evoenergy

Appendix 3.4: Network asset management plan

Access Arrangement Information

ACT and Queanbeyan-Palerang gas network 2026–31

Submission to the Australian Energy Regulator

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Asset Management Plan

Authorisation

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EXECUTIVE SUMMARY

This Asset Management Plan (AMP) outlines how Evoenergy's ACT Gas Network, including the Queanbeyan and Bungendore networks will be managed. Further, it provides information about how the network assets will be managed to continue to provide a safe, reliable and affordable gas supply to our customers.

Our asset management practices and strategies inform the expenditure plans and programs of work and are key inputs into the forecast expenditure program for 1 July 2025 to 30 June 2032, "the forecast period".

In summary, over the period, we plan to:

- replace almost 33,000 residential and commercial gas and water meters;
- confirm the presence of pipeline protection (eg: concrete slabs) along the Canberra primary pipeline to effectively manage the safety risks associated with encroaching dwellings on the pipeline;
- undertake key inline inspection ('pigging') activities of the high pressure pipelines including integrity digs of the Canberra Primary Pipeline and to validate recent pigging results;
- rectify and upgrade internal piping, meters and regulators within shopping centres to lower the safety risk;
- upgrade high pressure facilities to adhere to E&I Compliance requirements; and
- carry out a corrosion mitigation program at the high pressure facilities to maintain network integrity.

This is not intended to be an exhaustive list, nor does it include all ongoing corporate or non-asset management related costs/projects we plan to deliver over the next seven years. Asset management requirements are continually reviewed and will likely change over the course of program delivery. The forecast works program also includes ongoing maintenance, provision for reactive asset replacement, and other minor works not included in the summary list above.

ISO 55001 Accreditation

The asset management approach for Evoenergy (and the Asset Management System (AMS) that underpins it) has been externally audited and accredited as conforming to the requirements outlined in the international standard ISO 55001. In keeping with ISO 55001, we focus on the value assets provide to both Evoenergy and its customers and aim to balance risk and safety performance against reliability, customer expectations and cost.

Continual improvement practices are built into our AMS and decision-making process. We do this by regularly reviewing and improving the asset data, the systems that hold our data, and the way we apply that data in our investment decisions. As a result, we are continually refining and enhancing our asset management capabilities, which in turn leads to more fully informed and prudent expenditure forecasts.

Climate Change Policy

Our asset management decisions are shaped by our operating environment and by consumer feedback. The Australian energy market is changing with the onset of technology, changes in environmental policy and the increasing competitiveness of renewable energy resources. As a result, the way customers use natural gas and the gas network itself are evolving and will continue to do so over the coming decades.

A focus of our planning is the ACT Government's climate change policy, which involves a legislated target for the ACT of achieving net zero greenhouse gas emissions by 2045. Evoenergy supports a responsible transition to achieve this target.

Achieving net zero greenhouse gas emissions while providing energy to customers that is safe, secure, reliable and affordable, involves solving major strategic, technical, social and operational issues. We will support the continued collaboration with the ACT Government, technical experts, the gas user community, and industry to thoroughly investigate available options and choose a pathway to net zero emissions that ensures consumers continue to have access to energy that meets their needs, minimises costs and ensures we are equipped for the future.

Outcomes of Our Asset Management Plan

Over the 2026-31 Access Arrangement period, Evoenergy will continue to limit expenditure as we work with the ACT Government to achieve climate change policy targets while still continuing to provide safe, secure, reliable and affordable energy services.

We will measure our asset management performance against our suite of asset safety, reliability and customer service key performance indicators (KPIs), detailed in Chapter 7 of this AMP.

1. INTRODUCTION

We believe sound asset management and governance processes are essential for prudent and efficient investment in the gas distribution network. Perhaps more importantly, having sound asset management and governance processes allows us to maintain a safe, reliable and affordable gas supply, and ensure the services we provide are consistent with the expectations of customers in and around the ACT.

The purpose of this AMP is to provide an overview of how we manage our assets and our business. Our aim is to demonstrate that our asset management activities are based on good practice and driven by need, which help ensure our work program and expenditure forecasts are both prudent and efficient.

1.1 SCOPE

This AMP covers the ACT Gas Network's assets excluding supporting assets such as Information Technology systems and Corporate services (including training) as detailed in the Capital and Operational Work Plan (COWP).

Jemena has developed this AMP and the supporting asset class strategies for Evoenergy's ACT gas network and non-network assets. The Asset Class Strategies define the specific asset and risk management activities for each type of asset. The AMP summarises the high-level asset management activities required to meet asset and organisational objectives.

The AMP identifies operating and capital expenditure for the next seven years. The AMP is supported by the COWP, which provides additional information on the first two-year expenditures required to implement the AMP.

1.2 ABOUT EVOENERGY

The ACT Gas Network was commissioned in 1980s and was extensively developed through the mid-1990s and has continued to grow. It now has almost 5,000 km of pipelines that distribute natural gas to more than 150,000 homes and businesses.

Evoenergy transports gas through the network on behalf of network users (such as retailers) to customers' premises. Jemena builds and maintains the network on behalf of Evoenergy and we also install, read and maintain the meters that measure how much gas is being used by each customer

Natural gas is supplied to the ACT Gas Network via two high-pressure gas transmission pipelines.

- The Dalton to Watson Pipeline in the north, owned by the Australian Pipeline Trust (APA) – part of the APA group listed on the ASX. This is a lateral of the Moomba to Sydney Pipeline (MSP). The MSP also transports natural gas from Moomba, South Australia and Queensland across NSW. Natural gas is received from the Dalton to Watson Pipeline into the ACT network through the Watson Custody Transfer Station (CTS); and
- The Eastern Gas Pipeline (EGP) in the east, owned by Jemena Limited. The EGP transports gas from Longford in Victoria through NSW to the Sydney Market. Natural gas is received from the EGP into the ACT network through the Hoskinstown CTS. Gas then flows into the Hoskinstown to Fyshwick Pipeline owned by Evoenergy, and the pipeline up to the ACT/NSW border is covered by Licence 29 under the New South Wales Pipelines ACT 1967. The remaining section of the pipeline situated in the ACT operates under the Utility Services Licence.

Figure 1–1: Evoenergy's ACT Gas Network

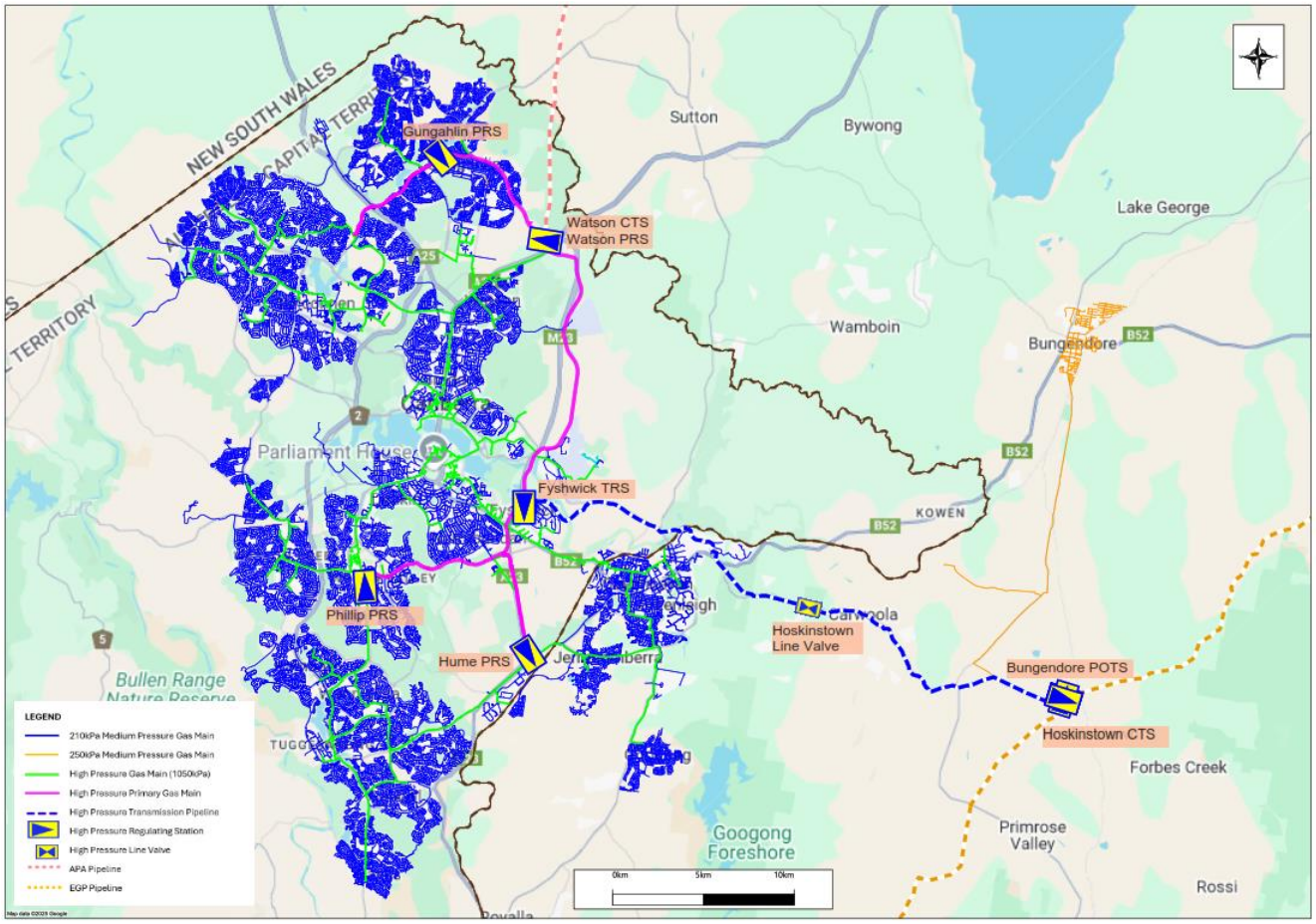


Table 1-1: Key ACT Gas Networks asset statistics[1]

Network	Quantity
Trunk mains (km)	30
Primary mains (km)	43
Secondary mains >=1,050kPa (km)	228
Medium pressure mains < 1,050kPa (km)	4,497
Custody transfer stations (CTS)	2
Trunk receiving stations (TRS)	1
Primary regulating stations (PRS)	4
Secondary district regulator sets (SDRS)	96

[1] Data extracted from GIS actuals March 2025.

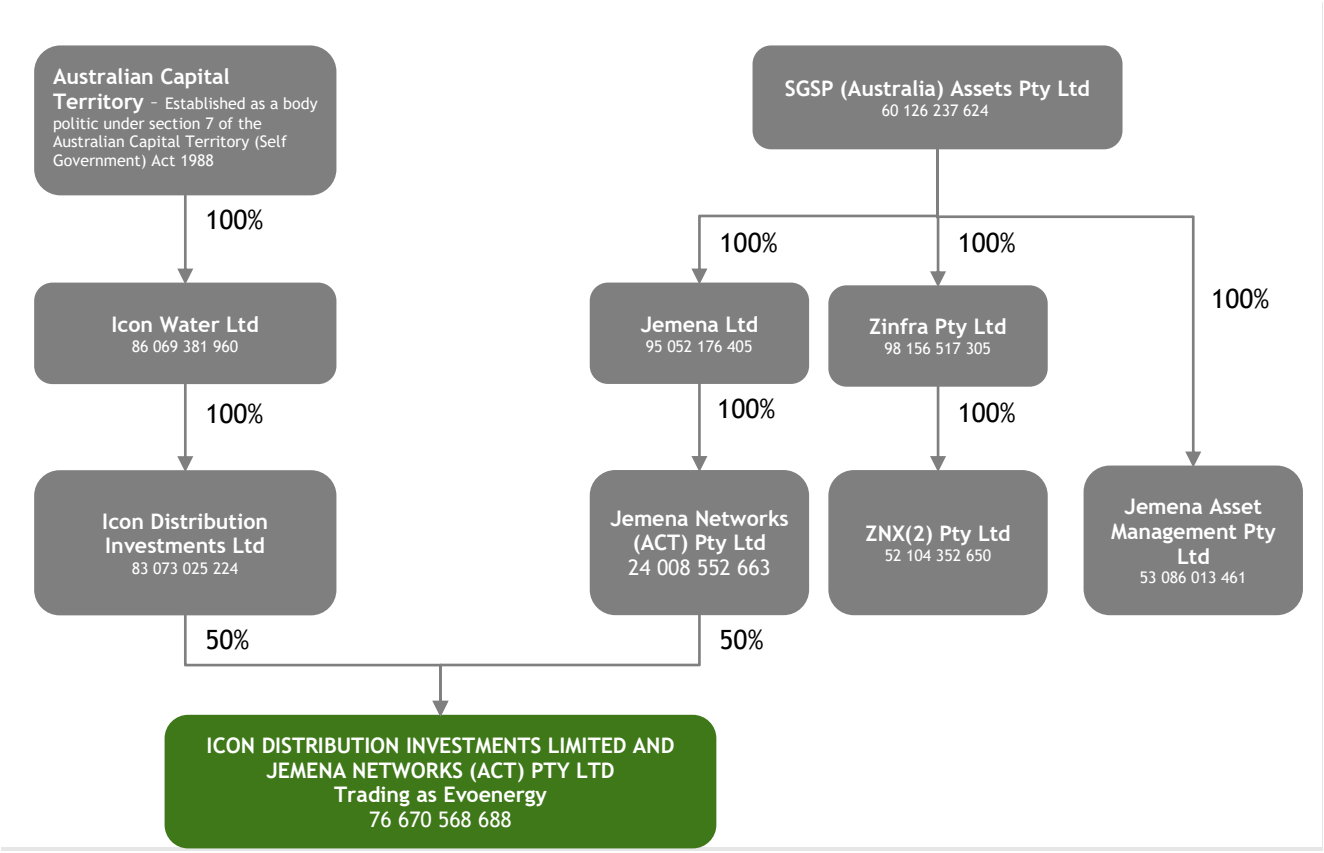
1.2.1 EVOENERGY OWNERSHIP

Jemena Networks (ACT) Pty Ltd, a subsidiary of Jemena Limited, has a 50 percent interest in the Evoenergy partnership. Jemena is a privately held entity that owns and operates a diverse portfolio of energy and water transportation assets across the east coast of Australia. The remaining 50 percent interest of the partnership is held by Icon Distribution Investments Limited, a subsidiary of Icon Water Limited. Icon Water Limited is an ACT government-owned company with assets and investments in water, wastewater, electricity, gas and telecommunications.

Asset Management services and Asset Services are provided to Evoenergy by Jemena Asset Management (JAM) Pty Ltd through the Distribution Asset Management Agreement (DAMS). Asset services are provided to JAM through a service agreement with Zinfra and a series of other contractors.

The partnership approach leverages Jemena's significant expertise in managing gas assets. Jemena builds, owns and manages a portfolio of major electricity, gas and water assets. With over 1,300 employees across the country, Jemena manages more than $11 billion worth of Australian utilities assets and specialises in gas transmission and distribution as well as electricity distribution.

Figure 1-2: Evoenergy Distribution Partnership-Ownership Structure



1.3 OPERATING ENVIRONMENT

The operating environment and stakeholder expectations are crucial inputs into how Evoenergy operates and invests in the network. The ACT Government has as part of its policy to phase the gas network out by 2045 has passed legislation to ban new natural gas connections[2] [3]. Additionally, the Australian energy market is changing with the onset of technology and the increasing competitiveness of renewable energy resources whichwill also influence the way customers use gas and the gas network over the coming decades.

We constantly monitor changes and emerging trends in the energy sector to help shape our investments and services. This allows Evoenergy to remain a commercial and competitive business that provides customers with products they want and value, and provides reasonable returns for shareholders seeking long term stable cashflows.

External factors that impact our business are:

- regulatory and legislative environments;
- market trends and competitive position;
- consumer and community expectations;
- expectations for return on investment; and
- innovation and technology.

The following sections summarise current and emerging trends across these categories. These trends inform our asset management activities.

1.3.1 REGULATORY AND LEGISLATIVE ENVIRONMENT

As described above, the ACT Government has passed legislative changes that will end the use of gas in the ACT by 2045. This is the single biggest impact to the ACT gas market since its inception. During the transition to net zero, Evoenergy remains governed by a range of technical, safety, economic and environmental regulations and legislative instruments. It must also comply with its gas distribution licence requirements. Regulatory compliance is an important investment driver, not only from a safety and operational excellence perspective, but also in terms of reputational risk. Compliance with various regulatory obligations has a direct impact on corporate reputation and our ability to attract investment. We therefore factor shareholder's compliance expectations into our reputational risk threshold and asset management strategies accordingly.

An overview of the key regulatory obligations affecting investment in the ACT gas network is provided below.

- **Technical and safety** – The ACT gas network (including Queanbeyan & Bungendore) is governed by both ACT and NSW technical regulations. The ACT Environment and Planning Directorate (EPD) regulates operation and maintenance of the gas distribution network in the ACT and empower the EPD to regulate technical compliance to the Utilities Act 2000 and Utilities (Technical Regulation) Act 2014 .

[2] Refer ACT switching from Gas

[3] Refer ACT Climate Change Strategy

The NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) regulates the design, construction, operation and maintenance of the gas distribution network and transmission pipelines in NSW. It empowers the DCCEEW to regulate technical compliance to the *Gas Supply Act 1996, Gas Supply Regulation 2022*, *Pipelines Act 1967* and *Pipelines Regulation 2023*.

These regulations impose a significant number of obligations on Evoenergy relating to metering, asset safety, compliance and reporting. To remain commercially competitive, we must continue exploring opportunities to meet the minimum specifications and standards without compromising economic, environmental or customer requirements. We will work within the safety and technical framework to reduce costs to customers through efficient asset lifecycle management.

- **Economic** – Evoenergy operates under the National Gas Law (NGL) and the National Gas Rules (NGR). Satisfaction of the National Gas Objective in the NGL, and the NGR tests for conforming capital expenditure under rule 79 and efficient operating expenditure under rule 91, are key considerations in all its investment planning.
- **Environmental** – The ACT Government has passed legislation to reduce emissions in the ACT and achieve zero net greenhouse gas emissions by 2045, with several interim targets[4]. The overarching strategy has a range of actions across multiple sectors, including incentives to switch from gas to electric appliances, electrifying Canberra, and programs offering rebates to businesses to electrify.
- **Legislative Compliance** – Compliance with legislation is managed using a compliance management system operated by the Asset Risk & Assurance Group, Future Networks. The compliance management system comprises of the Safety and Operating Plan, Pipeline Management Plan, regulatory audit planning and implementation, internal audit planning and assurance activities, audit action tracking, regulatory reporting and compliance and risk management.

1.3.2 MARKET TRENDS AND COMPETITIVE POSITION

Demand for natural gas in the ACT had been strong for many years, particularly within the residential market, when coupled with the natural gas' position as a competitive alternative to electricity, the natural gas network provides an important and valued service to customer

While natural gas remains commercially competitive and desired by customers, the economic advantage natural gas has over electricity in the residential sector has reduced in recent years. The following key trends are impacting the ACT gas market:

- **Ban on Gas Connections** - All new gas connections (residential & commercial) have been banned by ACT Government Legislation from the 1st March 2024, meaning all new buildings should be designed and built all-electric. Limited exceptions can still apply and be granted by the Government.
- **Estate Development Codes** – The previous mandatory requirements for gas connections in new suburbs has been removed, to encourage a shift from gas to electricity in new suburbs supporting all-electric builds and electric appliance upgrades. Since this introduction, Evoenergy has discontinued construction of gas mains in New Estate areas within the ACT, although still applicable to the NSW area of the network such as Queanbeyan and Jerrabomberra.
- **Lower consumption per household** – Residential gas customers are using less gas due to partial or full electrification of existing appliances.

[4] Climate Change and Greenhouse Gas Reduction Act 2010 (ACT).

- **Building Regulations** – Changes to the Gas Network Boundary Code[5] and Gas Service and Installation Rules[6] affecting both existing and new high-rise developments and shopping centres;

1.3.3 CUSTOMER AND COMMUNITY EXPECTATIONS

Customers' needs are central to our investments and business decisions. We undertake regular customer and community engagement to understand how the way customers use our network is changing and what their future expectations are. Feedback from consumer engagement and surveys is used to:

- provide insights on customer expectations and their energy needs, which helps us develop product growth objectives;
- guide investment in our capabilities, process and systems; and
- assess the Evoenergy customers' experience and satisfaction.

1.3.4 EXPECTATIONS FOR RETURN ON INVESTMENT

It is vital Evoenergy has a long-term sustainable cost structure and a pathway to achieving net zero greenhouse emissions in the ACT by 2045. This will ensure the business remains commercially viable that will enable us to continue to operate the network safely and efficiently into the future.

Strategies for expenditure in the Evoenergy gas network include:

- shortening the investment horizon where supported by customers, with a focus on reducing capital expenditure and minimising Evoenergy's asset base;
- reducing cost intensity of current investments, and incorporating changes in design standards or deferring spend (where it is safe and prudent to do so); and
- accelerating the recovery of new investment for some asset categories with the aim of reducing the stranding risk associated with the ACT Government's climate change strategy.

1.3.5 INNOVATION AND TECHNOLOGY

Australia is moving towards a low carbon future and the ACT is the first state or territory to legislate achieving net zero greenhouse gas emissions across all sectors by 2045. Digital technologies are advancing providing both customers access to more data and control over their energy usage, and more efficient asset management solutions. With this in mind, the key strategies we are pursuing are summarised below:

- **Leakage survey** – Improved monitoring to better identify leaks and quantify gas escapes from the network is being implemented through the adoption of Picarro vehicle mounted surveying equipment. This will enable the data capture of leak quantification and location, to prioritise rehabilitation expenditure.
- **Cognitive Integrity Management (CIM) Tool –** a cloud based solution utilising machine learning to analyse**,** manage and present integrity data collected from in-line inspections of high-pressure pipeline assets. Enables more accurate identification of risks and more efficient deployment of funds for further investigation and repair.

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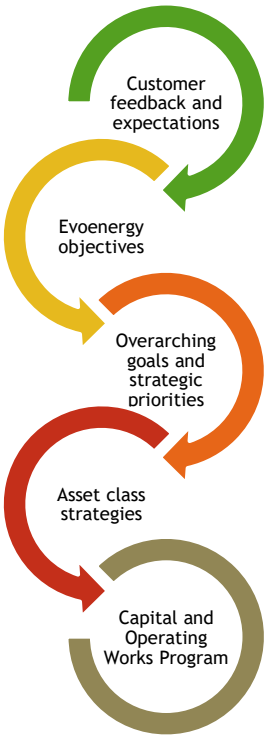
5 Refer Utilities (Technical Regulation) (Gas Network Boundary Code) Approval 2018

6 Refer ACT Gas Service & Installation Rules [https://www.evoenergy.com.au/developers/service-and-installation-rules]

2. ASSET MANAGEMENT SYSTEM OVERVIEW

As outlined previously, Evoenergy has engaged Jemena to provide management and operational services for the gas network. As part of this engagement, Jemena develops in consultation with Evoenergy, an Asset Management Plan (AMP) and supporting Asset Class Strategies, utilising Jemena's asset management system (AMS**).** The AMS describes the inter-linked processes that support decision making throughout the asset life cycle. The AMS is the framework for our structured and systematic asset management approach. The AMS creates line of sight from Evoenergy's Objectives, asset class strategies to the Capital and Operating Works Program.



We take direction from the Evoenergy Business Plan and combine it with feedback and insights from customer expectations. These inform our asset objectives and shape how we aim to manage the network in an evolving energy market. Asset objectives are then used to develop asset class strategies, which define how we will manage each type of asset in the ACT Gas Network.

ISO 55000 Accreditation

Our AMS has been externally audited and accredited as conforming to the requirements outlined in the international standard ISO 55000. The ISO 55000 series of standards (55000, 55001 and 55002) defines an asset as an item, thing or entity that has potential or actual value to an organisation. Asset management is defined as the co-ordinated activity of an organisation to realise value from assets.

In keeping with ISO 55000, our asset management approach focuses on the value the asset can provide to Evoenergy and its customers. The value of an asset (which can be tangible or intangible, financial or non-financial and include risks and liabilities) is defined by the organisation (Evoenergy) and its stakeholders (customers, investors, shareholders).

Stakeholders can have very different and potentially conflicting expectations. We therefore make trade-offs to maximise the value of assets within the bounds of customer service performance, technical performance, funding availability, and regulatory constraints. These trade-offs include the difference between short and long-term goals, and, the balance between risk, cost and performance. We also consider the conflict between procurement costs for new capital items versus ongoing operational and maintenance costs.

As per the requirements of ISO 55000, we build continual improvement practices into our AMS and decision-making process. We do this by regularly reviewing the asset data available to us and identifying how we can improve the quality of our data, the systems that hold our data, and the way we apply that data in our investment decisions. As a result, we are continually refining and enhancing our asset management capabilities, which in turn leads to more fully informed and prudent expenditure forecasts.

The AMS is a consolidation of key internal documents, drafted and presented in a way that can be used by external stakeholders to understand how our capital and operating plans conform to our obligations and requirements.

Our AMS is designed on the principles of continuous improvement and adopts the method of Plan, Do, Check and Act (see Table 2–1). This is in line with good asset management practice as defined in ISO 55000.

Table 2-1: Asset management method

Phase	Description
Plan	Two-year, seven-year and 10-year capital and expenditure horizons are developed based on assessment of performance, reliability, condition, risk and cost.
Do	Projects and programs are approved in accordance to investment planning and governance processes. Approved works are executed in accordance with approved budgets and are controlled and monitored using formal project management methodology.
Check	Key performance indicators are reviewed monthly and reported to Evoenergy and Jemena senior management.
Act	Asset management issues and risks are assessed and prioritised to inform the scope of projects and programs for the development of the next iteration of the AMP/COWP and various asset class strategies.

In addition to ISO 55000, Jemena's systems for safety, environmental, quality and risk management comply with good industry practice. We maintain accreditations for AS/NZS 4801 Occupational Health and Safety Management Systems, ISO 14001:2015 Environmental management systems, ISO 9001:2015 Quality Management Systems, and AS/NZS ISO 31000:2009 Risk Management Standard.

Compliance with good industry practice helps confirm that our asset management activities achieve a high standard and provides assurance that expenditure programs are efficient.

2.1 ASSET MANAGEMENT POLICY

Jemena produces several key policy statement documents, one of which is the Asset Management Policy. This document provides a statement about Jemena's intentions and the principals for asset management as they are applied throughout the business and on behalf of Evoenergy.

2.2 ASSET MANAGEMENT PLAN

The AMP provides strategic direction for managing the ACT Gas Network assets to deliver requirements. It details the ACT Gas Network's strategy and objectives, expenditure drivers, and network service levels (involving reliability, customer service and quality), which considers the existing performance and condition of the asset management system and assets.

The AMP establishes the linkages between Evoenergy's requirements, our Asset Management Policy and our Asset Class Strategies. It provides a guide to the ACT Gas Network's strategies, which consider existing asset utilisation, demand growth, new customer connections, existing asset performance and condition management, asset maintenance, refurbishment and replacement, and network safety and environmental risk management.

The AMP aims to:

- Identify the ACT Gas Network's strategies and objectives based on the overarching business drivers, the Evoenergy's requirements and compliance requirements; and
- Provide governance within the business by providing the relevant plans with strategic direction.

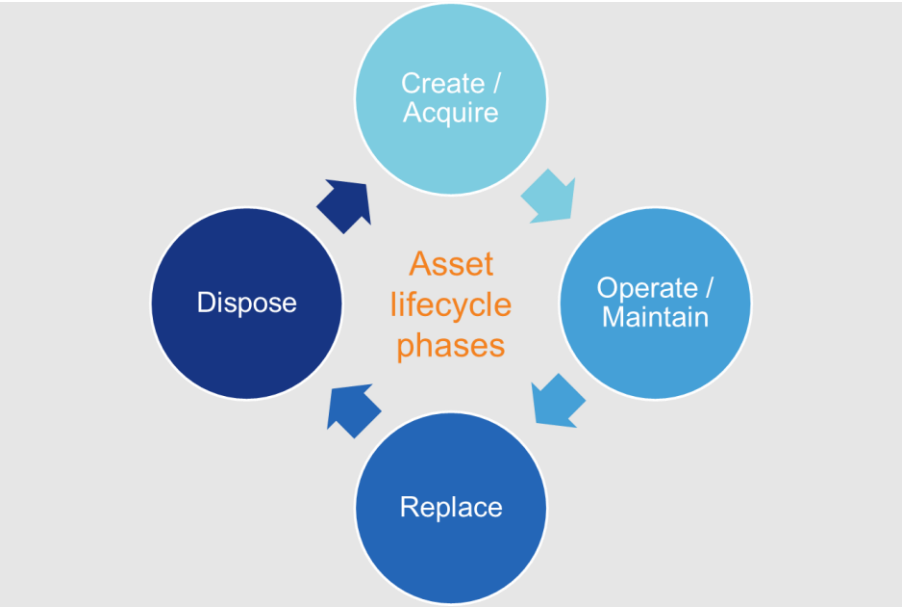
The AMP is used to inform key stakeholders about the asset management strategy for the ACT Gas Network and also facilitates the development of:

- Asset Class Strategies;
- Network Development Strategies; and
- The Capital and Operational Work Plan.

2.3 ASSET LIFECYCLE ACTIVITIES

We take a whole-of-lifecycle approach to managing assets, modifying and refining the way we manage each asset depending on the lifecycle phase the asset is in. The phases of the asset lifecycle are illustrated in Figure 2–1 and described below.

Figure 2-1: Asset lifecycle phases



- **Create/Acquire** – asset creation/acquisition involves ensuring all the specification, design, construction, procurement, commissioning and handover activities have been planned and executed, resulting in a new asset. This is typically the phase where asset installation and capacity augmentation projects are developed.
- **Operate/Maintain** – assets are used in the business to produce a range of outputs within strict quality, environmental and safety requirements and obligations. As assets deteriorate or fail, maintenance activities are conducted to keep the asset at or bring it back to desired levels of operational performance. Maintenance is conducted in full consideration of the asset life cycle to ensure excessive maintenance spend is avoided.
- **Replacement** – once maintenance activities are no longer sufficient to keep assets operating within an acceptable performance level or tolerable risk threshold, replacement of that asset (if the asset is still required) is considered. Like-for-like asset replacement or substitutes are considered as part of options analysis. Efficiency savings may also be an asset replacement trigger.

- **Disposal** – At the end of a project, or in the case of worn-out assets at the end of their lives, assets are disposed of safely, with no damage to the environment or to the communities in which Evoenergy operates.

We manage assets throughout their lifecycle in accordance with the following principles:

- define and approve asset solutions based on whole-of-life costs;
- select, create, and commission assets that are fit for purpose;
- modify or upgrade assets to increase capability and/or reduce lifecycle costs;
- operate assets to sustainable levels of performance, cost and risk;
- maintain asset costs effectively to defined performance levels;
- monitor assets to maintain their expected levels of service;
- dispose of assets in a sustainable and compliant manner;
- comply with any statutory and regulatory asset management requirements;
- focus on the continuous improvement of asset and AMS performance; and
- identify, assess, and manage asset-related risk.

3. GOVERNANCE

Governance arrangements help us deliver services efficiently and make sure we comply with legal and regulatory obligations. They ensure the regulated and unregulated parts of our business remain disparate, with no cross-subsidisation. Our governance framework helps ensure our investments are consistent with the requirements of the NGR, in that:

> *… investments are consistent with those of a prudent service provider, acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.*[7]

In terms of workflow, the four key components are:

- **Set capex program and budget** – the overall capex program and budget, taking into consideration the current business plan, market, financial and asset business strategies;
- **Project evaluation** – project initiators evaluate new investment options using defined criteria including risk mitigation, customer, strategic and financial benefits. They are also assessed against future potential market scenarios to help determine if we should progress the option any further;
- **Prioritise asset investment programs** – asset investment options are reviewed and prioritised; and
- **Prioritise corporate investment programs** – corporate investment options are reviewed, prioritised and where appropriate, approved by a prioritisation committee.

By taking this consistent approach to investment (and asset creation), we can help ensure our capex program is well balanced and subject to sufficient top-down and bottom-up rigour, which in turn promotes prudent investment decisions.

3.1 DEVELOPING ASSET MANAGEMENT ACTIVITIES AND WORK PROGRAMS

We review and update asset strategies annually to reflect any changes to the Evoenergy Business Plan and external (customer or market-driven) factors. This annual review considers:

- changes arising from the asset class strategies;
- responsibility for developing and implementing the asset class strategies and their continual improvement, including resource requirements;
- input and review processes, which stakeholders need to be considered, and what information is required for which stakeholders;
- delivery of the current program of work and any slippages or potential reprioritisation;
- interdependencies with other asset management strategies;
- levels of resources and funding available; and
- other matters, such as applicable standards or codes.

[7] NGR 79.

Expenditure forecasts are reviewed and approved through our budgeting process, and ultimately endorsed by the Board.

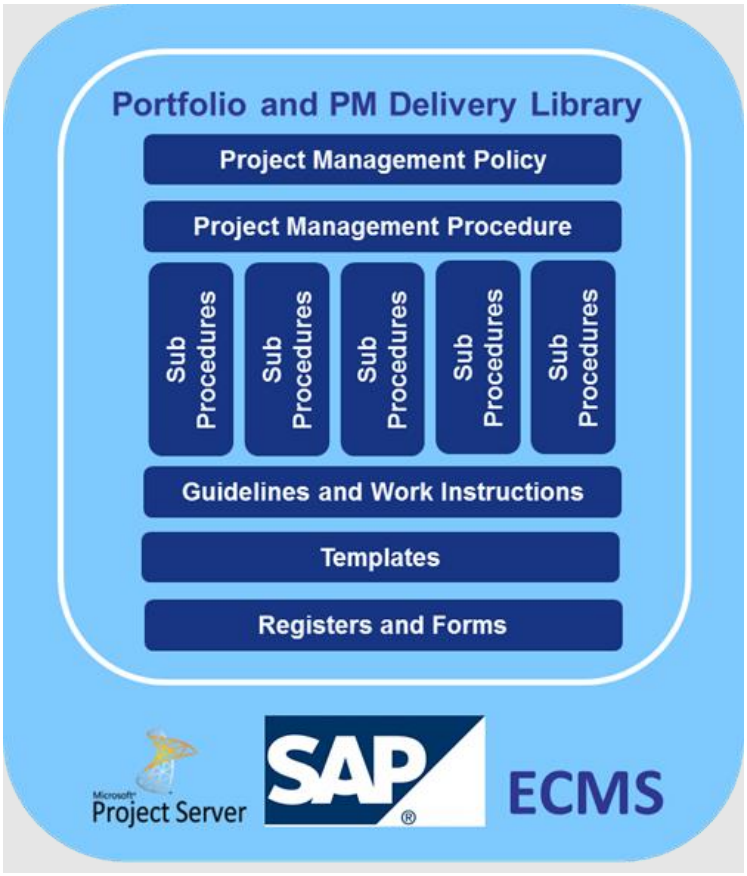
3.2 PROJECT MANAGEMENT METHODOLOGY

We adopt a standardised approach to project management across all our asset businesses. We use SAP as the repository for our project management documentation suite. This approach helps ensure a consistent level of quality and cost control when delivering projects involving Evoenergy assets.

Our Project Management Methodology (PMM) framework, illustrated in

Figure 3-1, consists of Jemena policies, processes, procedures, templates and tools to support efficient and effective project delivery. We adapt the PMM to accommodate projects of varying complexity.

Figure 3-1: Jemena Project Management Methodology Framework



The PMM has a stage-gate process to ensure investment scrutiny and promote efficient outcomes. Projects are controlled through the sequential gate process, which is summarised in Figure 3-2 and a more detailed outline is provided in Table 3–1.

Figure 3-2: Investment Framework Governance Gates

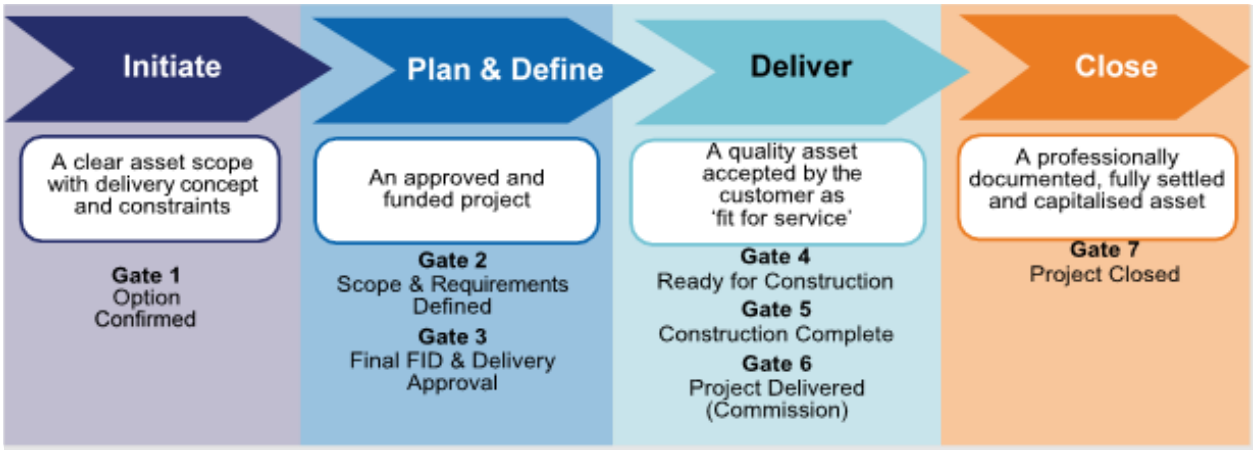


Table 3-1: PMM Stage Gate Process and Requirements

Stage gate	Description	Requirement to pass PMM gate
Project mandate	Pre gate 1 – initial options development	Issue is identified and information gathered.
Gate 1	Option confirmed	The requirement to pass gate 1 is to establish project requirements and agree on the preferred delivery option. This includes completion of an asset scope with delivery concepts and constraints.
Gate 2	Scope and requirements defined	The requirement to pass gate 2 is to conduct the relevant Front End Engineering Design (FEED) including scope feasibility confirmation and solution design. An Additional Service Request (ASR) is an approval mechanism used to seek approval of funds from Evoenergy for Jemena to continue to develop project estimates such as developing documentation or manuals and purchase of long lead items.
Gate 3	Final financial investment decision and delivery approved	The requirement to pass gate 3 is to develop designs, costings and project delivery plans to support the scope. This also involves obtaining stakeholder acceptance of designs and the cost estimate. The key output from gate 3 is the approved ASR or customer offer. The approval of these documents will identify the preferred option to be pursued and the scope of how the work will be delivered. Business Case / ASR approval within Jemena and Evoenergy is via the relevant Delegated Financial Authority Policy.
Gate 4	Ready for construction	The requirement to pass gate 4 is to finalise designs, costings and project plans to align with the scope and budget. This involves establishing project management, administration and logistics.
Gate 5	Construction complete	The requirement to pass gate 5 is to complete construction of the project, including testing. Site demobilisation will commence at this point in time. Key activities are delivery, monitoring and reporting of the construction work. The key outcome of the gate 5 review process is that all relevant documentation has been adhered to and that the project is ready for commissioning and handover.

Stage gate	Description	Requirement to pass PMM gate
Gate 6	Project delivered (commissioned)	The requirement to pass gate 6 is to commission the asset or equipment via placing into service and handing it over to the customer. The customer must confirm that all the necessary gate requirements have been satisfied during the delivery phase of the project. The key deliverable is the commissioning and handover of the project. The approval of these documents will deem the project to be commissioned, recognising that project finalisation activities will continue until the project is formally closed at gate 7.
Gate 7	Project closed	The requirement to pass gate 7 is to confirm that all the necessary gate requirements have been satisfied and to verify that the project has been formally closed. Key deliverables include the financial settlement of the project, post implementation review and a Client Acceptance Report (CAR) that confirms Evoenergy's acceptance and delivery of the project from Jemena.

3.3 PROJECT AND PROGRAM COST ESTIMATING PROCESS

In delivering cost estimates for Evoenergy, Jemena uses four key inputs to estimate project costs:

1. Actual costs of completed projects that are of a similar scope;
2. Cost estimations developed by providing a design brief and functional scope which is developed by project managers, engineering and other relevant personnel;
3. Quotations from external service providers; and
4. Industry standard benchmarks.

During the development of the Capital and Operating Works Program (COWP), for large non-routine/more complex projects, specific project estimates are developed. The estimated costs are developed by providing a design brief and functional scope which is developed by project managers, engineering and other relevant personnel. For routine or less complex projects, estimated costs are developed off previous year costs. Some of the projects are costed by obtaining quotations from external service providers (however they are mainly for projects that fall within the COWP).

These approaches ensure that various alternative options are investigated with the same rigour and transparency, in order to arrive at a recommendation for the preferred investment decision.

To maximise efficiency of resources, Jemena tries to align projects at the same location or during the same outage periods or during the same duration of time.

Jemena and Evoenergy are committed to early and rigorous community and stakeholder engagement to provide transparency and to reinforce the need for and benefits of the proposed new projects. The COWP will be continuously upgraded to be optimised using the risk ranking process and input from the community as appropriate.

3.4 DELIVERABILITY

When delivering works, we aim to keep our staff, suppliers and the public safe. This is our number one priority. While our aim is always to complete work on time and within budget, we will not compromise safety.

Our Capex and Opex work programs are assessed against available resources as part of the investment approvals process. This is done together with our maintenance programs to identify opportunities to align similar and sequential works in the same area, which can reduce customer disruption and potentially result in lower costs.

When we assess our works programs, we consider two main constraints:

- deliverability – we adjust workloads by asset class to account for potential deliverability constraints. This allows us allocate resources across portfolios more effectively; and
- available resources – we forecast the resource requirements of the works plan and adjust it as necessary to ensure efficient use of internal capacity and available funding.

For more information please refer to JEM PMM-PR-2542 Jemena Infrastructure Cost Estimation Methodology.

4. SAFETY

Evoenergy and Jemena do not compromise on the safety of our customers, the public, or our employees. We are committed to ensuring all operations are conducted in worksites that are safe from harm. Safety is the most important consideration when developing asset management strategies and associated capital investment forecasts.

We take a risk-based approach to asset management, and wherever possible ensure we are managing safety risk to as low as reasonably practicable (ALARP), at the lowest sustainable cost. We will not compromise safety over cost or service performance and are committed to maintaining and replacing risky assets within timeframes that minimise the risk of safety or supply incidents.

4.1 HEALTH AND SAFETY (EMPLOYEES & CONTRACTORS)

We apply the following key principles in the management of the health and safety performance of employees and contractors:

- every contractor must complete a gas network induction and have a signed contract that includes provisions that cover the currency of mandatory training and occupational health and safety (OHS);
- every person employed by a contractor that works on the gas network must have suitable training for the task and must have completed an induction; and
- audits are conducted to ensure compliance with industry codes and regulations.

We are committed to supporting employee health and wellbeing. Our work plan for health and wellbeing focuses on building resilience and looking at what we can do to embed healthier ways of working into day-to-day business practices.

4.1.1 REGULATORY OBLIGATIONS

Legislative obligations and internal requirements around employee and contractor health and safety are managed by line managers and supported by the HSEQ (Health, Safety, Environment and Quality) Team. Applicable legislation in this area is ACT Work Health and Safety Act 2011 and Work Health and Safety Regulation 2011 both of which are incorporated into the Jemena standards, processes and related requirements outlined in the Jemena Health, Safety and Environment Management System.

4.2 ASSET AND PUBLIC SAFETY

This section is relevant to the AMP in that all relevant lifecycle activities are designed to ensure compliance to the health and safety system and covers all Jemena employees and contractors working in/for Evoenergy and Jemena and discusses the work of the Health & Safety (HS) and Environmental Groups and their activities around health and safety.

Asset and public safety performance for Evoenergy is monitored by Jemena's Gas Safety Management Review Committee.

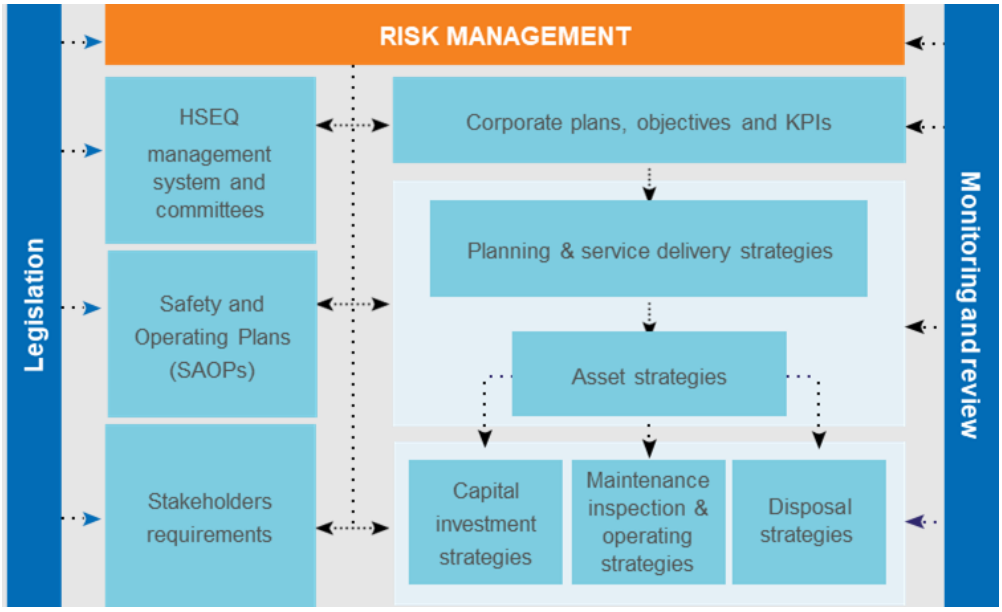
The committee will assure appropriate governance and management review over the gas asset safety cases is performed efficiently and effectively and as far as possible support 'One Jemena' method or procedure for completing common tasks.

4.3 SAFETY MANAGEMENT SYSTEM

Jemena has a detailed safety management system comprising of both asset safety and HSE requirements. It describes the processes required to ensure Jemena focuses on critical safety needs, forecasts and allocation of resources. The safety management system sets the direction for HSEQ activities and consistently delivers improved HSEQ performance across the Evoenergy gas distribution business.

Figure 5-1 illustrates the interrelationship between legislative requirements, risk management and our asset management strategies.

Figure 4-1: Safety Management System



4.3.1 SAFETY MANAGEMENT SYSTEM COMMITTEES

The Jemena governance process described above fundamentally provides the management review and assurance of gas assets.

The HSE Council provides overall HSE leadership and assists Jemena to fulfil its overall responsibilities in relation to HSE matters as they affect workers (employees and contractors), customers and the community. Membership of the Council includes the Managing Director as the Chair, all Executive General Managers and the General Manager of HS.

The HSE Council also monitors and reports on the effectiveness of strategies and practices to manage risks. The SGSPAA HSE & APS Performance Report is used to summarise any "Asset Public Safety Emerging Issues" with the information derived from the Gas Safety Management Review Committee (GSMRC).

The GSMRC oversees the following areas insofar as they relate to asset and public safety as detailed in the GSMRC charter (refer to compliance matrix for the charter). Typically the review inputs include:

- Technical specifications and allied artefacts;
- Acts, Regulations, Codes, Standards and other applicable requirements;
- Audit and incident investigations;
- Performance, integrity and condition monitoring; and
- Good industry practice, research and innovation.

The GSMRC reports to the HSE Council, the current status of the asset and public safety program and management system including:

- Performance against key performance indicators;
- Trend analysis of significant events; and
- Major incident logs and major incident review completed.

The GSMRC is supported by the AS2885 Pipeline Code Committee and the AS4645 Code Committee.

In addition to the above committees and management reviews, Jemena utilises its risk based asset management system processes such as Asset Performance and Integrity Report (APAIR) and control assessments that relate to gas safety. The control assessments include periodical evaluations and other monitoring and measurements through reported data on asset condition and performance.

Jemena also utilises OMNIA (Jemena's Compliance and Risk System) to support the assurance processes by continuous monitoring of its commitment to comply with laws, regulations and other subscribed requirements. Outputs from the management review processes may trigger a review of the safety case. The management recommends a periodic review of the safety case once every 2 years. In some jurisdiction, the safety case review / resubmission is required once every 5 years.

4.3.2 SAFETY AND OPERATING PLAN

In the ACT jurisdiction, under the *Utilities (Technical Regulation) (Gas Safety and Network Operation Code) Approval 2021*, it is a requirement to perform periodical audits on the SAOP by a nominated competent and independent auditor that has been approved by the ACT Regulator with audit reports submitted to ACT's Utility Technical Regulation Group (UTR).

In the NSW jurisdiction under the *Gas Supply (Safety and Network Management) Regulation 2022* and the *Pipelines Regulation 2023*, it is a requirement to perform periodical audits on the SAOP by a nominated competent and independent auditor with audit reports submitted to the NSW Office of Climate Change, Energy, the Environment and Water (DCCEEW).

5. ENVIRONMENT

The Jemena Environmental Management System (EMS) provides the framework to manage Evoenergy's environmental risks. Environmental risks are managed through the Group Operational Environmental Management Plan (OEMP) and the individual asset specific Annex – 4 EVOENERGY (ACT and NSW). In addition to OEMP and the asset specific Annexes, we have a range of environmental procedures that must be complied with when undertaking work for Jemena.

Our environmental objectives are to:

- conduct operation, maintenance and minor construction activities in compliance with legislative requirements;
- minimise adverse impacts to the environment;
- review and continual improvement of the OEMP; and
- monitor the performance and compliance of operations, maintenance and minor construction activities with OEMP.

Our drivers for environmental management are to:

- comply with all applicable laws and regulations;
- safeguard the environment for communities within which Jemena operates through prevention of environmental impact and the considered risk management of all activities;
- continuously improve the EMS;
- identify innovative environmental solutions for services delivered;
- ensure all significant environmental hazards and risks are identified, assessed and controlled; and
- ensure employees and contractors understand their responsibility for the environmental performance of their activities.

5.1 JEMENA ENVIRONMENTAL POLICY

Jemena maintains a Group Health, Safety, Environment and Quality HSEQ Policy, which outlines our goals and responsibilities for environmental performance. We are committed to reducing our environmental footprint. Our policy promotes reducing, recycling and reusing materials wherever we can, and the protection and revitalisation of natural habitats around our operations. Our EMS is consistent with the principles of ISO 14001, meaning we monitor and aim to reduce our environmental footprint and continuously improve our performance.

5.2 ENVIRONMENTAL MANAGEMENT PLANS

The Group Operational Environmental Management Plans (OEMPs) have been developed to support our environmental performance. The plans help ensure activities are undertaken consistently and with minimal impact on the environment.

The OEMP is prepared with reference to Jemena procedures and the Australian Pipeline and Gas Association APGA's Code of Environmental Practice – Onshore Pipelines (as revised April 2022). The OEMP is updated every three years and contains the following information:

- the Group Health, Safety, Environment and Quality HSEQ Policy;
- environmental performance objectives;
- divisional structure and responsibility;
- environmental risk (aspects and impacts) register, environmental procedures and environmental mitigation measures;
- legal requirements and the environmental assessment process;
- incident and emergency procedures;
- monitoring, inspection and auditing regimes;
- reporting processes;
- rectification/improvement processes; and
- processes for the dissemination of information.

All personnel associated with the ACT gas distribution network are required to understand and adhere to environmental requirements and their responsibilities in the OEMP.

5.2.1 IMPACT ASSESSMENTS

Environmental assessments are undertaken during the planning stages of new projects. They may also be performed if there are changes to operations that may impact on the environment.

In the ACT, Designated Areas are those which have been recognised as having special characteristics that contribute to the symbolic design, national function and landscape of Australia's Capital. Any project involving alteration to building or structures, demolition, landscaping or excavation works within a Designated Area requires approval from the NCA in the form of a Works Approval. If the proposed Project falls within the Designated Area and requires a Works Approval to be obtained. An application for a Works Approval is made via the National Capital Authority (**NCA**) website through the Works Approval e-lodgement. Minor operational or maintenance works may be exempted from needing a consent from NCA. Liaise with the NCA if required.

The level of assessment is dependent upon the nature of the activities and their potential impact on the environment. Generally, an environmental assessment covers the impact of our activities, assets and materials on the environment, as well as the need for environmental approvals, permits or licences. Mitigation measures are identified in construction environmental management plans (CEMPs) and are implemented prior to works commencing.

5.3 ENVIRONMENTAL PERFORMANCE

Environmental performance criteria for ACT Gas Network is detailed in various sections throughout the Group OEMP.

5.3.1 REGULATORY REPORTING

5.3.1.1 National Greenhouse and Energy Reporting (NGER) Scheme

The NGER Act is a Federal Government regulatory program which enforces mandatory reporting of industry greenhouse gas (GHG) emissions and energy data. Evoenergy gas emissions predominately result from fugitive emissions, leakage of natural gas from pipelines. NGER reporting is carried out by the Evoenergy Environment Team for Icon Water. The data collected is also provided to Jemena for reporting in the SGSPAA NGER submission to the Clean Energy Regulator due to neither Icon Water or Jemena having greater operational control.

5.3.1.2 Safeguard mechanism

The safeguard mechanism is a component of the Commonwealth Department of the Climate Change, Energy, the Environment and Water (DCCEEW) to help industry reduce emissions in line with Australia's climate targets. The Safeguard Mechanism requires Australia's largest greenhouse gas emitters to keep their net emissions below an emissions limit (a baseline). This mechanism applies to facilities emitting over 100,000 tCO2e. As the ACT Gas Network has no facilities over this threshold it is not captured.

5.3.2 ENVIRONMENTAL PERFORMANCE

Corporate environmental objectives and targets have been established in the OEMP. An example of these objectives and targets is detailed in Table 5–1.

Table 5-1: Corporate environmental objectives and targets

Area	Objective	Target
Compliance	To conduct operational activities in compliance with environmental legislation and licence requirements.	Receive no penalties for non-compliance on an annual basis.
Environmental management system	Operational personnel to be involved in the review and improvement of the Environmental Management System.	Maintain ISO 14001 Environmental Management System Certification
Environmental training	Jemena personnel who perform operational activities on gas infrastructure to receive appropriate environmental training.	Operational personnel to receive environmental training periodically.
Environmental performance	Environmental performance indicators relevant to and reflective of operational activities in the natural environment will be developed and reported on.	Monthly reporting of environmental performance indicators with an annual target of 100% performance.
Environmental incidents	To minimise the occurrence and severity of environmental incidents during operational activities.	All environmental incidents to be recorded in OMNIA and investigated appropriately.

In addition to these corporate asset targets, there are environmental performance indexes (**EPI**s) which are tracked monthly. EPIs drive environmental performance improvement at an asset level.

6. RISK

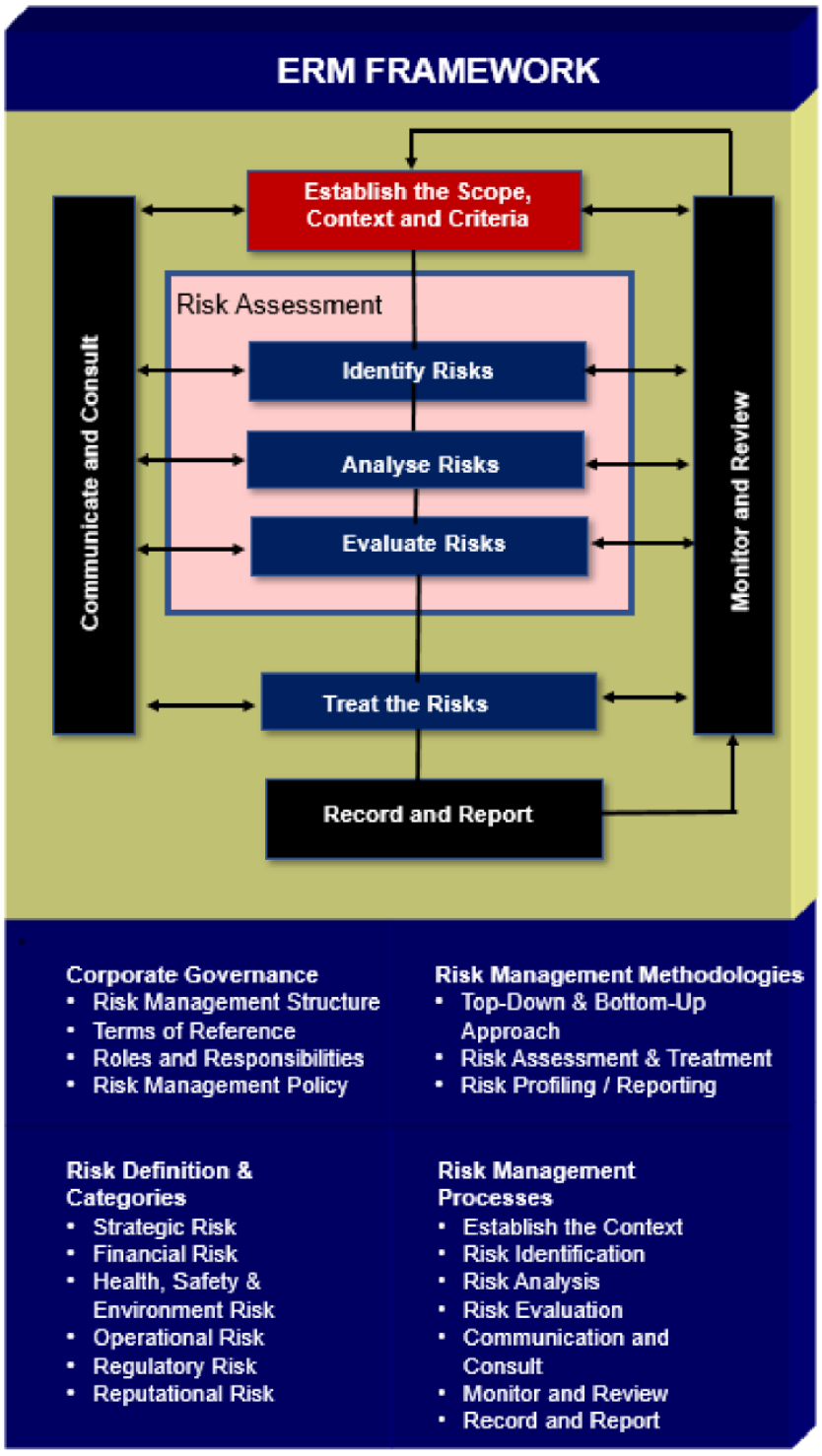
All asset management decisions are linked, in various degrees, to managing risk. For a gas distributor this includes safety risks, avoiding capacity constraints, managing asset failure risk through maintenance and renewals, or managing procurement and delivery to ensure financial prudence.

We recognise risk management is a fundamental driver of effective corporate governance and operational efficiency. We adopt a proactive approach to risk management and build consideration of risk into our day-to-day activities in order to:

- enhance the likelihood of achieving Evoenergy's business objectives, hence improving business performance;
- provide a source of competitive advantage;
- provide a structured basis for strategic planning;
- enhance the effectiveness and efficiency of Evoenergy's operations;
- encourage proactive rather than reactive management;
- improve the quality of decision making throughout Jemena and Evoenergy;
- protect Jemena's and Evoenergy's reputation, value and integrity;
- aid compliance with relevant legal and regulatory requirements and international norms;
- safeguard the network assets, personnel, finance and property (and the assets, personnel and property of the assets managed under contract); and
- safeguard our customers and the community.

To promote effective risk management across the organisation, we have a Risk Management Policy and Risk Management Manual. Both documents are approved by the Risk, Health, Safety and Environment Committee, which is a sub-committee of the Board. Our risk management approach (as outlined in Figure 6-1) is consistent with the risk management standard, AS/NZS ISO 31000.

Figure 6-1: Jemena risk management framework



The key elements of our risk management approach are summarised below.

- **Identify risks** – we identify and document asset risks as part of FSAs required by AS 4645 and AS 2885. Risks are captured in various asset class risk registers, and managed/monitored via the Jemena Compliance and Risk System, **OMNIA**.
- **Analyse risks** – our risk analysis includes considering what risk controls are in place and the consequence and likelihood of risks eventuating. We apply this qualitative risk assessment using the matrices in the Jemena Group Risk Management Manual.
- **Evaluate risk** – where a risk is assessed as extreme or high, we develop action plans to reduce risk to intermediate or lower. Intermediate risk must be assessed to investigate whether there are any reasonably practicable measures available to reduce the likelihood or consequence, thereby reducing the risk to low or negligible. Where no reasonable measures can be identified, a risk may be deemed to be ALARP. A risk ranked as low or negligible is tolerable and there is no requirement to reduce risk further.
- **Treat risks** – where risk action plans require implementation of capital projects, we assess these plans against risk priorities, availability of capital funds, resource availability, deliverability, project management and timing. Our project and program cost estimating processes are designed to ensure options analysis is undertaken, and that the solution with the lowest sustainable cost is selected.
- **Monitor and review** – to ensure risk management and asset lifecycle processes are robust and being adhered to by the business, Jemena has a suite of internal and external reporting and audit processes. This helps evaluate the effectiveness of the overall asset management approach and allows improvements to be identified and implemented.

6.1 MANAGING RISK TO ALARP

We recognise complete elimination of risks is neither practical nor gives the best outcome to the business and customers. However, it remains important for risks to be identified, evaluated and managed to ALARP. The first stage of ALARP assessment is to identify additional or alternative controls that could be applied to further reduce risk. The hierarchy of effectiveness of controls is considered as part of this process. Where additional controls are identified, the feasibility of these options is assessed in terms of practicability and risk reduction benefit.

An intermediate risk may be deemed ALARP when no additional reasonable controls have been identified, or assessment of potential additional controls has deemed them unreasonable (i.e. the cost is grossly disproportionate to the benefit gained).

6.2 RISK REPORTING

We make a conscious effort to integrate risk management into the culture of the organisation. Workshops are conducted on a regular basis to identify and assess risks and determine action plans. For each planned action, the responsibility for implementation is allocated to a member of staff. Progress on these is monitored at six-monthly intervals and more frequently in the case of critical tasks.

We also conduct risk assessments when there are significant changes to processes, equipment or materials. All significant projects undergo a risk assessment phase. Field-based activities completed by contractors are monitored through targeted, risk-based audits.

Risk management reporting includes:

- ad-hoc reports such as those written to serve a specific purpose at a point in time;
- scheduled or automated reports (e.g. monthly or annual reports); and

- graphical reports available on the OMNIA user dashboard, which allows uses to drill down to obtain more detail if required.

Risk reporting is provided to Evoenergy and Risk Management Committee of the Board.

6.3 ASSET RISK REGISTER

We have a OMNIA asset risk register, which is drawn upon from the various asset class risk registers. The register covers risks associated with the gas infrastructure assets which are currently owned by Evoenergy and managed by Jemena.

The asset risk register was developed in line with the Jemena Group Risk Management Manual using the approved consequence materiality and risk likelihood tables. The scope of the asset risk register is limited to risks with the potential to prevent the achievement of Evoenergy's Business Objectives. Risks associated with specific assets are captured in the asset class (and sub-class) risk registers, which are owned and maintained by each relevant Asset Manager.

6.4 RISK PROFILE

All risks included in the asset risk register are monitored in OMNIA. We regularly reassess the current risk profile as work programs are completed and more up-to-date asset data is collected. Risks with a significant, high or extreme severity rating are assessed more frequently than low and moderate risks.

Of the risks included in the OMNIA asset risk register, none are currently rated as extreme. The risk profile based on the current residual risk rating severity is shown in Table 6–1.

Table 6-1: Evoenergy asset risk register risk profile[8]

Residual risk rating	Number of risks
Extreme	0
High	2
Significant	10
Moderate	2
Low	0
Total	**14**

[8] Data obtained from the OMNIA Risk Register report May 2023.

7. LEVELS OF SERVICE

7.1 BUSINESS PERFORMANCE

Business performance measures include customer expectation measures and asset performance measures. Management Services Key Performance Indicators (KPIs) are outlined by the Distribution Asset Management Services (DAMS) agreement. These KPIs are summarised in Customer Expectation and Engagement Section. Asset performance KPIs are outlined in the Asset Performance Section, were the business analyses both annual results and trending against prior year's results. The 'Year to Date' (YTD) performance of these KPIs are also measured and reported monthly.

7.2 CUSTOMER EXPECTATION

The following table summarises the year-to-date results of Management Services KPIs for the ACT Gas Networks for the period 1 July 2023 to 30 June 2024. The following Management Services KPIs are reported monthly according to the DAMS agreement. The following KPIs are a combined ACT and Nowra Gas Network measure, with the exception of Unaccounted for Gas (UAG) which is asset specific.

Table 7-1: KPI Performance Results

Activity	KPI	Measure	RY24		
			Actual	Target	Status
Management	1	Annual Safety & Environmental Management System Audit	●	4	●
	2	Penalised Environmental Breach	●	5	●
	3	Works Authority Notices due to JAM Breach	●	5	●
	4	Emergency Response Preparedness	●	4	●
	5	Reliability of Supply	●	5	●
	6	Annual Safety & Operating Plan Audits	●	3	●
	7	Comply with Technical Codes & Standards	●	5	●
	8	Comply with Acts and Codes and the Access Arrangement	●	5	●
	9	Network Planning & Engineering	●	2	●
	10	Asset Management & Network Planning Services	●	0	●
UAFG ACT	11	ACT/Queanbeyan UAFG Rolling 12 months % (4 months lag)	2.76%	2.49%	●
Back Office/Market Interface	12	**Contract Billing** – Monthly read of the Daily Read Sites (months below 98% target)	100%	98.0%	●
	13	**Tariff Reading** – Quarterly/Monthly/MDL within +/- two working days of the scheduled read date (months below 98% target)	97.6%	98.0%	●
	14	**Service Order Delivery** – within the specified time frame of activity (months below 98% target)	88.84%	94.0%	●
	15	**Billing Data Quality** – % of errors resolved % of errors resolved within five business days (months below 95% target)	99.50%	95%	●

Activity	KPI	Measure	RY24		
			Actual	Target	Status
Field Maintenance	16	**Cathodic Protection** – % of time CP systems are operational	100.0%	95%	●
Capital Management	17	Close out of Major Capital Projects (days)	N/A	90	●
	18	Close out of Minor & Medium Capital Projects (days)	N/A	60	●

(1) KPI 11: UAG increased as a billing reversal was applied for large customers that had persistent meter access issues (construction site).
(2) KPI 14: Service Order Delivery only measured special meter reading. Asset Investments are going to redevelop this KPI to include service orders made from retailers in relation to connections and disconnections.

Table 7-2: Management Services KPIs

Performance metrics	Status
KPI Target Met	●
Corrective Level	●
Actions in Hand – Between Target and Corrective Levels	●

7.3 ASSET PERFORMANCE

Asset performance KPIs cover inherent asset characteristics and focus on supply reliability, asset integrity, and emergency management. The following asset performance measures are as per the year end (June 2024) DAMS Service Performance Report. All asset performance measures were met except UAG which is currently under investigation to review metering and billing performance issues.

Table 7-3: Asset Performance Measures

Measure	RY24			
	Actual ACT	Actual QBN	Target	Status
Major Unplanned Outages > Five Customers (CHOS)	61	37	1,000 [11]	●
CHOS per 1,000 Customers	0.64		N/A	●
Hits to the Network	168	19	240 [12]	●
% Unaccounted for Gas	2.25%		2.49% [13]	●
% Response within 60 minutes	100%	100%	95%	●
Planned Maintenance Completion to Schedule (%)	99.10%	98.90%	95%	●

Measure	RY24			
	Actual ACT	Actual QBN	Target	Status
Pipeline Patrol Compliance (%)	100%	100%	99.95%	

8. CUSTOMER INITIATED PROJECTS

Customer initiated projects comprise:

- Routine and non-routine new customer connections; and
- Unregulated customer-driven works.

Whilst in the past new connection (routine and non-routine) projects have traditionally been a larger proportion of our forecast capital works program compared to unregulated customer-driven work. Currently there is a greater value of external works forecast, and new connections works have declined notably. It should also be noted that the capital costs associated with unregulated works are not added to Evoenergy's regulated asset base, nor funded from regulated revenue.

The volume of new connections is largely outside of our control and can vary significantly from forecast based on market trends, building/dwelling growth and decisions made by individual customers. The largest impact on the number of new connections will be the introduction of the Climate Change and Greenhouse Gas Reduction Amendment Regulation by the ACT Government. This Regulation effectively phases out new gas connection with connections ceasing in 2029 within the ACT. It is also expected that there will be a reduction in the percentage of new homes connecting in NSW as individuals and builders take up electrification as an option. Government Policy will also have an impact with the updated Nation Construction Code and BASIX being less favourable to gas than previous versions.

For the period of this AMP it covers the Evoenergy Access Arrangement 2026-2031, Evoenergy has engaged The Centre of International Economics (CIE) to forecast the number of new connections.

Connections capex is driven by two market types:

- Volume market (annual consumption <10 TJ/pa); and
- Demand market (annual consumption >10 TJ/pa).

The volume market comprises of the following customer types:

- Residential electricity-to-gas (E2G) – customers currently not using gas, generally converting from electricity and/or LPG appliances;
- Residential new homes – customers connected in new home developments and knock-down rebuilds in established areas;
- Residential medium density – customers in medium density villa-type housing or small high-rise developments (generally up to three floors in height);
- Residential high-rise apartments – customers in high density developments (generally over 3 floors in height with centralised facilities). These sites may have a single meter for the entire site VBM or individual meters VI and in some cases may be a combination of both solutions; and
- Industrial and commercial volume market – small-scale commercial and industrial customers.

The demand market is made up of major industrial and commercial customers that individually consume more than 10 TJ of gas per annum.

8.1 UNREGULATED CUSTOMER INITIATED RELOCATION WORKS

Unregulated customer-initiated relocation work involves relocation of Evoenergy assets mainly due to road upgrades and expansion of the transport infrastructure. These projects are externally funded and directly managed by Jemena.

These projects are outside the Services Plan. However, communications to Evoenergy of these projects are undertaken via a number of avenues including the monthly capital meetings and reports.

8.2 FORECASTING METHODOLOGY

The Connection Capex forecast is based on projecting connection asset volumes for future years and current unit rates. The forecast capex is primarily based on:

1. Forecast number of connections for the relevant connection type, to determine the quantity of mains, services and meters that will be required to connect the new customers; and
2. The historical average unit rate for mains laid, service pipes laid, and meters forecast to be installed for the relevant connection type.

8.2.1 FORECAST UNIT RATES FOR VOLUME MARKET

The forecast unit rates used are 'blended' rates based on the latest four years historical average, which are effectively weighted average unit rates that account for the mix of unit types.

8.2.2 NEW CONNECTION VOLUMES

The forecast numbers of new connections are forecasted by The Centre for International Economics (CIE) engaged by Evoenergy for their Access Arrangement period 2026-2031. It is noted that there is no new connections forecasted in the ACT jurisdiction but only in the NSW jurisdiction of the gas network (ie. Queanbeyan and Palerang).

The connection forecasts are shown below.

Table 8-1: Forecast Number of New Customer Connections[9]

	RY26	RY27	RY28	RY29	RY30	RY31	RY32
Electricity to Gas	0	0	0	0	0	0	0
New Estates	266	257	245	250	250	247	244
Medium Density/High Rise	25	24	23	24	24	23	23
Industrial & Commercial Tariff	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Industrial & Commercial Contract	0	0	0	0	0	0	0
Total Connection Numbers	**301**	**290**	**278**	**283**	**283**	**280**	**276**

[9] CIE March version.

Ratios of forecast activity volumes are based on the latest four years historical averages derived from historical data for mains, services and meters installed for each connection type. These ratios are used to forecast the volumes of metres of mains, number of services, number of meters and associated equipment required to be installed for the forecast connection numbers. The forecast volumes for mains, services, meters and associated equipment to be installed are shown below.

Table 8-2: Forecast of mains, services and meters to be installed for new connections

	RY26	RY27	RY28	RY29	RY30	RY31	RY32
Distribution mains (metres)	5,087	4,912	4,704	4,781	4,781	4,726	4,671
Inlet service pipes (number)	287	277	265	269	269	266	263
Meters (number)	298	288	276	280	280	277	274

9. CAPACITY AUGMENTATION

9.1 OVERVIEW

Capacity augmentation projects are identified as part of the annual capacity planning cycle and are directly impacted by changes in forecast demand. Augmentation projects typically involve installing additional or higher capacity mains, and/or new regulator sets. As part of the current Services Plan there are no augmentation activities in the Plan's forecast period.

The network is designed to ensure gas is available to customers during peak times – typically on cold winter days. Each year, the utilisation of winter peak gas demand for the network is assessed. This is done by comparing annual pressure gauges and telemetry information alongside network model validations. Peak gas demand forecasts are developed based on the number of new connections and historical growth, and these forecasts are added to the network model to predict where and when a potential loss of gas supply is likely to occur.

When a section of the network is identified as being at risk of loss of supply, we look at network augmentation options to eliminate that risk. These options are then analysed as part of our investment governance process, and business case for the augmentation project will commence.

9.2 AUGMENTATION PLANNING METHODOLOGY

When developing augmentation projects, we consider the following factors:

- **Network configuration and condition** – the network configuration, its topology, geography, location and physical state are critical considerations. For example, crossing a river, railway line or major highway can prove to be difficult and costly, so alternative routes would be assessed to minimise these types of crossings.
- **Cost effectiveness of potential options** – to promote efficient investment, the capacity assessment process requires development of several options that balance the benefit to customers with the cost of implementation.
- **Timing** – as a general principle, we implement augmentation projects as late as possible. This extends the life of existing assets where prudent and safe to do so, but not so late as to create an unacceptable risk of loss of supply. We balance the expected timing of loss of pressure with the time to implement the option. We do this by running network optimisation software and simulations to model peak network flows. Simulations are updated for the most recent demand and growth forecasts. The year in which gas pressures are simulated to decline significantly below the minimum pressures is typically chosen as the year by which the project must be completed.

9.3 CAPACITY PLANNING CRITERIA

Network augmentation has historically been driven by increases in peak demand that are forecast to reduce network pressures below critical thresholds. In most cases, increases in peak demand occur incrementally as customer numbers increase in parts of the network. The ACT government legislation has stopped new gas connections in the ACT, and is working towards decommission of the network by 2045. These changes has limited connections and growth of the network to areas within NSW.

We are still monitoring network performance each winter to ensure the current customer base has sufficient security of gas supply and no unknown integrity issues across the network have occurred.

9.4 CAPACITY AUGMENTATION PROJECTS

Capacity Augmentation projects are generally grouped into three categories:

- **Existing customer demand growth (organic growth)** – augmentation projects are required as a result of peak demand rising in established areas, typically due to customers installing higher capacity appliances or household behavioural changes. This is still being monitored.
- **Medium density and high-rise developments** – augmentation projects are required to connect new (typically residential) developments, where there is a concentrated gas load with a single service connection. If several medium density/high rise buildings are being developed in one area, we consider the capacity requirements of subsequent/concurrent projects and plan accordingly. Medium density/high rise residential developments may have commercial tenants at ground level, which adds to peak demand. There is still a small presence in Canberra with this category.
- **New estate growth areas** – as discussed earlier, following the ACT Government's decision to remove the requirement of gas for all new estates and the pending legislative changes, Evoenergy is no longer laying gas mains in new estates within the ACT.

9.5 EXTERNAL FACTORS

The key external factors that affect Capacity Augmentation include:

- **ACT Government policies** – the introduction of the legislative targets to achieve zero net emissions by 2045 via the ACT Governments Climate Change Strategy, and the removal of the mandatory requirement that gas mains infrastructure is rolled out in new estates has reduced the expenditure forecast in this category with the amount remaining focused on supporting the medium density and high rise developments. Gas demand has significantly slowed across the whole network as the changes are implemented and the impact on our consumers and their gas appetites are realised.
- **ACT Planning authority** – the Territory Plan provides a policy framework where gas mains may be installed (as a function of the zoning of areas through which they are laid) meaning specific routes cannot be established until planning subdivisions are complete. Changes to the Territory Plan have removed the mandatory gas requirement, as per the policies above, meaning developers have the option to install full-electric new suburbs.
- **Market Development** – changes in usage patterns occur such as:
  - Conversion of a large residential block to townhouses or high rise development;
  - Installation of higher efficiency appliances; and
  - Household behavioural changes.
- **Weather** – seasonal severity of winter weather patterns are predicted based on historical trends and experience, hence a winter severity factor is applied to account for a '1 in 20 year' scenario.
- **Technical Regulator** – expectations and the governing framework of the Utilities Technical Regulator (UTR) must be met.
- **Australian Energy Regulator (AER)** – prudent expenditure in this category is determined by the AER via the Access Arrangement submission.

10. NETWORK ASSET REPLACEMENT

This section provides a high level overview of asset management activities and key asset replacement/rehabilitation projects expected to be required during the forecast period.

Our overall approach for asset replacement is informed by the individual asset class strategies prepared for each of the network asset classes. Our gas network asset classes[10] are:

- Distribution network;
- Pipelines;
- Gas facilities; and
- Measurement (metering).

Our asset class strategies are intended to cover a minimum period of 20 years and seek to ensure reliable performance and prudent risk management. The asset class strategies help ensure an appropriate balance of Capex and Opex through the consideration of total lifecycle management costs. Our aim is to ensure assets are managed optimally to the benefit of our customers.

When developing asset class strategies, we consider the following information:

- asset class profile, which includes information about the type, specifications, life expectancy and age profile;
- asset class objectives, which define what we want to achieve with each class of asset;
- asset risk, which includes identifying threats, opportunities, strengths and weakness. This includes asset performance objectives and measures, criticality and condition. Risks and opportunities are then documented and compared against asset objectives to develop a ranking/prioritisation;
- asset performance, which includes information about current performance against asset indicators, objectives, drivers, and service levels;
- scenario analysis, which considers variables such as time, capital and maintenance costs to confirm risk tolerance and opportunities for efficiency improvements or investment deferral;
- capacity analysis which includes information gathering on the performance and reliability of the network;
- asset expenditure assessments, which include information about historical and forecast operating and capital requirements and the impact on prices to gas consumers.

10.1 KEY ISSUES

The overall condition of the network assets is generally good. Other than specific pockets of the network where assets are nearing the end of their technical life, or require replacement in order to reduce risk (or manage it to ALARP), the overall risk associated with the gas network is within tolerable levels.

[10] Non-network assets are discussed in chapter 12 of this AMP.

Subject to the current controls being maintained, plus execution of the expenditure proposed for the forthcoming Services Plan period, we expect the gas network to remain safe and to continue to provide a reliable gas supply to customers.

The primary types of risk that impact Evoenergy network assets are:

- asset failure (e.g. corrosion);
- operational risks (e.g. human error);
- third party hits and urban encroachment of high pressure pipelines;
- failure or reduction in control effectiveness (e.g. inadequate signage or shallow cover);
- regulatory or compliance risks (e.g. change in mandatory compliance/standards); and
- asset lifecycle risks (obsolescence of equipment).

Key network asset replacement programs required in the next seven years to help mitigate these risks include:

- **Inlet Piping Rectification - Tuggeranong (Hyperdome)** – This project is needed to ensure all shopping centres in the ACT Gas network region that are fitted with a ring main that complies with relevant safety and compliance requirements.
- **Canberra Primary Mains Mechanical Protection** - This project has been initiated as result of ALARP assessment of CPM against pipeline rupture. As per the assessment, the entire CPM is found to be at low risk of rupture due to the existing concrete slabs along the entire gas main, however the ALARP review identified a 2km section of CPM to have rock jacket coating which does not provide the same level of protection as the concrete slab, therefore it's planned to investigate the extent of the rock jacket coating and install HDPE plates over the impacted section of the CPM.
- **Paddock Marker RY26 –** This project is a continuation of previous annual program focused on maintaining the visibility and accuracy of marker signs along the Evo pipelines. The primary objective is to replace faded, outdated, or damaged marker signs along sections of the Canberra Primary Mains. This includes updating incorrect contact numbers and ensuring all markers display up to date and legible information.
- **Installing Induced AC Mitigation – ACT** - The scope is to install zinc rods with Solid State Decoupler (SSD) at the identified test points. This project will restore effective cathodic protection, mitigate the induced AC voltage, and protect the pipeline from corrosion, ensuring its continued safe and reliable operation. This project is an important part of Jemena's ongoing commitment to maintaining the integrity and reliability of its gas distribution network. It supports long-term asset sustainability, environmental safety, and regulatory compliance, ensuring the continued safe operation of the Jemena-managed gas infrastructure.
- **Minor Capital Works (HP Facilities)** – This program is for projects within the high-pressure gas facilities that are low complexity for which no process of individual identification or assessment is made in advance for reasons of efficiency and practicality. These projects are often identified during the year and also typically for projects required to meet current service and supply standards. Projects may include replacement of minor .components, work safety and security items within and around the facility.
- **Facilities E&I Compliance Upgrades** – These projects are required to address various non-compliance issues adhering to multiple electrical Australian Standards, Regulations and Acts, about electrical equipment in hazardous areas and electrical earthing. The sites requiring upgrade are Phillip PRS, Watson TRS and Bungendore POTS.

- **DRS - Replace and Install - Brookes St Mitchell, DR 48 -** Replace DR48 in Brookes St Mitchell with new Y20 SRS. Lay 40m x 100 mm steel main extension to feed new district regulator. The existing district regulator is in very poor condition due to rust issue
- **Security upgrade for Fyshwick, Watson and Phillips PRS –** This Additional Service Request (ASR) seeks approval for $250K to upgrade security at three facilities in ACT: Watson TRS, Fyshwick TRS, and Phillip PRS. The upgrades will address security risks identified in the 2023 assessments and meet the Group Security Specifications Standard as well as comply with the Security of Critical Infrastructure Act 2018, 2021, and 2022. The project, managed by the Business Resilience Team, ensures continued gas supply to approximately 120,000 customers by remedying deficiencies in access control, alarms, and monitoring systems, and it aligns with the National Gas Rules and Regulatory Asset Base requirements.
- **Meter Replacement** – Replacing almost 33,000 residential and I&C gas and water meters.
- **GIS Migration** – The GIS and BYDA service was migrated from Evoenergy to JGN in 2024, there will be ongoing activity to further align and improve geospatial capability.

The above list represents the current planned program of works. However, the asset replacement requirements are continually reviewed and will likely change over the course of program delivery. Our works program also includes ongoing maintenance, provision for reactive asset replacement, and other minor works not included in the list above.

10.2 DISTRIBUTION NETWORK

The distribution network asset sub-classes are:

- secondary network (mains and services operating at 1,050kPa);
- medium and low pressure mains and services;
- network pressure control (district regulator stations); and
- consumer pressure control (boundary regulators).

Asset management strategies for each of these sub-classes are summarised below. For more detail, refer to the Networks Asset Class Strategy.

10.2.1 SECONDARY NETWORK

Evoenergy's secondary mains asset category consists of 234km of steel pipe, which is externally coated with High-Density Polyethylene (HDPE) to protect it from corrosion and internally lined to reduce frictional losses and provide some internal corrosion protection. The secondary mains have an MAOP of 1,050kPa.

The secondary mains asset category also consists of secondary services, line valves and cathodic protection (CP) systems.

10.2.1.1 Performance and requirements

Integrity of the secondary mains is assessed through integrity and performance assessments which use indirect monitoring and performance methods including leakage survey, publicly reported leaks, field reports and feedback, pipeline patrol and review of data from Cathodic Protection (**CP**) surveys and circuit checks.

Projects are identified through the network capacity validation and planning process, to augment the capacity of the secondary mains to provide supply reliability for organic growth. The level of expansion activity on the secondary mains is dependent on location and volumes of load growth over the medium to long term.

New estate development areas are generally located along the fringes of established areas. The secondary network is expanded into these new estates as land is released. Currently expansion activity is concentrated in the growth areas near Gungahlin and Molonglo. However, with the ACT Government's removal of mandatory gas mains in new suburbs and the legislative targets on achieving net zero emissions by 2045, it is forecast that these areas growth will be arrested and new suburbs start becoming fully electric. However growth is still steady in Queanbeyan across new homes and medium density, as it is not impacted by the proposed ACT legislation.

Secondary mains are operated and maintained in accordance with the Safety and Operating Plan and the requirements of AS/NZS 4645. This includes providing CP to the network and maintaining it, CP surveys, leakage surveys and conducting Formal Safety Assessments (FSA). An FSA was conducted in 2021. The FSA demonstrated that the Secondary network asset class is generally operating safely.

10.2.2 MEDIUM PRESSURE MAINS AND SERVICES

The medium and low pressure mains and services supply natural gas to domestic and Industrial & Commercial customers. The network comprises of mains, services, valves, and exposed mains.

The mains and services are predominantly plastic (polyethylene and nylon). The medium and low pressure mains make up the majority of the Evoenergy ACT network length with 4,489km of mains.

Valves are devices used to stop the flow of natural gas. This includes both standard sector isolation valves, bushfire valves and high-risk sector valves.

Exposed mains are those mains that are not directly buried in the ground. Typically, exposed mains are located in or under bridges, culverts and across storm water channels, etc.

10.2.2.1 Performance and requirements

Jemena assesses and confirms the condition of the mains in accordance with Australian Standard AS/NZS 4645. The network is generally in good condition and this assessment is supported by numerous integrity assessments, including:

- Network leakage tests;
- Leakage survey;
- Incident Cause Analysis Method (ICAM) – Network incidents assessments;
- Formal Safety Assessments (FSAs);
- Field failure report; and
- Poor supply report reviews.

Leakage surveys are a maintenance strategy employed to locate leaks in gas distribution networks. The frequency with which surveys are undertaken is based upon risk and past performance, with all sections being surveyed at least once every five years (the minimum requirements of AS/NZS 4645). More frequent surveys are undertaken in high-risk areas and where previous surveys indicated an excessive level of leaks. All gas leaks located are assessed. Jemena will be moving from the traditional foot surveying to vehicle mounted using Picarro technology to identify leaks and be able to measure emissions.

Network incidents are another indicator of network integrity and performance. An incident can be caused by a component failure. Failed components (pipe and fittings) are sent to a laboratory for analysis. A common cause of failure is poor joint quality, an issue that occurred during network construction. Significant work has been undertaken to improve construction quality for polyethylene mains.

The Medium Pressure network is operated and maintained in accordance with the Safety and Operating Plan and the requirements of AS/NZS 4645 and includes conducting Formal Safety Assessments (FSA). An FSA was conducted in 2023. The FSA demonstrated that the Medium pressure network asset class is generally operating safely.

10.2.3 NETWORK PRESSURE CONTROL

A Secondary District Regulator Set (SDRS) is the generic term used to describe Regulators Sets that supply the medium pressure networks. The SDRS' reduce the pressure from the secondary network to supply the medium pressure networks and most are located on public land and are installed in underground pits. There are currently 96 SDRS' in the Evoenergy ACT gas network.

10.2.3.1 Performance and requirements

The SDRS' have high reliability with respect to their primary function of delivering gas to the distribution network and the performance is reasonable.

In the past, SDRS integrity issues have existed and are reviewed to determine if further action is necessary. Flaws in the design of the existing boxes result in numerous issues such as water ingress, maintainability issues, traffic hazards, ergonomics issues, etc. Mitigations included fitting of vent pipes, drainage, removal of corrosion and painting.

The vendor has given notice that the production of Cocon regulators (13 and 26) will cease immediately, with the support of soft components to continue for 10 years. There is one Cocon installed in the ACT and the strategy for ongoing management or replacement of this will need to be determined.

Expenditure on SDRS' is driven by demand growth (Market Expansion or Capacity Development). However, due to the ACT Governments net zero emissions targets, there are no new SDRS forecast to be installed for the next 10 years. SDRS' that are retired from service are inspected for serviceable components. The components are then reconditioned and re-stocked for future use to support the legacy population of SDRS' and any unserviceable SDRS' are scrapped.

SDRS' are operated and maintained in accordance with the Safety and Operating Plan, Technical Policies and AS4645 (Gas Distribution Network Management). A FSA was conducted for SDRS in 2023. The FSA demonstrated that the SDRS asset class is generally operating safely. The FSA identified opportunities for conducting maintenance activities in a safe manner but also identified two SDRS', located in unsuitable locations. A further assessment has determined that traffic control will be employed when maintaining these one sites, and the other is being relocated due to 3rd party works.

The Capital Plan provides the entire program detail for this asset class. The material projects will be identified through market expansion projects as they arise or when an existing regulator is expected to not be adequate for the capacity requirements.

10.2.4 BOUNDARY REGULATORS

Boundary regulators are used to reduce the secondary or medium pressure at the property boundary to low pressure. The low-pressure end-user service then supplies medium or high-density housing, such as units, townhouses or villa complexes, shopping centres and some I&C customers.

Boundary regulators are installed to:

- reduce gas pressure to a safe level before delivery into the customer's premises. Lowering the pressure reduces the consequences from the threat of a gas escape;
- protect the customers' (building) piping services from the threat of over pressurisation that can cause a gas leak within a building;
- protect the customer's appliances from the threat of over pressurisation that causes poor combustion and "lift off" of the flame; and
- avoid the need for over pressurisation management on internal meter sets. This eliminates the need for vent lines.

10.2.4.1 Performance and requirements

Overall, the consumer pressure control asset class is in good condition. All boundary regulators installed after 2000 have over pressure shut off (OPSO) valves, which will operate if the regulator fails. However, some older boundary regulators in the network only have a relief valve, which poses a safety risk.

We are monitoring the risk associated with these older regulators via annual service checks, and are undertaking a boundary regulator replacement program, targeting regulators without OPSOs.

10.3 PIPELINES

10.3.1 TRUNKS

The ACT Gas Network trunk pipeline system comprises of the Hoskinstown-Fyshwick Pipeline, CP systems, and pig launcher and receiver.

The Hoskinstown-Fyshwick Pipeline falls under two jurisdictions:

- **Hoskinstown to NSW-ACT Border.** This 22km section is in NSW has been granted Licence No. 29 under the NSW Pipelines Act 1967 and is connected to the Eastern Gas Pipeline (EGP) at the Hoskinstown Custody Transfer Station (CTS); and
- **NSW-ACT Border to Fyshwick**. This 8km section is in the ACT and continues from the border to the Fyshwick Trunk Receiving Station (TRS) at Fyshwick. There is no licensing regime in the ACT and this section is administered under the Utilities Services Licence.

The Hoskinstown-Fyshwick Pipeline was commissioned in June 2001. It was designed, constructed, tested, and operated in accordance with the requirements of AS 2885. The MAOP of the pipeline is 14,895kPa.

The pipeline is 30km long and has a nominal diameter of 250mm. The pipeline is constructed of high strength steel and is externally protected against corrosion by an anti-corrosion pipe coating and has internal lining for flow efficiency. Additional external protection is also achieved with a CP system.

10.3.1.1 Performance and requirements

The trunk pipeline integrity is maintained for the MAOP and is considered fit for purpose. The pipeline conditions are assessed and confirmed based on:

- Jemena Safety and Operating Plan (SaOP);

- Australian AS 2885 standards; and
- Jemena Asset Management System (AMS)[11].

Jemena's Asset Management System (AMS) enables a systematic management approach to support our pipeline assets by integrating various disciplines such as safety, engineering, risk, finance, and economics. It ensures the necessary balance between performance cost and risk. The AMS processes, Asset Class Strategy (ACS) and Field Operational and Maintenance (FOMS) outlines key assessment methodologies for maintaining pipeline integrity. Integrity validation is based on pipe conditions derived from data obtained through inspection and testing which includes:

- Inline inspection (ILI), also referred to as 'Pigging', assesses metal loss and mechanical damage;
- Cathodic Protection (CP), coupled with diligent monitoring significantly enhances the overall corrosion protection of pipelines, particularly in areas where coating damage has occurred;
- Direct Current Voltage Gradient (DCVG) measurement provides indication of coating defects which may lead to potential corrosion;
- Integrity Digs provide direct measured pipe data at selected locations based on indirect measured integrity data; and
- Safety Management Studies (SMS) enables pipeline safety and risk assessments which identify threats, review controls and implement additional protection measures where existing controls are inadequate. The SMS considers all relevant data obtained from the inspection and testing to determine the pipeline integrity for the pipeline MAOP.

The most recent SMS for the trunk pipelines was conducted in 2021 and identified:

- No unauthorised landowner activities near the trunk pipelines;
- No significant metal loss from corrosion was reported via the most recent ILI data (2021);
- No substantial changes to the Location Classification within the past five years;
- No observable or reported incidents that impacts the safe operation of the pipeline at MAOP;
- No other events have occurred that have affected the pipeline integrity; and
- All control measures, procedural and physical, were implemented and remain effective

There have been no failures or repairs on the Hoskinstown to Fyshwick pipeline. There are no reported incidents, either operational or external, that have affected the integrity of the trunk pipeline. The next SMS is planned for 2026.

The Maintenance Plan for trunks includes routine and planned activities; and non-routine plus ad-hoc activities. Non-routine maintenance activities are initiated from actions required by the integrity review or arising from pipeline risk management of external activities and/or encroachment

The following special maintenance projects have been included in the Maintenance Plan:

[11] Jemena Asset Management System (AMS) and its processes are implemented to meet the requirements of AS2885.3 Pipeline Integrity Management Plan (PIMP)

- Coating defect surveys are completed every ten years with the last survey undertaken in RY15, so the next survey is expected to be completed in RY25; and
- Exposed mains inspection to enable a physical close-up inspection to support integrity management.

There are currently no plans to construct any new trunk pipelines or augment the existing trunk pipeline. The key capital works for the trunk pipeline are related to the integrity management of the pipeline.

10.3.2 PRIMARY MAINS

The Canberra Primary Main consists of 37 km[12] of high-strength steel pipe with a MAOP of 6,895kPa. The pipes are externally protected against corrosion by an anti-corrosion pipe coating and internal lining for flow efficiency. The implementation of a Cathodic Protection (CP) system effectively provides an additional layer of corrosion protection. The Primary Mains were predominantly constructed in the mid-1990s and early 2000s with the new Hume Primary Main Extension being completed in 2015.

10.3.2.1 Performance and requirements

The primary mains' integrity is assessed from the data produced from the following activities which are assessed by the SMS in the five-yearly integrity review:

- Pipe Wall Condition: Inspection/testing using Pipeline pigging and/or integrity digs;
- Corrosion Protection: CP monitoring (planned activity) and DCVG;
- Operation Controls: pressure, temperature and gas quality monitoring; and
- Maintenance Activities: planned work to the approved procedures and work methods.

The data from these activities is compiled and reviewed during a five-yearly SMS which also assesses pipeline risk (safety, environmental and supply continuity), identifies threats, reviews controls and recommends additional protection measures where existing mitigations are inadequate. The SMS considers all relevant data obtained from inspection and testing activities to determine the pipeline integrity for purposes of confirming (or validating) the pipeline MAOP.

The primary mains are managed to ensure continued performance in accordance with their design and operating requirements. There have been no failures of the primary mains.

To mitigate the risk of failure, the performance of mains pipelines is managed through a condition monitoring and inspection program to identify potential issues before they lead to a degradation of performance.

Pipeline operation complies with AS 2885 to ensure "continued pipeline integrity during the life of the pipeline". Pipeline integrity is assessed and maintained through an integrated and systematic program of pigging (where applicable), periodic SMS reviews (five-yearly and when changes are made to operating conditions) and integrity digs (based on operating and maintenance data).

The most recent SMS for the primary mains was conducted in 2021 and identified:

- No unauthorised encroachment activities have been reported near the CPM primary mains, however, unreported child care centres development occurred within the measurement length of CPM in the Throsby area. This resulted in installing additional marker posts along the pipeline alignment.

[12] The stated 37km of primary mains excludes approximately 6km of the CPM section between Gungahlin and Belconnen which, although designed for 6,895 kPa has been operating and maintained at secondary pressure of 1,050 kPa since installation due to no capacity demand.

- No substantial changes to the Location Classification within the past five years; however, urban development has increased around the primary mains and a number of sensitive developments were identified (child care centres) within close proximity of the pipeline. These areas have their location classes been upgraded from residential (T1) to either high density (T2) or T1-S (residential with sensitive development);
- No significant metal loss was detected in the 2015 ILI inspection, however, a couple of construction weld defects were identified and repaired during the integrity digs in 2017 in conjunction with the works related to the Majura Parkway upgrade.
- No observable or reported incidents that impacts the safe operation of the pipeline at MAOP;
- No other events have occurred that have affected the pipeline integrity; and
- All control measures, procedural and physical, were implemented and remain effective.

There are no reported incidents, either operational or external, that have affected the integrity of the primary mains. The next SMS is planned for 2026.

Inspections and integrity digs are inputs to maintain the integrity of the primary mains. These include:

- ILI, where applicable, and validation digs, which are used to assess the pipe wall conditions and identifies dents, gouges and corrosion;
- Validation digs provide supplement information of the pipeline condition between two successive ILI's to monitor and validate integrity. The nominal ILI interval for a well-managed pipeline is 10 years. Next ILI for CPM is planned for RY25.
- Integrity digs are also carried out to manage pipeline integrity as a result of encroachment activities such as major road upgrades. There are few integrity digs planned due to upgrade works planned at Monaro Highway which may result in additional pipeline protection.
- Are currently no plans to construct any new primary main or augment the existing primary network. The key capital works for the primary main are related to the integrity management of the pipeline.
- Canberra Primary Mains – mechanical protection: This project is a replacement project to Watson PLS station, and is aimed at addressing the 2km section of the CPM identified in an ALARP assessment as having rock jacket coating instead of concrete slabs, reducing mechanical protection. The scope includes confirming the extent of the rock jacket coating and installing HDPE plates to reduce rupture consequence.

10.4 FACILITIES

The ACT Gas Network consists of a number of Trunk and Primary Facilities as described below.

Table 10-1: Trunk and Primary Facilities Description

Facility	Pipeline	Quantity	Description
Trunk Receiving Station (TRS) *Fyshwick TRS* *Watson TRS*	Trunk	2	Gas pressure reduction and filtration facilities that are supplied at trunk pressure and deliver gas at appropriate pressure to downstream network.

Facility	Pipeline	Quantity	Description
Packaged Off-Take Station (POTS) *Bungendore POTS*	Trunk	1	Smaller capacity gas pressure reduction and filtration facilities that are supplied at trunk pressure and deliver gas at the appropriate pressure to the downstream network.
Custody Transfer Station (CTS) *Hoskinstown CTS* *Watson CTS*	Trunk	2	Installations equipped with metering facilities to accurately measure gas transfer through the CTS. These meters are used for billing purposes and are calibrated in accordance with appropriate measurement standards.
Water Bath Heaters (WBH) Located at: *Hoskinstown CTS*	Trunk	1	Water Bath Heaters are used to preheat gas to ensure that the temperature reduction (Joule Thompson Effect) caused by large pressure drops through regulators does not adversely affect the facility and downstream pipeline.
Catalytic Heaters (CH) Located at: *Bungendore POTS*	Trunk	1	Catalytic Heaters are used to preheat gas to ensure that the temperature reduction (Joule Thompson Effect) caused by large pressure drops through regulators does not adversely affect the facility and downstream pipeline. This is a new installation.
Boilers and Heat Exchangers Located at: *Fyshwick TRS*	Trunk	2	Heat exchangers are used to preheat gas to ensure that the temperature reduction (Joule Thompson Effect) caused by large pressure drops through regulators does not adversely affect the facility and downstream pipeline.
Primary Regulating Stations (PRS) *Hume PRS* *Phillip PRS* *Gungahlin PRS*	Primary	3	Gas pressure reduction and filtration facilities located at each off-take on the primary main. These facilities reduce the pressure from 6,000kPa to 1,050kPa to supply the secondary network or lower metering pressures to specific customer.

The age profile and key statistics of these facilities is depicted below.

Note that individual components of the stations such as filters and regulators are replaced at various times during the life of the facility which are not reflected in the figure below, however an allowance has been included in the Capital Plan for such items.

Table 10-2: Trunk and Primary Facilities Age Profile

Facility	Year Commissioned/ Last Upgraded	Age
Fyshwick TRS	2013	12
Bungendore POTS	2007	18
Hoskinstown CTS	2007	18
Hume PRS	2015	10
Philip PRS	1999	26
Gungahlin PRS	2006	19
Watson TRS	1995	30

10.4.1 STRATEGY

The asset strategy for trunk and primary facilities over the AMP period is to ensure the safety, functionality and compliance of assets, which meet regulatory requirements, and cater for growth of the network.

Amongst other things, the Asset Class Strategy document describes in detail the integrity of the facilities and encompasses the whole of life cycle of the assets from creation to disposal.

The Asset Class Strategy also:

- Provides an integrated and structured plan for design, construction, commissioning, operation and maintenance of the facilities;
- Incorporates the requirements of AS4041 and AS2885 suite of Standards, which provides the assurance of the integrity of the facilities; and
- Outline the key processes, assessment methodologies, and recommendations of activities/practises for managing the integrity of the facilities.

The following activities are currently undertaken to assess, validate and manage the asset integrity:

- Planned Maintenance Inspections and audits, which include corrosion monitoring and visual inspections; and
- Field Failure and Incident Reports are reviewed to determine the level of significance in order to assign the appropriate level of assessment or investigation.

The output of the activities is analysed with the following results:

- The condition of the stations (TRS/POTS/CTS/PRS) and equipment (WBH/Catalytic and Heat Exchangers) vary across the network. Overall structural integrity is satisfactory for containment and reliability of supply;
- Requirement to upgrade non-conforming E&I components to ensure safety and meet regulatory requirements; and
- Corrosion of piping within trunk and primary facilities resulting in loss of containment is emerging as a key integrity issue. The action arising is to introduce additional maintenance projects to expose and inspect pipe under thermal lagging and pipe coating.

10.4.2 PERFORMANCE

The assets are performing in line with expectations. Plans are in place for regular and noted issues.

10.4.3 RISKS AND ISSUES

The consequence of High Pressure Facilities failure can be catastrophic including fatalities, loss of assets and long term interruption to supply. The most significant performance issues are with electrical and instrumentation compliance.

Jemena is undertaking a facilities Electrical and instrumentation (E&I) compliance upgrade program across the Evoenergy high pressure (HP) gas stations. E&I equipment within these gas stations need to comply with the requirements of the Electricity Safety Act 1971 and the Electricity Regulation 2004. Each facility

consists of the following E&I equipment that enables the facility to safely and reliably supply gas to its customers:

- Transmitters, switches, control valves, controllers, cables etc; and
- Electrical motors, lights, electrical switchboards, batteries, etc.

Risks have been identified via inspections, testing and maintenance activities and logged into the Asset Risk Register. These risks may lead to a loss of supply as well as personnel and public injuries leading to reputational and legislative implications. Many risks are being managed through short term mitigation but as the assets age, replacement of the non-conforming equipment will enable a compliance baseline to better manage the asset.

The facilities E&I compliance program includes the following high pressure sites:

- Bungendore POTS;
- Phillip PRS; and
- Watson TRS.

10.4.4 ACTIVITIES

The most significant projects to facilities that are expected to be carried out over the AMP period are:

- The E&I Compliance Upgrade works to replace non-conforming electrical equipment as mentioned above (ACT High Pressure Facilities E&I Compliance Upgrades);

Operational step changes are included for the cyclical inspections of Water Bath Heater, Boilers and Heat Exchanges and new or upgraded assets coming on line. These cyclical inspections and new or upgrade assets are included 'Variations to the Asset Services Fee' reflecting their cyclical nature.

10.5 MEASUREMENT

The measurement asset sub-classes are:

- Gas measurement equipment;
- Water measurement equipment;
- Data collection equipment; and
- Gas quality measurement equipment.

Metering errors and timing difference constitutes the majority of UAG contribution for the Evoenergy network. The accuracy and reliable performance of the measurement equipment is critical to ensuring UAG is minimised.

10.5.1 GAS MEASUREMENT EQUIPMENT

Gas measurement equipment includes:

- **Diaphragm meters** – diaphragm meters are installed for standard domestic and commercial and industrial customers. There are about 144,000 meters in the ACT gas network.

- **Rotary and turbine meters** – these meters are installed on high demand gas customers. There are about 380 turbine and rotary meters.
- **Regulators** – regulators provide pressure control at the point of gas delivery from the network to the customer, ensuring safety of the downstream customer installation and correct billing. They are installed in contract customers, single dwellings, medium density and high-rise developments.

10.5.1.1 Performance and requirements

Gas meters are operated and maintained in accordance with Jemena Policy – Metering Equipment Maintenance, Service and Disposal, technical regulatory requirements and Jemena's Integrity Management Plans. As most meters are mechanical, the internal components of meters wear over time and become inaccurate or simply stop working. We replace these meters to ensure measurement accuracy, reliability and safety.

Rotary and turbine meters are replaced after 15 and 7 years depending on whether the average annual gas consumption is less than the maximum capacity of the meter. These meters are typically refurbished when it is technically and economically efficient to do so.

Gas Meters >10m^3 are refurbished after removal from service where commercially viable. All meters are tested and calibrated within Australia with the exception of meters that are larger than or equal to Class 600. This is because Australia does not have calibration and testing facilities for this class. These meters are sent to overseas facilities that are approved by the Australian National Measurement Institute to meet measurement and accuracy requirements for customer billing.

The initial in-service life for diaphragm meters is 15 years. However, in accordance with the requirements of AS 4944, life extension can be justified for diaphragm meters ≤25m^3/hr when supported by a statistical sampling test program. The integrity and technical compliance of gas diaphragm meters is achieved through in-service compliance testing of meters that have been installed for their specified life ensuring that they continue to operate in accordance with the meters' metrological specifications. This drives future renewal and upgrade planning activities.

The amount of new assets installed is driven by customer-initiated connections or market expansion. Meter selection is based on the capacity requirement of the customer.

Residential gas meter performance has been strong and has enabled the meters to remain in service for longer. Fourth life extension test has been introduced. So far, only 2 lots have been tested for fourth life extension. However, when in the absence of statistical testing results, it is assumed our meters will be replaced at 30 years or 35 years by assuming half lot families failing the fourth life extension and the other half passing.

Similarly, for medium-sized industrial and commercial diaphragm meters, only a limited number of third-life extension tests have been conducted to date. However, due to the lack of comprehensive statistical testing results, it is assumed that these meters will be replaced at 25 years, based on the expectation that they would not pass the third-life extension test. The strategy for lifecycle management of residential gas regulators is to operate to failure and replace. All medium pressure horizontal regulators are replaced when found. This group of regulators are susceptible to moisture condensation, freezing and corrosion and present high risks of failing.

10.5.2 WATER MEASUREMENT EQUIPMENT

Water meters provide measurement of water usage by the customer or hot water system. Typically, installations consist of a master cold water meter and individual customer hot water meters. The meters are used to apportion

the use of gas usage by the centralised hot water system to the individual customers on the basis of hot water consumption. Evoenergy has 22,718 water meters installed in the gas network.

10.5.2.1 Performance and requirements

Water meters overall are in good condition. We are actively monitoring the performance of hot water meters to ensure satisfactory performance and they are replaced at the correct age, this is because if the battery is to fail then the customer would receive an estimated read. Over the past five years, a substantial number of water meters have exceeded their nominal replacement age, primarily due to access restrictions during the COVID-19 pandemic and resource shortages.. We will continue to undertake replacement of water meters at a manageable rate where it is safe and prudent to do so.

The current strategy for lifecycle management of water meters is to commence an aged replacement program and progresses from the previous strategy of operate to failure and replace. Where drivers exist strategies will be developed to address specific issues. This includes renewal and upgrade plans.

Water meters are replaced when they become operationally deficient. This is driven by sizing requirements or critical failure. The planned replacement program for water meter populations is driven by the results of the integrity activities. Implementing a policy for aged water meter replacement aims to reduce the volume of corrective maintenance and meter estimations.

10.5.3 DATA COLLECTION EQUIPMENT

We utilise data collection equipment to record and transmit measurement data across the network. Data collection equipment includes:

- **Gas volume correctors** – these are remote electronic devices installed to record pressure and temperature via pulsed signals from the meter and calculate a correction factor to convert actual volumes measured by the meter to the standard billing volume. They are normally installed on sites with consumption greater than 27 TJ or where meters are upstream of gas regulators such as POTS meters; and
- **Industrial data loggers** – there are remote electronic devices installed to record the actual volumes via pulse counting from the meter. They are normally installed on site with consumption greater than 10TJ but less than 27TJ. Data is accumulated in the data loggers and transmitted to a backend platform.
- **Meter data loggers (MDL)** – these are remote electronic devices installed to record actual gas and water consumption volumes via pulse counting from the meter. They are normally installed on the high rise building or medium density. Data is accumulated in the data loggers and transmitted to a backend platform through a communications system for use in billing systems.
- **Radio Frequency (RF)** – These remote electronic devices are installed to record actual gas and water consumption from meters, primarily for legacy meters located inside high-rise buildings or medium-density complexes. The data is collected by a receiver and transmitted to a Bluetooth handheld device, which is then downloaded to a specialized laptop. After verification, the data is compiled and sent in bulk to SAP for billing purposes.

10.5.3.1 Performance and requirements

Data collection equipment is in good condition. However, there is a need to replace some assets due to obsolescence risk.

The strategy for lifecycle management of volume correctors, industrial dataloggers and MDLs is to operate to failure and replace, in accordance with technical regulatory requirements and Jemena Policy – Metering

Equipment Maintenance, Service and Disposal. Jemena is reviewing this strategy due to the cost of failures and maintenance, the telecommunication network upgrade, the age of the units and the improvements in technologies.

The plan is to:

- Continue replacing equipment as they fail;
- Replace all obsolete communications equipment within the next two years;
- Research and introduce competition;
- Replace data collection platform in the next two years; and
- Analysis of failure modes and rates will continue to be undertaken to ensure that maintenance and replacement programs are optimised to ensure the reliable operation of this system.

Plan for Obsolescence

All Metretek units have been upgraded with a 4G kits or substituted with CPA150 dataloggers in response to the decommissioning of the 3G network in Jun 2024. A trial project exploring new remote reading technologies for large industrial and commercial meters is slated to start in the 2025-2026 period. Following this pilot, an engineering assessment will be conducted to determine the optimal solution for mitigating risks associated with device obsolescence and dependency on a single supplier.

All high-rise MDL sites have been converted to a 3G modem due to the NBN rollout where the copper telephone line could no longer be used before 2022. 3G is to be obsolete by June 2024 and a program has been completed to replace all 3G modems with NB-IoT gateways by October 2024. The new communications solution will also remove redundant and unsupported software that was inefficient and contained high operational costs to the business.

10.5.4 GAS QUALITY MEASUREMENT EQUIPMENT

Jemena installs and maintains gas quality measuring equipment and associated communications in the distribution network. This is to ensure that gas quality meets contractual requirements and gas standards. Gas quality measuring equipment includes:

- **Gas chromatographs (GCs-6)** – these instruments analyse the components of gas and measure gas composition ranging from methane to hexane. We use this equipment to calculate gas composition properties. These are important for billing and for unaccounted for gas (UAG) and in particular when there are different sources of gas supplied into a pipeline and/or network; and
- **Hydrocarbon and water dewpoint analysers** – these instruments analyse the hydrocarbon and water content of gas. Gas that does not meet specifications could lead to water and liquid hydrocarbons dropping out of the gas into the pipeline. This could lead to corrosion, blockage of regulators and pipes and interruption of gas supply to townships and end users.
- **Odorant analyser** – this instrument analyses the mercaptans level in the natural gas that gives natural gas a distinctive, strong odour akin to rotten eggs, making it easily detective by human in case of a leak. They ensure the safety of the gas supply by continuously monitoring the mercaptans level. This device plays a crucial role in maintaining regulatory compliance and public safety by guaranteeing that the odorization of natural gas is at levels sufficient to leak detection by individuals, thereby preventing potential gas-related accidents and hazards.

10.5.4.1 Performance and requirements

Gas quality measurement equipment is in good condition. A new odorant analyser has been installed at Watson TRS to monitor the odorant levels in the gas delivered via the APA Dalton – Watson Lateral pipeline entering the Evoenergy gas network.

10.5.5 ACTIVITIES

As new customers connect, we expect to install new meters which are shown below.

Table 10-3: New Meters required due to Customer Initiated New Connections

Market type	RY26	RY27	RY28	RY29	RY30	RY31	RY32
Electricity to Gas	0	0	0	0	0	0	0
New Estates	264	255	244	248	248	245	242
Medium Density/High-rise	25	24	23	24	24	23	23
Industrial and Commercial	9	9	9	9	9	9	9
Total Meters	**9**	**9**	**9**	**9**	**9**	**9**	**9**

(1) The expenditure associated with these new meters is included in the Customer Initiated works.

The table below sets out the planned and defective volume replacement, renewal and upgrade over the AMP period.

Table 10-4: Replacement Meter Program Volumes

Program	RY26	RY27	RY28	RY29	RY30	RY31	RY32
Planned Replacement of Residential Aged Gas Meters & Regulators	3,946	1,015	1,904	1,836	3,349	3,835	3,889
Planned Statistical Sampling of Residential Aged Gas Meters	305	340	305	565	305	260	285
Planned Statistical Sampling of I&C Diaphragm Meters	158	178	186	213	169	258	219
Planned Replacement of I&C Diaphragm Gas Meters & Regulators	5	16	103	123	129	185	93
Planned Replacement of I&C Rotary Gas Meters & Regulators	9	17	38	36	18	108	41
Planned Replacement of I&C Turbine Gas Meters	5	4	2	0	2	4	4
Planned Replacement of Residential Hot Water Meters	1,323	1,342	1,384	1,198	1,226	1,185	1,149
Meter Upgrades Non-Residential	27	27	27	27	27	27	27
Defective Replacement of I&C Turbine Gas Meters	1	1	1	1	1	1	1
Defective Replacement of I&C Diaphragm Gas Meters	12	12	12	12	12	12	12

Program	RY26	RY27	RY28	RY29	RY30	RY31	RY32
Defective Replacement of I&C Rotary Gas Meters	22	22	22	22	22	22	22
Defective Replacement of Residential Gas Meters	302	302	302	302	302	302	302
Defective Replacement of Residential Hot Water Meters	467	467	467	467	467	467	467

11. NON-NETWORK ASSETS (SCADA & RTS)

11.1 OVERVIEW

The ACT Gas Network Supervisory Control and Data Acquisition (SCADA) and Real Time System (RTS) assets are infrastructure put in place by Jemena to enable safe and efficient delivery of gas to the ACT gas network customers, and timely business and operational management decisions to be made. The ACT network leverages the wider Jemena SCADA and RTS assets such as:

- 24/7 'real time' monitoring and control of gas transportation, distribution operations and processes demand forecasting;
- Supply/demand imbalance identification;
- Demand management; and
- Identifying unaccounted for gas issues.

The ease with which real time information can be extracted from the SCADA and RTS assets:-

- Improves the quality and management of ACT Gas Network assets;
- Optimises the reliability and safety of the ACT gas transportation and distribution operations; and
- Optimises the gas network infrastructure asset life and operational costs.

11.2 DESCRIPTION

The ACT SCADA and RTS assets comprise of:

- Purpose built SCADA software that runs on the Jemena Gas Network's system from Open System International (OSII) and Aveva Pi Data Historian system;
- A number of Remote Telemetry Units (RTU) and Dataloggers connected to field control and instrumentation facilities (flow, pressure, and temperature monitoring and control equipment installations) located at strategic locations (gas stations) throughout the ACT Gas Network; and
- A SCADA telecommunications network ensures that information acquired from strategic locations throughout the ACT Gas Network (via the RTUs and associated flow, pressure, temperature monitoring devices etc) and supervisory and control information from the SCADA master station can be moved from their point of original the RTUs or the SCADA master station to a point of consumption (RTUs or SCADA master station ends).

11.3 SCADA SOFTWARE AND NETWORK OPERATION DATA

The software has been purposely designed and configured to meet the ACT Gas Network's specific gas transmission and distribution business and operational needs. Dissemination of the ACT Gas Network's real-time operation data is managed by the Aveva Pi Data Historian System. This includes management of the operational data to assist the business with analytical long term decision making in gas network operations, maintenance, reporting and asset management.

11.4 NETWORK CONTROL AND MONITORING ASSETS

Network Control and Monitoring Assets consist of RTUs located at each Trunk Receiving Station (TRS), Primary Regulating Station (PRS), and some Pressure Monitoring Station (PMS) sites together with their respective field instrumentation and control equipment at each site. A summary of the ACT network control and monitoring assets are shown below.

Table 11-1: Network Control and Monitoring Assets

Site	RTU Type E Series 586	RTU Type SCADAPack 535E	Modem	RTU Type EX8	Transmission Company Equipment	CTS data transfer	RTU Type Sentinel
Watson TRS		1	1			1-APA	
Hoskinstown CTS		1	1		1-EGP		
Bungendore POTS	1		1				
Fyshwick TRS	3		1				
Gungahlin TRS	1		1				
Hume PRS	1		1				
Phillip PRS		1	1				
Hawker (Aranda) PMS							1
Banks PMS							1
Dunlop PMS							1
Farrer PMS							1
Jerrabomberra PMS							1
MacArthur PMS							1
Ngunnawal PMS							1
Hall On Demand				1			
McKellar On Demand				1			
O'Connor On Demand				1			
Red Hill On Demand				1			
Curtin On Demand				1			
Duffy On Demand				1			
Wanniassa On Demand				1			
Theodore On Demand				1			
Queanbeyan OD				1			
Jerrabomberra SRS OD				1			
Weetalabah On Demand				1			

Site	RTU Type E Series 586	RTU Type SCADAPack 535E	Modem	RTU Type EX8	Transmission Company Equipment	CTS data transfer	RTU Type Sentinel
Total	**6**	**3**	**7**	**11**	**1**	**1**[13]	**7**

11.5 STRATEGY

The asset strategy for SCADA and RTS over the AMP period is to ensure:

- The SCADA system continues to function at high levels of reliability, security and availability;
- The continuity, availability and integrity of operational and business intelligence data to Control Centre operations, Real Time system business users and business stakeholders;
- Plan for end-of life;
- Mitigation of SCADA operations risks including Cyber Security threats; and
- Enhancements to improve the efficiency and effectiveness of SCADA and Asset monitoring and operations.

The SCADA and RTS assets lifecycle management plans apply the SCADA and RTS Asset Class Strategy on the known existing assets to identify capital plans and to track risks within the assets.

The lifecycle management plan for each SCADA and RTS asset class is reviewed on an annual basis or whenever there is any significant change implementation to the asset class as a result of any business, facility, system, service provider or functionality change.

11.6 PERFORMANCE

The overall condition is considered satisfactory. Conditions of all ACT Gas Network SCADA and RTS assets are detailed in the SCADA and RTS Asset Class Strategy document. This document is reviewed on an annual basis or whenever there is any business, facility, system or functionality change, which significantly affects this document.

The ACT Gas Network's SCADA and RTS assets are required to operate continuously for as long as possible. There is little to no window for off-line maintenance. Therefore, subsystems are designed with built in redundancies.

The ACT Gas Network's SCADA and RTS asset are operated and maintained in accordance with the SAOP, technical regulatory requirements and Jemena's integrity management plans. These form an integrated system of processes and procedures to achieve efficient management of the asset with respect to levels of service, cost and risk.

The nature of the SCADA and communications asset and environment it operates in, drives the current strategy of 'operate to failure and replace' while being supported by the vendors and telecommunication carriers. However, there are ongoing maintenance activities performed on the assets to ensure the assets remain

[13] Jemena receives CTS information at Watson via SCADA Link to APA.

serviceable. These activities include preventative maintenance and corrective maintenance, as well as specialised maintenance projects or step change activities.

11.7 RISKS AND ISSUES

Business impacts of SCADA and RTS asset failures range from the ACT Gas Networks assets and gas supply becoming unsafe through to minor inconveniences or use of sub-contractors to provide required services while failed services are repaired. The current risk that impacts all businesses is cyber security.

Within the last ten years, fundamental changes have occurred in the very fabric of the information and communications technologies and infrastructures which has made the SCADA network more open to 'outside' connectivity security risks. This issue is being managed under the Operational Technology (OT) security program.

11.8 ACTIVITIES

Assets are scheduled for daily, weekly and monthly operational checks. The types of inspections and tests vary for the different SCADA and RTS asset classes. The key objectives for these scheduled operational checks are to establish if:

- The agreed asset availability and operating pattern are achieved;
- The asset's ability to facilitate transportation of the required quantity and quality of gas within the gas network is operating to the designed conditions and safety standards

Operational replacement of assets on failure will be covered off by Operational Expenditure budgets.

The only Capital Expenditure requirements in the next 7 years for SCADA and RTS, will be the addition of five new RTU EX8 data loggers and the lifecycle replacement of 6 RTUs, when they become obsolete.

12. APPENDIX

12.1 ABBREVIATIONS

ABS	Asset Business Strategy
ACT	Australian Capital Territory
AER	Australian Energy Regulator
ALARP	As Low As Reasonably Practicable
AMP	Asset Management Plan
AMS	Asset Management System
APAIR	Asset Performance and Integrity Report
APGA	Australian Pipeline and Gas Association
AS 2885 ATCC	AS 2885 Assets Technical Code Committee
AS 4645 ATCC	AS 4645 Assets Technical Code Committee
BYDA	Before You Dig Australia
Capex	Capital expenditure
COWP	Capital and Operational Work Plan
CP	Cathodic Protection
CY	Calender Year (1 January - 31 December)
DAMS	Distribution Asset Management Services
DRS	District Regulator Sets
EMP	Environmental Management Plan
EMS	Environmental Management System
EPIs	Environmental Performance Indexes
FSA	Formal Safety Assessments
GIS	Geographic Information System
GSMRC	Gas Safety Management Review Committee
HSE	Health, Safety and Environment
HSEQ	Health, Safety, Environment and Quality
I&C	Industrial and Commercial
JAM	Jemena Asset Management
OMNIA	Jemena Compliance and Risk System
JGN	Jemena Gas Networks
KPIs	Key Performance Indicators
LNG	Liquified Natural Gas
MAOP	Maximum Allowable Operating Pressure
MDL	Meter Data Loggers
NBN	National Broadband Network
NGERS	National Greenhouse and Energy Reporting Scheme
NGL	National Gas Law
NGR	National Gas Rules
NSW	New South Wales
OEMPs	Operational Environmental Management Plans
OHS	Occupational Health and Safety

Opex	Operating Expenditure
OPSO	Over Pressure Shut Off
PE	Polyethylene
PMM	Project Management Methodology
POTS	Packaged Offtake Station
PRS	Primary Regulating Station
RF	Radio Frequency
RTS	Real Time Systems
RTU	Remote Telemetry Unit
RY	Regulatory Year (1 July - 30 June)
SAOP	Safety and Operating Plan
SCADA	Supervisory Control and Data Acquisition
SDRS	Secondary District Regulator Sets
SGSPAA	State Grid Singapore Power (Australia) Assets
SMS	Safety Management Study
TJ	Terajoule
TRIFR	Total Recordable Injury Frequency Rate
TRS	Trunk Receiving Station
UAG	Unaccounted For Gas
WBH	Water Bath Heater