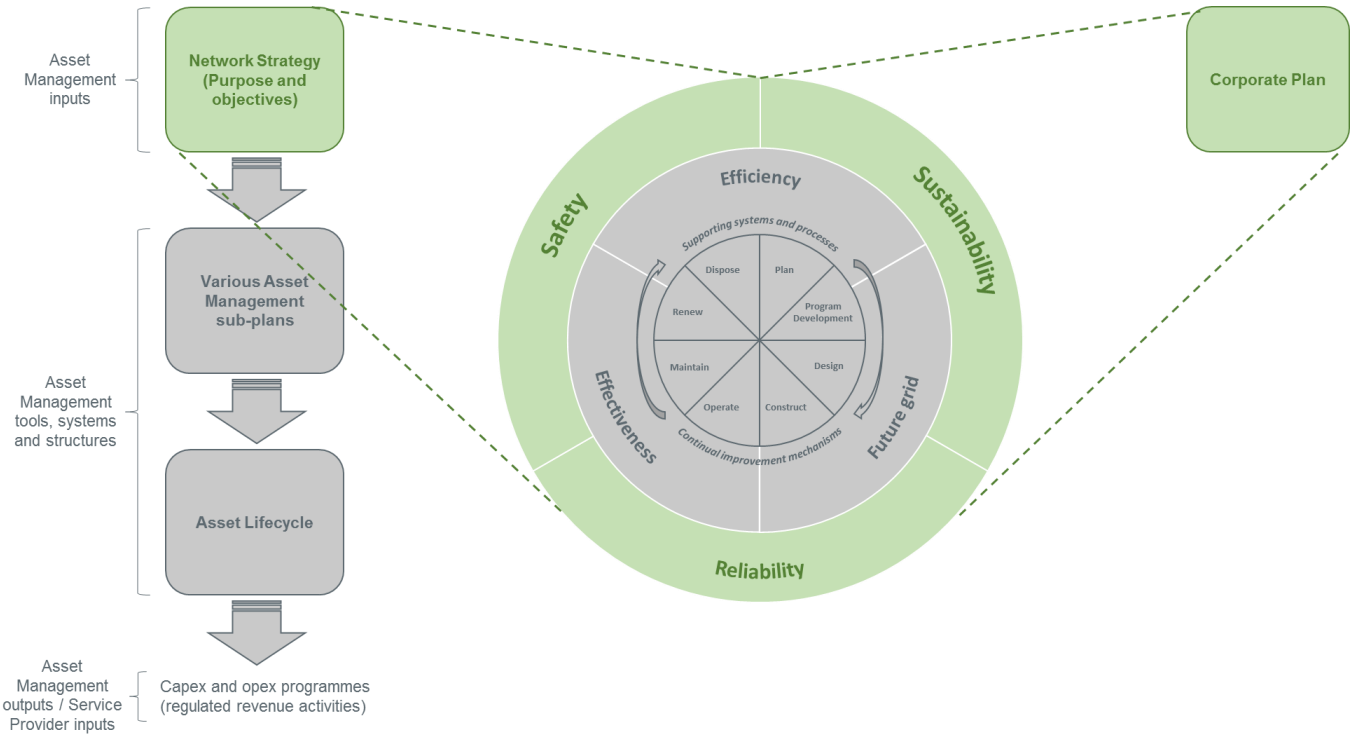

Figure 4: Purpose and objectives are captured through the Corporate Plan

The aspects of the corporate strategy that drive the Network and Asset Management are:

Corporate purpose:

To be of service to our communities by efficiently providing energy supply services to our customers in a way that is safe, reliable and sustainable

Strategic goals:

Safety: *Deliver best practice safety performance for our employees, contractors and the community.*

Reliability: *Maintain the reliability, security and sustainability of the network.*

Sustainability: *Ensure our business is sustainable by making it efficient, affordable and competitive so that it can meet future challenges.*

3.2 BUSINESS ENVIRONMENT

Endeavour Energy has a strong performance history regarding safety and reliability, and is effectively continuing its efforts in these areas. Endeavour Energy also performs well on sustainability measures, although increasing efficiency is a key industry-wide focus area, with pressure from customers and the Australian Energy Regulator (AER) to reduce the cost of service delivery to reduce the price to consumers. We have been benchmarked by the Australian Energy Regulator (AER) and sit within the efficient band of Distribution Network Service Providers (DNSPs), i.e. at the lower end of the cost curve within the National Energy Market (NEM).

With the right balance now struck between efficiency and energy supply performance, Endeavour Energy is well placed to move forward with our customers in their evolving energy supply needs, particularly facilitating the uptake of embedded renewable generation and the need for energy storage. Our network will require ongoing renewal to transform it from its traditional bulk-generation to end-use supply framework to become a neural network of remotely controlled interconnections of multiple distributed generation sources, peer-to-peer energy transfer solutions, and to meet the emerging requirement for bulk and distributed energy storage.

Our asset management purpose statement is summarised as “commercial asset management” (outlined in Section 4), which captures the organisational goal of sustainability and the industry stakeholder focus of continually increasing efficiency.

The Company drives its sustainability objective through its business as usual processes via a constrained approach to asset investment. Endeavour Energy achieves this through “needs based” investment with a commercial focus, a philosophy which has underpinned its investment programs for several regulatory control periods. Examples of Endeavour Energy’s “needs based” investment approach include:

- Growth investment to meet future electricity demand applies on an “in time” rather than “ahead of time” approach;
- Planning standards at the sub-transmission level are deterministic in principle (i.e. N-1) with probabilistic methods used to determine when incremental increase in capacity is economically justified;
- Replacement based on asset condition (not simply age) with complete replacement and piecemeal (component-by-component) replacement strategies used based on site factors. Some asset types are allowed to operate until failure where the consequence of failure is low and can be safely managed;
- Modest reliability investment to address (poor) performance outliers, and justified on a service target incentive basis;
- Actively seeking the use of demand/customer side solutions where appropriate. Demand Management is seen as a credible alternative to investment and not just a compliance activity, and Endeavour Energy is recognised as a leader in this area;
- The maintenance approach for sub-transmission assets is moving to be primarily preventative and condition-based-based. Historically, this activity has been based on routine time-based maintenance intervals, but Endeavour Energy has been progressively transitioning to determining maintenance requirements based on utilisation and condition factors, and using risk and condition assessment techniques such as FMECA and RCM processes. 85% of sub-transmission asset types are now maintained using a probabilistic risk-based approach rather than a deterministic time-based approach.
- The maintenance approach for distribution assets is primarily inspection and condition based with some preventative maintenance activities undertaken when the expected failure mechanism is predictable and manageable. This too is moving to a more risk-based maintenance approach using FMECA and RCM processes. 45% of distribution asset types are now maintained using a probabilistic risk-based approach rather than a deterministic time-based approach;
- Risk based vegetation management program based on outcomes, as well as annual pre-bushfire season inspection and defect rectification;
- The overall maintenance spend has reduced over the past 5 years as a result of more targeted maintenance activities (i.e. adopting RCM and FMECA tools) as well as internal and external benchmarking to refine the Company’s maintenance approach.

Oversight and governance of the Asset Management functions of the Company, and delivery on the Corporate and Network Strategies is provided by the Executive Network Asset Management Committee (ENAMC)[2]. The activities and deliberations of this committee facilitates the closed-looped feedback process between the Asset Owner, Asset Manager, and Service Provider necessary to ensure that the corporate strategy is successfully delivered, and that the Asset Owner remains abreast of emerging issues that may impact strategic capability and business direction.

4. ASSET MANAGEMENT STRATEGY

The Network Strategy describes Endeavour Energy's "vision" for the network to fulfil the objectives of the Corporate strategy. The Asset Management Strategy directs the asset management functions and processes efficiently deliver the Network Strategy and to effect change to "business as usual" asset management system (AMS) processes.

The premise of the Asset Management Strategy is to enhance Endeavour Energy's "commercial" asset management approach. This vision is based on a platform of historically sound asset management and engineering capability that underpin Endeavour Energy's business as usual processes, combined with a highly skilled and experienced workforce that fully understand the assets under management.

The vision is prefaced by acknowledging the challenge of adapting to anticipated changes to energy usage and subsequent changes to network requirements. Future requirements for the network are likely to be shaped by technical changes as consumers increasingly adopt distributed generation and storage, and a potential wide-spread transition to electric vehicles. These changes must be managed in the face of increasing efficiency expectations from industry regulators, customers and shareholders alike.

The delivery strategy is aligned with the principles of delivering a network outcome that is safe, reliable and sustainable. The commercial asset management approach has three strategic focus areas, viz:

1. *Preparing the network for future grid requirements through the commercially efficient provision of network-connected energy services.*
2. *Asset management effectiveness, which aims to deliver the required network performance at least cost to customers (i.e. commercial network management); and*
3. *Efficiency and service delivery, which aims to deliver workforce optimisation productivity improvements.*

Table 1 provides an overview and details the three strategies and underpinning initiatives from the Asset Management Strategic Plan.

[2] The function of this committee and its role in the Asset Management process is further explain in Section 6.

Table 1: Asset Management Strategy – Key Initiatives

Purpose	***To apply better practice asset management principles and deliver value for customers and appropriate returns for our shareholder, without compromising safety and reliability – Commercial Asset Management***		
Strategic focus	**Future Grid**	**Asset Management Effectiveness**	**Efficiency and service delivery**
Objectives	• Integrate supply side and demand side technology into a system that meets business and customer needs.	• Deliver the required network performance at least cost to customers. • Develop flexible and dynamic workers who add value to our customers	• Be at the efficient frontier in the 2019 determination; • Continue the pathway to zero LTIs by 2020;
Key initiatives	• Prepare the network to integrate with alternative energy sources and changing usage patterns (embedded generation, microgrid, electric vehicles, battery storage, retailers undertaking Demand Management, internet of things) ○ Develop deployment and implementation options and decision triggers for network battery investment that will reduce network infrastructure costs and enhance Endeavour Energy's reputation. (refer Commercial Plan) ○ Develop deployment and implementation options and decision triggers to support the market for electric vehicles and promote Endeavour as an enabling platform and strategic partner. (refer Commercial Plan) • Explore and utilise new technology to improve network performance or efficiency (e.g. microgrids in rural areas / batteries for load control/ reliability)	• Embed the asset manager / service provider structure into organisation systems and processes • Further develop an understanding and management of risk across the capital and operating portfolio ○ Further opportunities for FMECA ○ Benchmarking of delivery performance ○ Market testing ○ Work packaging (internal and external) • Transition to a new regulatory framework under IPART, including the ISO 55001 implementation, Environmental code of practice, ISO 14001 implementation, WHS requirements. (incl. Fleet/Property) • Effective management of network reliability to achieve STPIS neutral outcomes • Develop and implement a policy for low voltage planning. • Data vision and management (viewing data as an asset) ○ Improve data capture processes ○ Continue easement management program • Addressing the increasing cyber security risks • Managing bushfire risk post NSW Coronial Enquiry • Embed a process for identifying and managing easement encroachment issues • Implement fleet strategy and management initiatives. Contribute to the development of improved supply chain performance.	• HSE Strategic Plan • Productivity Strategy • Field Service Centre Strategy • Fault & Emergency Strategy • Workforce Strategy

5. ASSET MANAGEMENT OUTCOMES

Endeavour Energy adopted an Asset Owner – Asset Manager – Service Provider business model in 2016 for enhanced governance, management and delivery of the core network-business functions. This business model is an evolution of the Company's previous business model and is accepted best practice.

The 2009 to 2014 regulatory period required the delivery of an unprecedented volume of capital investment in the Endeavour Energy electricity network. The previous business model enabled a rapid increase in program delivery to successfully deliver the construction works. Its structure separated the governance, project and program management, and external and internal service delivery. The model allowed focus on building capability in portfolio and program management, with the introduction of external service delivery for works that had previously been undertaken solely with the internal workforce (the "peak delivery" model). It also provided for significant reforms within the internal service delivery group and its capability.

Endeavour Energy's delivery management capability has now peaked with this business model, facilitated in particular through enhanced governance, and the blending of internal and external delivery resources. With the capital investment peak now delivered, the Company has identified through its ongoing business transformation program the need to further refine and refocus its business model to enhance the our strategic and operational asset management and program delivery capability to meet the challenges of the current and future business environment.

By transitioning to the present model, Endeavour Energy is in the best position to meet the challenges of the future. Further, the substantial progress in asset management capability demonstrated over the past few years facilitates this transition occurring without significant business disruption as it builds upon the asset management capability already in place, much of which being aligned to the elements of ISO 55001.

5.1 ASSET MANAGEMENT PERFORMANCE

Endeavour Energy has traditionally operated low on the cost curve as evidenced by the AER's April 2015 Determination, where the AER's analysis showed we are positioned at the efficient frontier. This has been achieved through an ongoing program of reform and transformation over the last 6-8 years where the drive for cost efficiency is considered part of the organisation's culture. The current transformation program is focussed on positioning the organisation for the next regulatory reset and beyond.

There is now an embedded culture within the organisation that enables the ready identification of peak-resourcing versus base work-load needs, which enables Endeavour Energy to flexibly respond to changing business environments in the most efficient way. The delivery of capital and operating program milestone targets have been achieved or exceeded on a regular basis.

Efficient and successful asset management outcomes are delivered through the implementation of a closed loop process which incorporates ongoing feedback. This feedback operates both centrally and de-centrally, with the sub-transmission and major distribution networks being managed centrally, whilst the balance of the distribution and low voltage networks are generally managed through the application of centrally set policies and tactical implementation managed through a de-centralised model. A comprehensive suite of network policies, procedures, standards and technical bulletins are in place to facilitate this.

Asset condition and performance data, collated through asset class plans, is used to inform centralised investment decisions on the sub-transmission network and for major distribution asset categories. These decisions are further optimised through our strategic investment planning processes. Tactical asset management decisions in the distribution and low voltage networks are based on the local knowledge and experience of field officers, in accordance with programs developed through the centralised analysis of condition-based needs. With a major focus on improving asset data acquisition and quality, this model is expected to evolve and improve further.

Workforce needs have been successfully managed through the period of recent peak investment periods by a combination of a minimal increase in internal resources coupled with a delivery strategy resourced from the external market. With the subsequent significant reduction in the capital program the workforce model has been sustainably readjusted in size, however this has been achieved by retaining key technical skills and capabilities and supplementing these with market-based specialist skills or generic resources as required. In addition, to facilitate the change we have continued to utilise a blended delivery of internal/external resources for current programs.

Significant workforce efficiencies have been achieved, although ongoing efficiency improvement is required to meet the challenges of the future. Notwithstanding this, Endeavour Energy in a position to harness our skilled resources to grow the business by providing a service to new customers where it makes commercial sense to do so.

5.2 PERFORMANCE MEASUREMENT

A key to the success of the asset management approach is the monitoring of progress in achieving the stated outcomes against targets for the various strategic objectives. Endeavour Energy constantly monitors and reviews performance through the activities of the ENAMC in order to inform the Company on the effectiveness of the asset management activities, and to provide assurance to the Asset Owner on the achievement of its strategic goals.

Consequently, at a high level, asset management performance is measured against these objectives i.e. safety, reliability and sustainability. An overview of how performance is measured against each of these elements is as follows:

Safety

The organisational strategic goal for safety is “to deliver best practice safety performance for our employees, contractors and the community”.

To measure performance against this objective Endeavour Energy intends to position in the top performing quartile for injuries and fatalities to employees, contractors and the community (as they relate to asset management activities and the network assets).

Reliability

The organisational strategic goal in relation for reliability is “to maintain the reliability, security and sustainability of the network”.

To measure performance against this objective Endeavour Energy will maintain current performance in the following areas:

- Reliability, e.g. SAIDI and SAIFI, etc.
- Security e.g. availability, utilisation, redundancy, etc.
- Sustainability e.g. age profile, health profile, risk profile, remaining life, etc.

Sustainability

The organisational strategic goal in relation for sustainability is “ensure our business is sustainable by making it efficient, affordable and competitive so that it can meet future challenges”.

To measure performance against this objective Endeavour Energy will improve current performance in the below areas (as they relate to asset management activities and the network assets):

- Efficient e.g. unit costs, other efficiency benchmarking measures, etc.
- Affordable e.g. contribution of asset management activities to electricity prices, etc.
- Competitive e.g. benchmarking of service delivery costs to other providers, etc.

5.3 ALIGNMENT WITH ISO 55000

Many of the key elements of Endeavour Energy's asset management functions meet or are well-aligned with the key elements of the ISO 55000 framework, however some gaps have been identified. Endeavour Energy is currently working towards attaining certification under ISO 55001 (the asset management system requirements that implement ISO 55000 Asset Management System principles), and hopes to achieve this by late 2017 or early 2018.

Figure 5 below shows the role of the Asset Owner against the framework, including interfaces with the Asset Manager and Service Provider. It illustrates how the Asset Owner delivers on its responsibilities through the process of establishing organisational plans and objectives. Figure 5 also shows how Endeavour Energy's asset management system aligns with ISO 55000, including interfaces and process flows between the Asset Owner, Asset Manager and Service Provider across the asset lifecycle, noting the ENAMC oversees these interfaces and process flows to assure governance.

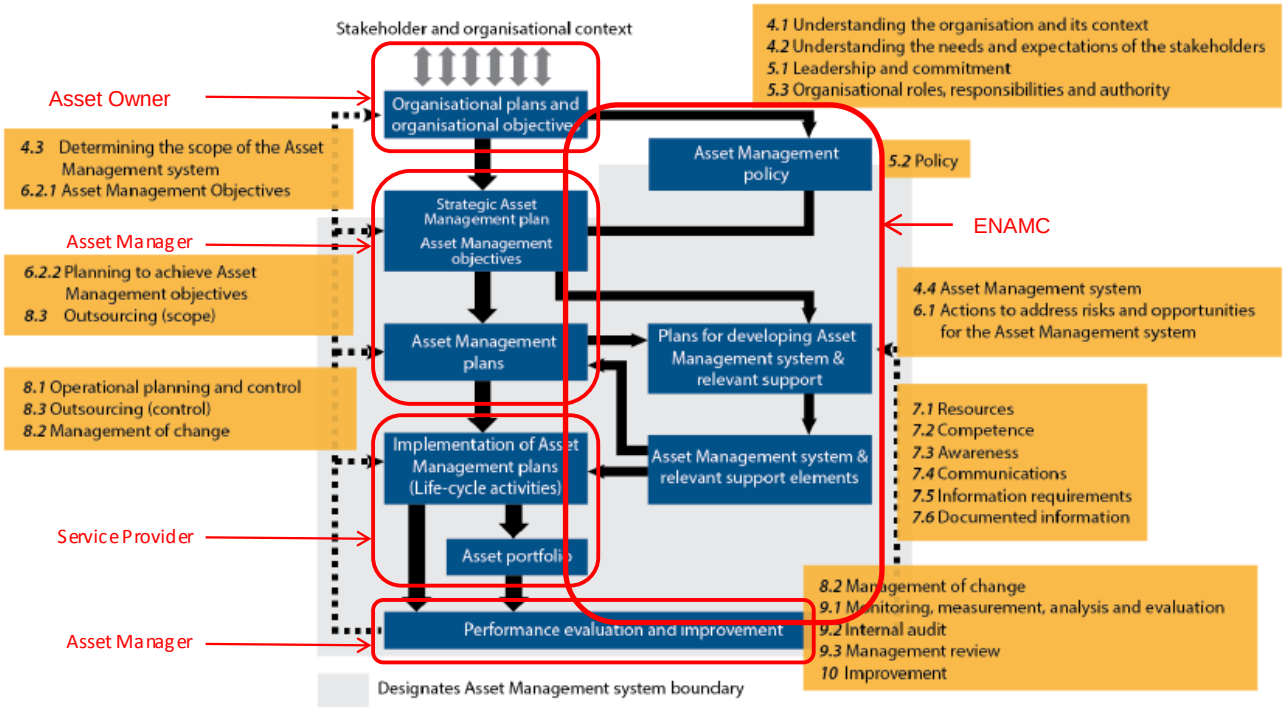

Figure 5: Asset Owner, Asset Manager and Service Provider roles against the ISO 55000 framework

The Asset Owner – Asset Manager – Service Provider business model relates to Endeavour Energy's operating model for the management of its network assets. It should be noted that this does not describe the business structure, which also includes supporting corporate support functions such as legal, HR, finance, IT, facilities, fleet etc. These functions are managed within the support divisions and not within the roles of the business model. These support groups take their strategic planning cues from the corporate plan, as well as the strategies of both the Asset Manager and Service Provider functions.

6. ASSET MANAGEMENT SYSTEM (AMS) DEVELOPMENT INITIATIVES

6.1 FUTURE ASSET MANAGEMENT REQUIREMENTS

The current model will continue to evolve over time in line with the development of the asset management maturity of the business. This evolution will be based the need for transformation of the technical asset management capability of the business, and of the asset information and support systems necessary to enhance this capability.

Moving forward a more mature and data informed asset management approach will be required to enable better asset decisions without materially compromising overall network risk or our position on the efficient cost curve.

To enable this there is a need to:

- Put in place any necessary processes, tools and skills to better understand our network asset risk profile for both individual asset types and their impact on overall network performance; and
- Effectively implement the resulting investment and maintenance programs and initiatives using the most efficient and appropriate resource model.

Endeavour Energy has a record of accomplishment of lean asset management coupled with a strong strategic approach to ensuring efforts are appropriately targeted to achieve optimal long-term outcomes for the network. Notwithstanding this, it is recognised that the Company's AMS has not reached full maturity. Endeavour Energy is however committed to continuous improvement along the asset management journey.

A key initiative under the "Asset Management efficiency and effectiveness" strategic focus is to achieve certification against the international standard for asset management (i.e. the ISO 55000 series). As part of this process, an independent review of our asset management system was commissioned in order to inform the development journey.

This gap analysis was tasked specifically to identify weak points that will need to be addressed to achieve certification. As a consequence, the key weak points in the AMS have been identified and are understood, and there is a strong commitment to implementing initiatives to enhance the AMS through the Company's various business transformation initiatives.

A summary of the gap analysis against the clauses of ISO 55001 is provided in Table 2[3]. Notably, Endeavour Energy has been assessed as strong in AMS elements relating to "the business of managing the assets", but displays some weakness regarding defining, documenting and formalising the AMS and its processes. Many of these weaknesses had already been identified and are currently targeted for improvement through the various initiatives in the Company's transformation program, of which the Asset Management strategy is key.

[3] AMCL, Asset Management – High-Level Gap Analysis Report, April 2016

Table 2: Summary of compliance assessment against the ISO 55001 Clauses[3]

Assessment	ISO 55001 Clause	
	Clause description	Clause number
Compliant	• Understanding the organization and its context	4.1
	• Understanding the needs and expectations of stakeholders	4.2
	• Resources	7.1
	• Operational planning and control	8.1
	• Management of change	8.2
	• Outsourcing	8.3
	• Nonconformity and corrective action	10.1
	• Preventive action	10.2
	• Continual improvement	10.3
Compliant with improvement required	• Determining the scope of the Asset Management System	4.3
	• Asset Management System	4.4
	• Leadership and commitment	5.1
	• Organizational roles, responsibilities and authorities	5.3
	• Actions to address risks and opportunities for the Asset Management System	6.1
	• Asset management objectives and planning to achieve them	6.2
	• Competence	7.2
	• Awareness	7.3
	• Communication	7.4
	• Documented Information	7.6
	• Monitoring, measurement, analysis and evaluation	9.1
	• Internal audit	9.2
	• Management review	9.3
Non-compliant	• Asset Management Policy to reflect and embed AM objectives and principles	5.2
	• Information requirements, especially asset data control & integrity	7.5

The recommended areas of focus for improvement from the gap analysis are provided in Table 3. Recommended areas of focus for AMS improvement[3] below.

Initiative	Recommended Improvement
1	Modification of the Asset Management Policy to align with requirements from ISO 55001.
2	Defining and strengthening the Asset Management System. Ensure internal and external staff are aware of the Asset Management System and how they interact with the system.
3	Aligning people's understanding of the core concepts of Asset Management, the breadth and depth of which should correspond to the individuals' roles and responsibilities.
4	Coordination and buy-in for Asset Management improvement activities across the business, with an increased focus on generating a team based culture within and between the two network divisional structures 'Asset Management' and 'Network Services'.
5	Embedding the Asset Owner – Asset Manager – Service Provider asset management organisational model recently implemented (March 2016).

Initiative	Recommended Improvement
6	Increasing the transparency of the Business Objectives and KPIs through their alignment to the Organisational Model. An increased understanding of how business units contribute to the overall business objectives is required.
7	Strengthening processes around data capture and usage.
8	Produce an IT strategy and in parallel develop an Asset Information Strategy which aligns to the requirements of the Asset Management System.
9	Expansion of the Executive Network Asset Management Committee role to cover the management review of the Asset Management System once developed and implemented.

Table 3. Recommended areas of focus for AMS improvement[3]

Endeavour Energy is committed to addressing the issues identified through the gap assessment process and to achieving certification of its Asset Management System to ISO 55001 standard, which now a NSW licence requirement. As such, an implementation plan to achieve this is currently being implemented with a view achieving certification by late 2018.