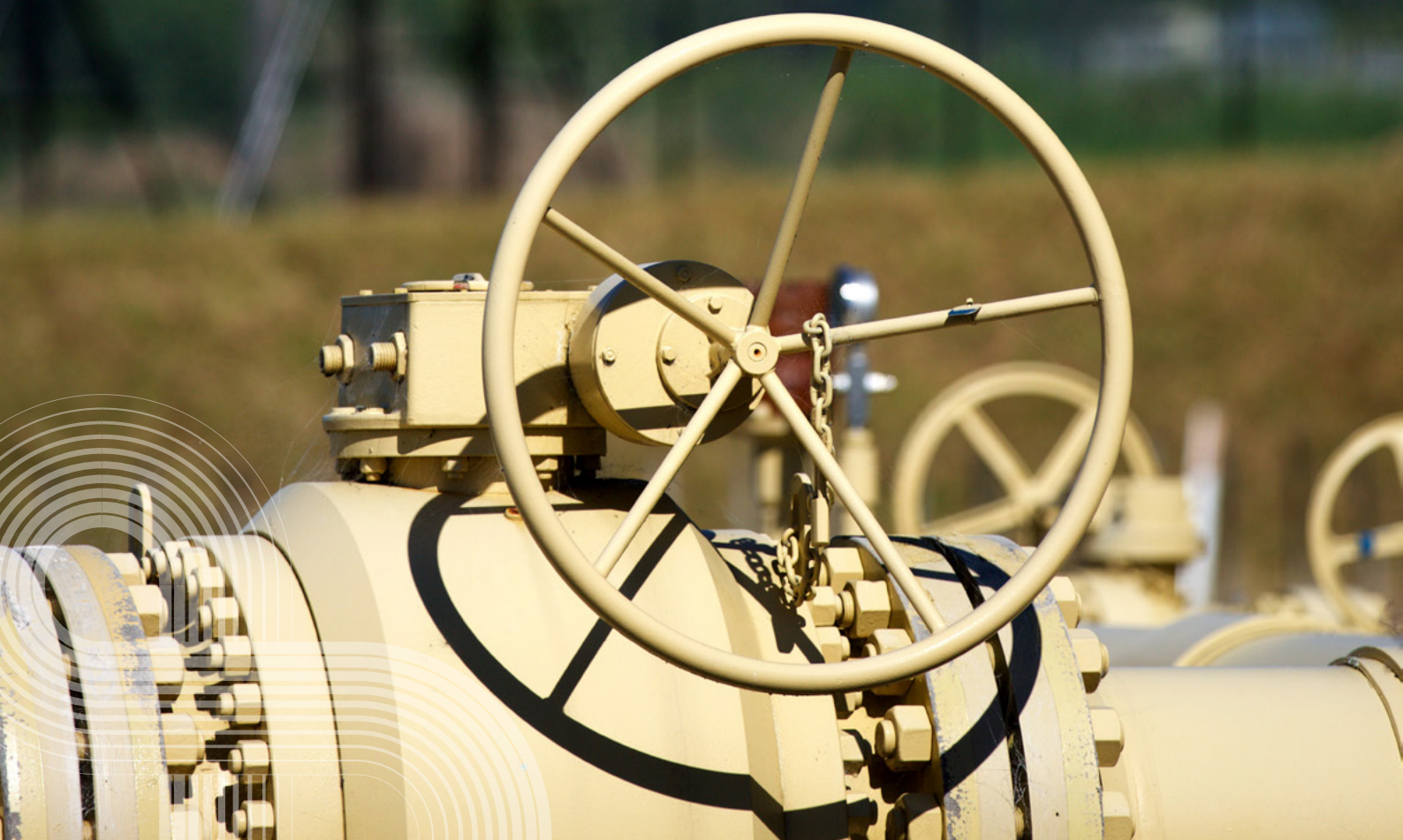





GAS TRANSMISSION Asset Management Plan 2023

AMP Summary Document





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I OREA TE TUATARA KA PUTA KI WAHO

– Ta Hirini Moko Mead

Translation:

*The Tuatara comes out before it is too late.
A problem is solved by continuing to find solutions.*

Message from our Chief Executive

Tēnā koutou katoa and welcome to First Gas Limited's (Firstgas) Gas Transmission Asset Management Plan 2023.

There is no doubt that we are in a critical period for our business, as New Zealand progresses towards achieving net-zero 2050. While opportunity is abundant, we are also faced with uncertainty within the energy sector. Ultimately, we all want a low carbon energy future that's affordable, reliable and meets the diverse needs of all New Zealanders.

This is why Firstgas remains focused on investing in and maintaining a safe, reliable and resilient network for its customers, and also continues to develop and evolve our renewable gas plans, which is reflected in the work that has been achieved over the last 12 months.

The impacts of the severe weather and cyclones early in 2023 reminded us all of the importance of infrastructure resiliency. While there was no significant damage to our transmission network and gas supply continued, we have been looking at how our assets can operate with the likely possibility of more severe weather events in the future.

We have continued to focus on the reliability of the transmission system and maintaining compliance to increase the resilience, security of supply and reduce the emissions of the network. This has been achieved this year with such projects as the Mokau Compressor Station Rewheel and upgrade, the SCADA system upgrade, modifications to the Reporoa delivery point and the acquisition of a ZEVAC compressor - new technology that helps us reduce our emissions.

With a strong interest in the economic and technical regulation of the gas sector, and the wider energy sector, we have provided recommendations on the Climate Change Commission's Draft advice on the second emissions reduction plan, the Commerce Commission IM Review and DDP4 Review and continue to participate in the development of the Governments Gas Transition Plan.

It's no secret that we are a strong and vocal advocate about the future of renewable gas as part of a low carbon energy system. It provides kiwis with energy choice, a more diverse energy system and can use and adapt the gas infrastructure we already have in place.

Substantial work has been done to progress our renewable gas projects this year. We are on track to deliver New Zealand's first, state-of-the-art biogas to biomethane upgrading facility, in Q2 next year. We have also made further progress on the development and planning of our first hydrogen blend trial – also a first for New Zealand.

Looking ahead to next year, we are accelerating into the opportunities that decarbonisation presents, and sharpening our focus. At the heart of our business are our people. We lead a safety-first culture and we work as one dedicated team. We are excited about the future. We have a clear strategy, and a host of opportunities in front of us to make sure New Zealanders are delivered natural gas safely and reliably, right now, while we plan for renewable gas in the future.

I hope you find the 2023 AMP Plan for our gas transmission business both interesting and informative. We look forward to working with you in the coming year and welcome feedback on this year's AMP Summary.

Ngā mihi nui

Paul Goodeve
Chief Executive



Glossary

TERM	DEFINITION
AMMAT	Asset Management Maturity Assessment Tool
AMP	Asset Management Plan
Asset grades	Grade 1: means end of service life, immediate intervention required. Grade 2: means material deterioration but asset condition still within serviceable life parameters. Intervention likely to be required within three years. Grade 3: means normal deterioration requiring regular monitoring. Grade 4: means good or as new condition. Grade unknown: means condition unknown or not yet assessed
Capex	Capital expenditure - The expenditure used to create new or upgrade existing physical assets in the network, as well as non-network assets, e.g. Capital expenditure - the expenditure used to create new or upgrade existing physical assets in the network, as well as non-network assets, e.g. IT or facilities
COO	Chief Operating Officer
CPU	Central Processing Unit
DP	Delivery Point
CCC	Climate Change Commission, government body proposed to be established through the Zero Carbon Bill
CPP	Customised Price-quality Path
DPP	Default Price Path
EDB	Electricity Distribution Business
FEED	Front End Engineering Design
GDB	Gas Distribution Business
FY2019	Financial year ending 30 September 2019
GIC	Gas Industry Company - New Zealand's gas industry co-regulatory body
GM	General Manager
GMS	Gas Measurement System - commonly referred to as a gas meter
GTAC	Gas transmission access code - the proposed single code for the transmission system, replacing the Maui Pipeline Operating Code and the Vector Transmission Code.
GTB	Gas Transmission Business
HDD	Horizontal directional drilling
HSE	Health and Safety in Employment
ICP	Installation Control Point

TERM	DEFINITION
IS	Information Systems
HSEQ	Health, Safety, Environment and Quality
IMs	Input Methodologies - documents set by the Commerce Commission which promote certainty for suppliers and consumers in relation to the rules, requirements, and processes applying to the regulation under Part 4 of the Commerce Act 1986. Input Methodologies - documents set by the Commerce Commission which promote certainty for suppliers and consumers in relation to the rules, requirements, and processes applying to the regulation under Part 4 of the Commerce Act 1986
IT	Information Technology
KGTP	Kapuni Gas Treatment Plant
KPI	Key performance indicators
NZTA	New Zealand Transport Agency
MLV	Main line valve
OATIS	Open Access Transmission Information System
Opex	Operational expenditure - the ongoing costs directly associated with running the Gas Transmission System. This includes costs both directly related to the network (e.g. routine and corrective maintenance, service interruptions/incidents, land management) and non-network related expenditure (e.g. network and business support)
PDP	
PIG	Pipeline inspection gauge tool
Pigging	A method of internally inspecting, cleaning or gauging a high-pressure pipeline, normally while in service to obtain information on pipeline condition
PJ	Petajoule (unit of energy) = 1015 Joules = 1,000 TJ
RAB	Regulated Asset Base
RTE	Response Time to Emergencies
SCADA	Supervisory control and data acquisition
TJ	Terajoule (unit of energy) = 1012 Joules
UAV	Unmanned aerial vehicle

A full glossary is also included in Appendix A - Glossary of the supporting appendices for this Asset Management Plan.

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1. Introduction

This is Firstgas' Gas Transmission Asset Management Plan (AMP) for 2023.

Firstgas, a Firstgas Group company, owns and operates New Zealand's gas transmission system, with over 2500km's of high-pressure pipelines in the North Island. The system transports large volumes of natural gas from production stations to distribution networks and large customers across the North Island.

As the sole provider of gas transmission services, Firstgas is regulated under Part 4 of the Commerce Act 1986 and subject to both price-quality path and information disclosure requirements.

Producing an AMP each year is one of these requirements, as well as being a key document guiding the operations of the business and engagement with customers and stakeholders.

This section outlines the purpose, scope and structure of the 2023 AMP and provides an overview of both the business and the gas transmission system. Key regulatory and environmental changes that are influencing the gas transmission business are also set out.

1.1 Purpose of the Gas Transmission AMP (GTB)

The purpose of the GTB AMP is to describe the asset management processes that are used to manage the gas transmission system and its assets. The AMP focuses on how Firstgas intends to manage these assets over the next 10 years (the planning period) to both achieve asset management objectives and meet stakeholder expectations. It also sets out sufficient information so that customers and stakeholders can understand how key asset-related risks are addressed, the performance targets set for the gas transmission system, and how efficiencies and improvements are being achieved across the business¹.

The AMP also provides the opportunity to update stakeholders on progress against the previous AMP update², and outline key priorities for the year ahead. This is an important part of our ongoing engagement with stakeholders and enables customers to evaluate the value being delivered through capital programme investment.

It will be communicated throughout this AMP, how the following important objectives for the gas transmission system will be achieved:

Safety commitment: the safety of staff, service providers and the general public is paramount.

Engaged stakeholders: consult with stakeholders, particularly on planned investments, and inform stakeholders about the intentions to managing the gas transmission system. This requires Firstgas to provide clear descriptions of all assets, key strategies and objectives.

Performance accountability: provide visibility to stakeholders on performance and information on the performance of the system.

Investment planning: provide visibility of forecasted system investment programmes and upcoming medium-term construction works, with a clear rationale as to why planned investments are the best way to meet service requirements.

Investment planning: provide visibility of forecasted system investment programmes and upcoming medium-term construction works, with a clear rationale as to why planned investments are the best way to meet service requirements.

Informed staff and contractors: provide guidance and clarity on the asset management approach to our employees and service providers that ensures a common understanding and adequate resourcing.

Regulatory compliance: ensure Information Disclosure obligations³ set by the Commerce Commission are met.

1.2 Period covered by the AMP

The AMP covers a ten-year forecast period from 1 October 2023 through to 30 September 2033 (the planning period). This aligns with the financial and pricing year for Firstgas - 1 October to 30 September. The expenditure forecasts presented in this AMP are expressed in constant 2023 prices (unless otherwise stated).

The 2023 AMP for the Firstgas transmission business was approved by the Board of Directors on 20 July 2023.

¹ As specified in section 2.6.2 of the Gas Transmission Information Disclosure Amendments Determination (No.1) 2017, published 14 June 2017, Commerce Commission.

² Gas transmission 2022 AMP update available here: <https://firstgas.co.nz/wp-content/uploads/Firstgas-2022-Transmission-AMP-UpdateFinal.pdf>

³ Gas Transmission Information Disclosure Amendments Determination (No.1) 2017, published 14 June 2017, Commerce Commission.

1.3 Scope of the 2023 AMP

The 2023 AMP sets out planned investments in the gas transmission system during the planning period. It explains how Firstgas will develop the transmission system, renew its assets and undertake maintenance to provide a safe, reliable and valued service to customers.

Expenditure forecasts and planned projects over the 10-year planning period are based on analysis of customer, system and asset information and reflect a high degree of accuracy (to the extent reasonably possible) in the descriptions and forecasts. Capital expenditure (Capex) and operational expenditure (Opex) forecasts as set in the AMP provide important inputs to the Annual Business Plan.

The 2023 AMP complies with the requirements for a full Asset Management Plan, as specified in the Commerce Commission's Information Disclosure Determination. Appendix M – Regulatory Compliance Report provides a detailed reference table, describing compliance with each aspect of the information disclosure requirements.

1.4 Structure of the AMP

The 2023 AMP follows the structure that Firstgas has adopted in previous AMPs and is comprised of two parts:

AMP summary: this standalone document provides an overview of the business, what has been achieved over the past 12 months, and the key activities for the coming year. It also provides a summary of the forecast expenditure over the next 10 years. This document is designed for those customers and stakeholders who want a concise overview of the asset management plan over the planning period.

Supporting appendices: the appendices support the information provided in the standalone summary and provide a much greater level of detail and commentary on the transmission assets and the asset management practices. The appendices also include the regulatory schedules.

The full structure of the 2023 AMP appendices is set out in Table 1 below.

Firstgas also owns and operates a gas distribution business that serves consumers across Northland, Waikato, the Central Plateau, Bay of Plenty, Gisborne and Kapiti. For information on the gas distribution business, please refer to the 2023 Gas Distribution AMP, that can be accessed here www.firstgas.co.nz

Table 1: Structure of the 2023 Transmission AMP

Standalone appendices in one consolidated document

AMP summary document	Provides an overview and summary of the activities Firstgas has undertaken and planned to undertake for the planning period
Appendix A	Glossary
Appendix B	Information Disclosure Schedules
Appendix C	Network Overview
Appendix D	Asset Fleets
Appendix E	System Schematic Diagrams
Appendix F	System Development
Appendix G	Security Standard
Appendix H	Asset Management Approach
Appendix I	Capacity Determination
Appendix J	Expenditure Overview
Appendix K	Scheduled Maintenance
Appendix L	Significant Projects
Appendix M	Regulatory Compliance Report
Appendix N	Director's Certificate

2. Overview of Firstgas

This section introduces the Firstgas business and provides an overview of how the organisation is structured. It also provides key information on the gas transmission system, the approach to asset management and managing risk, and the key regulatory and environmental factors influencing the business over the past year and potential influences in the future.

2.1 Scope of the 2023 AMP

Firstgas is part of Firstgas Group and is owned by funds associated with Igneo Infrastructure Partners, which is part of the First Sentier Investors group, who in turn is part of the Mitsubishi UFJ Financial Group (MUFG). First Sentier Investors is a long-term infrastructure investor with experience in the regulated utility sector with assets across Europe, the United Kingdom, Asia, and New Zealand ⁴.

The creation of Firstgas in 2016 is the first time that gas transmission assets in New Zealand have had a common owner, alongside an extensive distribution network. Firstgas believes that common ownership is delivering three distinct advantages for gas industry participants and consumers:

- A strong commercial interest in maximising the competitiveness of gas.
- To bring new capabilities to the team to capitalise on opportunities in the use of the gas transmission system and gas distribution network.
- An ability to operate the gas transmission system and the gas distribution network and manage assets in ways that better serve the interests of all customers.

Firstgas remains focused on actively promoting the use of gas and ensuring work signalled in the AMP maximises the value obtained from the gas networks.

2.1.1 Firstgas Group Board

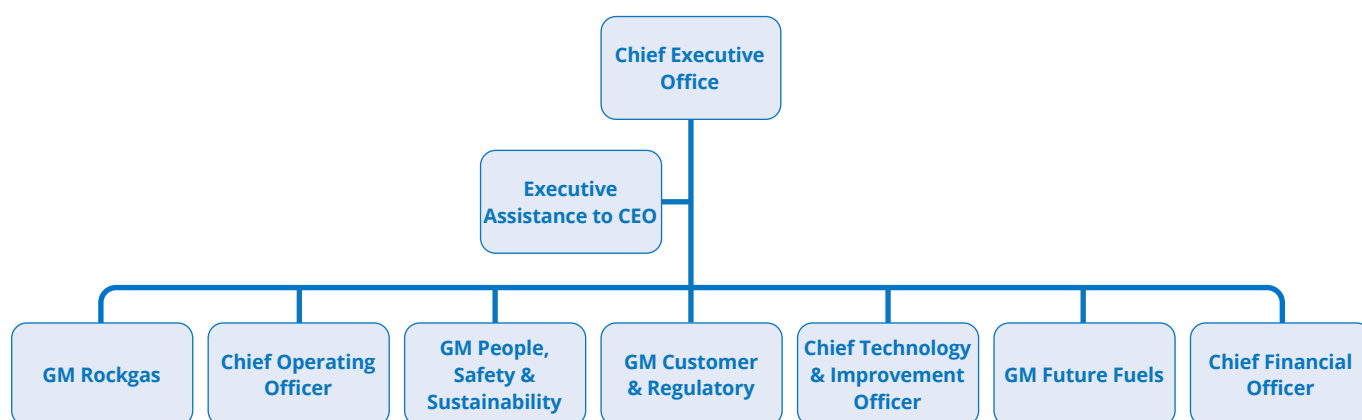
Firstgas Group is governed by a Board of Directors, chaired by Mark Ratcliffe. The Board has a mixture of professional infrastructure experience from both sides of the Tasman. Biographies for the individual Board members are available here www.firstgas.co.nz

2.2 Organisational Structure

Firstgas has approximately 282 staff (excludes Rockgas staff), with most staff based in the corporate headquarters in Bell Block, New Plymouth, with small teams located in Wellington, Auckland, Palmerston North and Hamilton.

The Executive Management team is headed by Chief Executive, Paul Goodeve with eight direct reports. The organisational structure is illustrated in Figure 1 below.

Figure 1: Firstgas Group Organisation chart



⁴ More information on First Sentier Investors is available on their website: <https://www.firstsentierinvestors.com.au/au/en/institutional/about-us/corporate-profile.html>

3. The Gas Transmission Network

Firstgas owns and operates the gas transmission system consisting of underground pipelines, compressor facilities and above ground stations in the North Island of New Zealand. The transmission system incorporates both the Maui and non-Maui⁵ transmission pipelines, as set out in Figure 2 below.

The transmission system is 2,516 kilometres in length, with approximately 146 kilometres installed in urban areas and the remainder in rural areas. The nominal internal diameter of the pipelines range from 50mm to 850mm, with the majority installed below ground. The pipelines connect 252 stations that contain a range of equipment designed to receive, transmit and deliver gas safely and efficiently to customers.

The assets were constructed and commissioned in accordance with the appropriate standards applicable at the time. From the mid-1960s to the mid-1980s, assets were constructed to codes and standards under United States Minimum Federal Safety Standards for Gas Lines - Part 192, United States Department of Transport and United Kingdom Institute of Petroleum. From the mid-1980s and into the 1990s, assets were constructed to the New Zealand gas pipeline code, NZS 5223 - Code of Practice for High Pressure Gas and Petroleum Liquids pipelines. In the late 1990s, the AS 2885 Pipelines - Gas and Liquid Petroleum suite of standards was adopted.

The key statistics for the gas transmission system as of 1 October 2022, are set out in Table 2.

For a full overview of the gas transmission system, please refer to *Appendix C - Network Overview*.



Figure 2: High Pressure Gas Transmission Pipelines

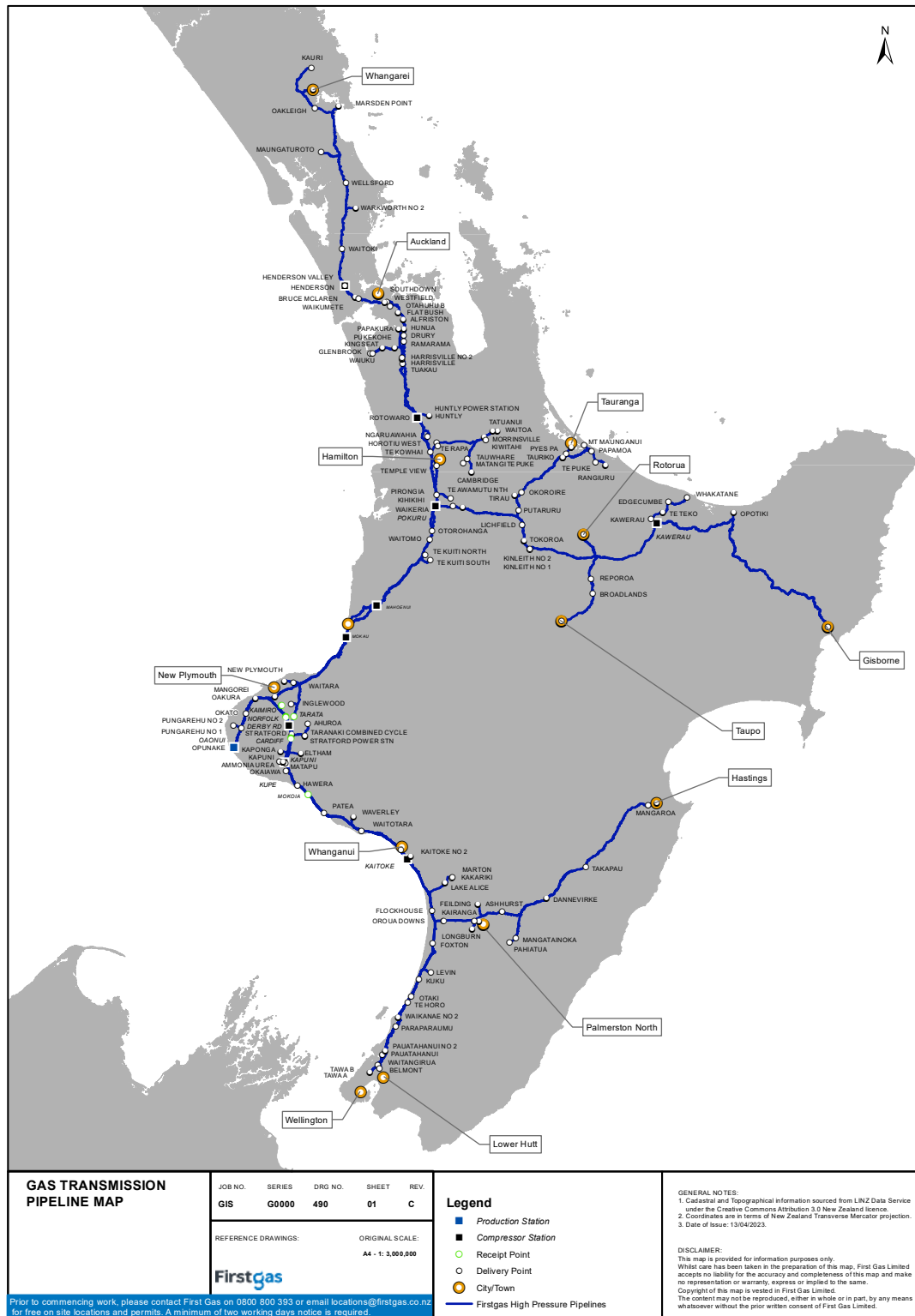


Table 2: Key Gas Transmission Statistics as at 1 October 2022

Statistic	Value
System length (kilometres)	2,516
Compressor stations	9
Compressor units	20
Delivery points	131

5 The gas transmission system purchased from Vector Limited in April 2016

3.1 Asset Categories

Gas transmission networks are made up of several distinct asset types that are categorised to organise the asset base.

Table 3: Asset Categories for Gas Transmission

Asset Category	Description
Pipelines	High-pressure pipelines are constructed from steel with wall thickness and material grades specified by appropriate design codes.
Special crossings	These encompass a variety of crossings installed during pipeline construction. The designs include: <ul style="list-style-type: none"> • Aerial self-supporting pipelines • Pipelines supported by aerial trussed structures • Buried cased crossings where the pipeline is contained in a concentric steel sleeve • Pipelines supported on flexible bearings.
Cathodic protection (CP) system	In addition to their external coating, pipelines are connected to an impressed current and CP system. This provides secondary protection against corrosion at coating breaches by holding the pipeline at a negative voltage relative to the ground.
Off-pipeline assets (on and off easement)	Transmission pipelines are managed through easements. However, in some areas there may be additional assets that are not located within the easement. These are referred to as off-pipeline assets and are predominantly civil construction type assets. These assets may include the following - retired land blocks, access tracks and culverts, crib or retaining walls, fencing and drainage, ground water monitoring equipment and land movement monitoring equipment.
Main line valves	Main line valves (MLVs) are designed to automatically isolate pipeline sections when pipeline failure occurs. MLVs are positioned at maximum intervals of 32 kilometres throughout the length of the gas transmission system, with exception to the Auckland metropolitan area. In Auckland, MLVs are nominally spaced at 13-kilometre intervals due to the higher consequence of pipeline failures.
Compressor stations	Compressor stations are situated at strategic locations and are designed to increase the pressure of the transported gas to ensure that the required gas pressure and quantity is delivered to the extremities of the system. There are reciprocating gas turbine and electric drive compressors in use on the system.
Heating systems	When gas pressure is reduced by pressure regulators at delivery points, the gas temperature reduces. To maintain gas temperature above the lower limit specified in NZS 5442 - Gas specification for reticulated natural gas, heating systems are required.
Odourisation plants	Gas odourisation is used to provide a means for the detection and location of gas escapes. Gas is odourised using electronic pumped odorant injection systems, supported by bulk odorant storage tanks at KGTP and the major receipt points from the Maui transmission pipeline.
Coalescers and filter/separators	Coalescers and filter/separators are used to protect downstream facilities such as compressors, pressure regulators and meters from fine particles of liquid contaminants and impurities in the gas streams.
Metering systems	Metering systems are used to provide accurate gas volume flow data. Meters have rotary-displacement, turbine, ultrasonic, mass flow or diaphragm gas volume measurement mechanisms.
SCADA and communications	The SCADA system constantly monitors asset operating conditions at strategic pipeline locations, including high-volume delivery points and delivery points at pipeline extremities. It also provides remote control of compressors and some MLVs.
Gas chromatographs (GCs)	A GC is a chemical analysis instrument for analysing chemical components in a complex sample. It uses flow through a narrow tube known as a column, through which different chemical constituents of a sample pass in a gas stream (carrier gas, mobile phase) at different rates depending on their chemical and physical properties and their interaction with a specific column filling (stationary phase). As the components exit from the end of the column, they are detected and identified electronically.
PIG launchers and receivers	PIG launchers and receivers facilitate the use of In Line Inspection (ILI) survey tools for pipeline condition monitoring and internal cleaning tools. PIG receivers also act to contain and facilitate safe disposal of debris which is removed from the pipeline by PIGs.
Pressure regulators	Pressure regulators reduce the pressure of the flowing gas to a pre-determined downstream pressure. Pressure regulators form part of delivery point equipment that supplies gas at reduced pressure to gas distribution networks, directly to customers or to downstream parts of the transmission system.
Pressure relief valves	Pressure relief valves are installed to protect pipelines or pressure vessels from over pressurisation. Pressure relief valves limit pressure to a pre-determined value by safely venting gas contained within the protected equipment to the atmosphere.
Isolation valves	Isolation valves are used to isolate sections of station pipe work, instrumentation tubing, equipment or control systems to facilitate maintenance, replacement or emergency shutdown.
Filters	Filters are installed to remove solid particulate contamination from the system and protect downstream equipment from erosion by impingement and blockage from the build-up of contaminants.
Critical spares and equipment	A stock of critical spares and equipment are kept for an anticipated range of pipeline repair options. Whenever new assets are introduced, an evaluation is made of the necessary spares and equipment items required to be retained to support the repair of any equipment failures.

Further information on asset categories is included *Appendix C - Network Overview*.

3.2 Asset Management Approach

The Firstgas approach to asset management is guided by a suite of asset management documents and practices that ensure performance objectives and the expectations of stakeholders is met. The approach incorporates:

Asset Management Framework: ensures alignment between corporate objectives and day-to-day asset management activities. It covers the strategic plan, that guides the subsequent development of the asset management system, asset management policy, objectives and ultimately, this AMP.

Asset Management System: links the corporate objectives and stakeholder needs to specific asset management approaches through the Asset Management. It aligns with the requirements of ISO55001, the international standard for asset management, and seeks to reflect best practice.

Performance Measures: set out the overall asset management performance objectives and key performance indicators (KPIs) that Firstgas regularly monitor to ensure a safe and reliable gas transmission system is provided. Where appropriate, the targets have been developed to align with the definitions developed by the Commerce Commission for information disclosure.

Asset Management Maturity Assessment Tool (AMMAT) and Benchmarking: this discusses the outcome of the AMMAT review and other benchmarking exercises.

The AMP captures the key elements of this asset management document suite in a summarised form and explains the asset management strategy and approach to both internal and external stakeholders. Greater detail on the approach to asset management and KPIs is set out in *Appendix H – Asset Management Approach* and the detailed AMMAT review is included in *Appendix B – Information Disclosure Schedules*.



3.2.1 Managing Firstgas Assets Through Uncertainty

Undoubtedly, as New Zealand progresses towards achieving net zero by 2050, there is significant uncertainty within the energy sector. Despite this uncertainty, we have well-defined programs and areas of focus that require continuous investment. It is crucial that the network maintains its reliability, sustainability and cost-effectiveness for all users while fully understanding the scope and consequences of the network's future.

With significant unknowns regarding the future it is no longer viable to manage assets in a business-as-usual manner. To gain a better understanding of how the assets will be affected during the transition, Firstgas is actively developing a range of scenarios that could potentially represent the future. The objective behind this effort is to formulate an asset management strategy that will safeguard the performance, safety and reliability of its networks well into the future.

The scenarios are not a forecast but a distinctly different view of possible futures which reflect a realistic range of potential outcomes. Under each of these scenarios, Firstgas will evaluate the commercial and technical implications and develop an overall roadmap which will identify key signposts, triggers and decision points providing guidance for decision making.

At the time of drafting the AMP, Firstgas was in the early stages of finalising the different scenarios and will continue with analysis and impact assessments throughout the remainder of FY2023 and into FY2024. The outcome of this analysis will then enable Firstgas to develop an asset management strategy that will reflect the environment in which the business is operating.

3.2.2 Key Asset Focus Areas

In previous publications of the AMP, Firstgas has presented significant information on pipeline integrity management and the importance of effective geohazard management. Whilst this remains a priority throughout the planning period, there are other key asset categories that are the focus of this planning period. The driver for undertaking the work is to increase reliability, which will follow on to cost savings in the longer term.

Focus areas for the planning period are:

- **Network Compression Optimisation**
- **Monitoring and Communications Systems**
- **Heating Systems**



3.2.3 Network Optimisation and Compression

As previously indicated Firstgas has undertaken a review of the required pressures in the network and subsequent needs on the transmission system. The current transmission system utilises several compression stations to ensure that the pressure in the transmission network is maintained at appropriate pressures. These compressor stations were installed many years ago for different operating conditions and flows than currently faced, and are now presenting issues with reliability, efficiency and emissions.

Firstgas has set several strategic objectives for the network optimisation and compression programme. These primarily consist of replacing the existing assets with right sized compressors, reworking network configurations where required to reduce compression requirements, ensuring security of supply on the network, reducing the emissions with the overall aim to reduce or eliminate the need for compression, where practicable, to end up with a highly efficient, safe and reliable network, with lower operating costs.

Firstgas is operating an ageing fleet of compressors and typically the asset life for major components of compressors is reset at major overhauls.

Age related failures however, continue to increase as the overall asset fleet continues to age, resulting in significant defect and corrective operational cost increases to maintain the assets and retain the required level of service. However there comes a point where maintaining existing fleet is not cost effective, with increased expenditure required for major overhauls and increased operational costs.

Firstgas compressor strategic objectives are outlined in greater detail in *Appendix C - Network Overview*.

3.2.4 Network Monitoring and Communications Systems

The Firstgas transmission system is monitored and controlled by a SCADA system on a 24/7 basis. This SCADA system is fundamental to transmission system operations and its use includes coordinating the supply and delivery of gas through the pipelines, balancing available supply against forecast demand, and receiving metering system data.

Communication and control systems are used throughout the transmission network to measure information, ensure safety, provide visibility to various users and enable the network to safely deliver the requirements it must meet.

Several legacy communication systems on the networks are in various stages of being decommissioned. Some of the existing equipment within the existing communication and control system is only designed to work certain technologies, so the obsolescence of the communication system creates a cascade effect, where wider platforms or equipment are rendered obsolete due to unavailability of the communication system.

To address these multiple issues Firstgas has three key actions:

- A SCADA master system replacement project is currently underway
- An Autopoll replacement is under development
- Replacement communications systems for the retiring 2/3G cellular networks

3.2.5 Heating Systems

Heating systems play a crucial role in handling gas within the distribution network, supplying it to gas compressors or end users. A specific maintenance strategy is employed to oversee the management of pressure-containing pipelines and the structure of water bath heaters.

This strategy has led to substantial enhancements in the condition of the heaters' shell and tubes over the past decade. Up until now, the main emphasis has been on adhering to the pressure equipment management plan and ensuring the integrity of the water bath heaters, with other issues addressed on an as required basis. With the integrity plan being closely managed there is capacity to undertake further improvements to the fleet of water bath heaters.

These are:

- Obsolescence of components of the gas fuel train
- Limited space to effectively maintain some of the smaller units
- Incompatible component selection with hazardous areas
- Reliability issues with some heaters – predominantly flame out issues in windy areas
- Limited safety features when compared to new heater installs.

These issues will drive an improvement plan over the course of the planning period.

3.2.6 Geohazard Management

Geohazard is the term used for land instability events, such as landslides, erosion or movement of rocks or debris that have the potential to affect the integrity of transmission pipelines.

The impact of geohazards on the transmission network and how this translates to pipeline integrity risk continues to be a focus for Firstgas. The weather events in the first quarter of 2023 have highlighted how severe weather can exacerbate the impact and limit and limit access to infrastructure. Geohazards are not just constrained to significant weather but can be a result of standard environmental factors. Management of geohazards is an ongoing activity within the transmission business.

Due to advances in technology, software and data management tools have improved the current approach in the following ways to capture all potential geohazards, assess the risk to the transmission pipeline and define mitigation measures to prevent failure including the following:

- Light Detection and Ranging (LiDAR) surveys will be used across all pipeline easements to firstly baseline the ground level and then detect very small ground level changes, which may be related to geohazards or other third-party interference. LiDAR survey information will be able to be loaded into Geographic Information System (GIS).
- Geohazard features that are impacting the gas pipeline will be identified using strain monitoring information, obtained during regular intelligent inline inspection (ILI) surveys. These surveys will utilise an inertial mapping unit to identify regions of high bending strain on the pipeline.
- Line walking surveys will be undertaken on all pipelines where ILI with bending strain analysis is not possible
- Pipeline risks will be evaluated in the asset risk system and actions to mitigate the risk will be identified. Where a pipeline risk is sufficiently high and the mitigation solution will take several months or years to complete and interim mitigation measures will not reduce the risk to an acceptable level, then an emergency response plan will be developed, to be able to respond immediately if the risk escalates. The action to develop an emergency response plan will be recorded against the risk, with an agreed timeframe to complete.
- The ability to overlay outcomes from safety management studies, the impact of land use changes, and identification of geohazards in a layered approach, has resulted in the need to develop a programme of work to upgrade pipelines that can utilise the inline inspection process as a method to monitor the condition of pipelines.
- Increasing the number of pipelines that have the capability to run In-line-Inspection (ILI) tools. The completion of the physical works was planned for completion in FY2023. However, a delay has pushed completion to FY2025, enabling the first of the newly pigging sections to be run by mid FY2026. This will increase the ILI coverage from 71% to 86% of the transmission system, with a target of 90% by FY2026 post further engineering work and inspection.

3.2.7 Impacts From Recent Cyclone Hale and Gabrielle.

New Zealand experienced two significant weather events in the first quarter of 2023. Cyclones Hale and Gabrielle. This has impacted on the pipelines with numerous washouts and slips across the network, with each location requiring an assessment to determine the impact to the pipelines and to establish what long-term remediation plans are required.

Firstgas mobilised the emergency management teams to coordinate the responses to the weather events. Firstgas emergency management is aligned to the National Coordinated Incident Management System that provides the structure for the command, control and coordination of an emergency response. This enables Firstgas to coordinate better with other emergency response agencies using common terminology, structure and processes.

Notable occurrences from the cyclones are:

- The severe rainfall resulted in significant erosion of a stream running adjacent to the 800 and 805 pipelines near Te Puke. This affected a span area of the 805 pipeline being exposed and the 800 pipeline is also in danger of being exposed if any further slippage or erosion events happen.
- Cyclone Gabrielle's significant water flow exposed the 505 pipeline that supplies gas to Gisborne. A contractor has been engaged to plan the remediation work of the pipe which is scheduled to be completed in Q3 FY2023.
- Following Cyclone Gabrielle, Firstgas has identified 85 sites that require assessment. For 31 of these sites further remedial action is required that will necessitate scheduling work programmes over the course of the planning period.

4. The Regulatory Framework

This section provides an overview of the changes in the regulatory environment for the gas transmission business. Discussion on the refinements to the Part 4 regulatory regime overseen by the Commerce Commission, along with the Government's increased focus on climate change and the impact this will have on Firstgas' business.



4.1 Input Methodology (IM) Review

The Commerce Commission has commenced its review of the Input Methodologies (IM) for Gas Distribution Businesses, electricity distribution businesses and airports. The IMs must be reviewed every seven years, with this review due to be completed by December 2023. All sectors are facing uncertainty, different challenges and opportunities, that will influence the matters that should be considered through this review.

The Commerce Commission has issued a draft decision on the Input Methodologies for the gas pipeline businesses. Firstgas remains focussed on advocating for IMs settings that:

- Reduce the risk of future price escalation and economic asset stranding.
- Continue to provide sufficient incentives to invest to maintain reliable infrastructure.
- Preserve the option of using current gas infrastructure for renewable gasses in the future.

Firstgas looks forward to engagement with the Commerce Commission and stakeholders through the consultation process, to ensure that the regulatory framework supports New Zealand's transition to net zero carbon emissions by 2050.

4.2 Gas Transition Plan

The Government is working to develop an equitable plan for the transition of the fossil gas sector and will be a key input into the Government's energy strategy. The intent of the Gas Transition Plan (GTP) is to articulate the transition pathway for the phase-out of fossil gas over time, including where and when renewable gasses may be required to offset fossil gas use and associated emissions.

The GTP⁶ will outline steps required to decarbonise and reduce reliance on fossil gas while still providing for some fossil gas use to 2035. The work is being led by the Ministry of Business Innovation and Employment (MBIE) and is working with the Gas Industry Company (GIC) to develop the plan. The plan is expected to be completed by the end of 2023.

The desired outcomes from the overall transition for fossil gas out to 2035 is:

- **Sustainability** – Aotearoa New Zealand avoids making decision that further locks in reliance on fossil fuels.
- **Energy Security** – security of supply is maintained through the transition, as fossil gas continues to be progressively displaced by renewable, lower emission alternatives.
- **Energy Equity** – adverse and unexpected effects on fossil gas consumers are prevented or mitigated and consumers retain access to affordable, reliable, and abundant energy. This includes minimising the broader effects on prices paid by consumers, as well as pricing inputs for businesses through the transition.
- **Emissions reductions** – Aotearoa, New Zealand prioritises reducing emissions in the most economically efficient way. The pace of emissions reductions will need to support Aotearoa's emission budgets and 2050 emissions targets.
- **Energy conservation and efficiency** – energy conservation and efficiency play a key role in the overall transition.

The Gas Transition Plan is framed around two pillars.

Pillar One:

Transition pathways for the fossil fuels gas sector, focusing on articulating transition pathways for the fossil gas sector.

Pillar Two:

This is intended to develop a cohesive view on renewable gas market developments, including how New Zealand could effectively reduce emissions and lower transition costs for fossil gas consumers.

This focus will also include the role for renewable gases (including green hydrogen, biomethane and renewable Liquid Petroleum Gas (rLPG)) to help support the reduction in emissions from this sector.

⁶ Source: MBIE Gas Transition Plan Terms of reference. Link [here](#)

5. Preparing the Business for the Future

Firstgas is committed to ensuring that energy can be delivered safely and reliably and is affordable and acceptable to New Zealand families and businesses, both now and into the future.

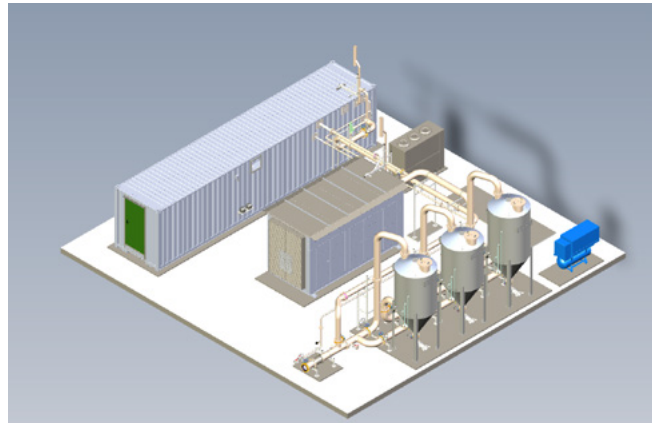


5.1 Renewable Gas Work Programme

Firstgas is playing a leading role in the investigation and development of renewable gas – a necessary partner to the electricity grid in decarbonising New Zealand’s energy supply.

Substantial work has been done to progress our renewable gas projects this year. We are on track to deliver New Zealand’s first, state-of-the-art biogas to biomethane upgrading facility, in Q2 next year. We have also made further progress on the development and planning for the hydrogen blend trial – also a first for New Zealand.

Firstgas is continuing with its work in how hydrogen can be utilised as a way to decarbonise parts of the energy eco-system, suited to hard-to-treat emissions, and it provides similar storage benefits as natural gas. Blending hydrogen offers a lower cost energy transition as it allows for the use of existing infrastructure to benefit New Zealand and supports the Government’s Renewable Energy Strategy.



5.2 Biomethane to Pipeline Facility

Firstgas believes that biomethane can form part of the transition to renewable gases. Production and utilisation of biomethane via digestion of organic wastes and processing the raw biogas creates benefits for gas users, waste generators, asset owners, their communities, and the environment. The technology for biomethane production is mature and with treatment, biomethane can be used as a direct replacement for methane in the gas pipeline.

A state-of-the-art facility has been built and officially opened in October 2022 at and transformation of kerbside food waste collected, into biogas

First Renewables Limited ⁷ in partnership with Ecogas is building a state-of-the-art biogas to pipeline facility at Ecogas’ Organics Processing Facility in Reporoa. The facility will start transforming kerbside food waste into biomethane, a valuable source of renewable gas, from the second quarter of 2024.

Australian company, Eneraque has been commissioned to supply the compressor, which forms an essential part of the facility, the compressor will take the biogas from the anaerobic digesters and send it through the upgrading process, turning it into biomethane, the low carbon equivalent to natural gas. The pressure generated by the compressor then allows the biomethane to be transported through the pipeline to customers on our network.

The equipment is due to arrive in the country by September 2023 and installed. The initial estimated production will supply enough renewable gas, equivalent to supplying 7200 homes and avoiding about 11,000 tonnes of CO² per year.

In the future Firstgas Group would like to see the development of multiple renewable gas to pipeline facilities in New Zealand, that could produce enough renewable gas to supply all residential users and three quarters of commercial gas users with low carbon gas, equivalent to taking 415,000 petrol cars off the roads.

⁷ First Renewables is a Firstgas Group Company

5.3 Hydrogen Blend Trial

Firstgas believes that Hydrogen can play an important role in decarbonising the gas pipeline network. The conversion to hydrogen is complex and Firstgas has established several work programmes to understand how existing infrastructure can be used to transport green hydrogen.



5.3.1 Work Programmes:

The following work programmes are currently underway:

- Consider the technical feasibility of converting the gas grid
- Technical trials - to blend hydrogen into a natural gas pipeline to further our programme to convert the grid to hydrogen.
- Assess the potential sources and uses for hydrogen/hydrogen blends.
- Establish the economics of decarbonisation using hydrogen.

5.3.2 Technical Feasibility

The following two studies were identified as key next steps resulting from the NZ Hydrogen Feasibility study (2021 by Element Energy). The study outlined the requirement to identify the materials and appliances used in New Zealand and assess their compatibility for service.

5.3.3 Network Material Compatibility Study:

A key area identified but not fully understood, is a detailed material list of all items used on the transmission and distribution networks and whether these are compatible with hydrogen blends of up to 20% (by volume). This information is required to ensure that sufficient knowledge is available to confirm all equipment will operate as intended and identify any knowledge gaps that may currently exist or areas of significant concern.

Undertaking this study will help identify network segments which can be used in a blended hydrogen service, identify areas where hydrogen repurposing is not possible or will require additional expenditure or operational constraints to be realised. The outputs of this study are intended to provide strategic guidance on the future use of the network in a blended hydrogen service.

5.3.4 Network Appliance Compatibility Study:

Another key area identified and not fully understood at this time, is the specific type of appliances used on the network and their compatibility with hydrogen blends.

This study will help identify the population of appliances installed on the gas network and whether appliances which are certified for use in New Zealand for natural gas, are also suitable for use with hydrogen blends. The outputs of this study are intended to provide guidance for future stages of trialling hydrogen blending.

Firstgas has received the reports and is currently reviewing the content that will inform us of the next actions required.

5.3.5 Technical Trial - Hydrogen Blending Project

The hydrogen blend trial will include all aspects of designing, constructing, and testing the gas delivery pipeline assets. As well as the collation and documenting evidence and subsequent engagement necessary to obtain an exemption from Worksafe to the requirements defined in the Gas (Safety and Measurement) Regulations 2010, which will allow the trial to commence.

The trial will commence with a low level of hydrogen and incrementally increase towards a nominal 10%, ensuring the Wobbe Index is at or above the minimum legal requirement.

Key aspects of phase one of the trial development are as follows:

- Study to determine whether the current network can deliver enough energy to meet projected demand and the modifications required.
- Stakeholder engagement - confirming the partners involved in and affected by the trial
- Consumer equipment assessment
- Define the scope and duration of the trial including Worksafe testing requirements
- Technical evidencing
- Design and installation of the hydrogen blending facility.

A section of the network has been selected to undertake the trial, with the project now moving into the final stages of planning prior to execution.

5.4 Partnering with Powering Change - for the Future of Aotearoa

The energy sector will play a key role in helping to reduce emissions and that is why New Zealand's energy companies, including Firstgas Group, have teamed up to create Powering Change, a collective commitment to a more sustainable future for Aotearoa New Zealand.

Powering Change means continuing to make existing energy systems smarter and transforming them to be built around all customers. It means finding better ways to generate, store and use energy, and unlock the potential of technology to get more out of the current energy infrastructure.

Firstgas Group has been involved from the initial planning stages of Powering Change with team members included on the steering group and communications working group. Phase one of the Powering Change campaign saw the launch of its website in 2022 and phase two of the campaign was initiated in August 2023 to create greater awareness and profile of the renewable energy activities Powering Change members are involved in.



Powering Change is not just a name; it's a pledge to Aotearoa New Zealand and it embodies the belief that we can and will meet goals and it is the guiding light that will influence actions on the journey to a more sustainable future. To help us all get there, six key principles have been defined to help steer that journey:

POWERING CHOICE

New Zealand energy users are at the heart of this journey as energy systems become smarter and are transformed around customers' needs; and as new ways of producing, storing, supplying electricity and gas are developed, customers should be able to choose the products they need and how they use their energy.

POWERING INNOVATION

The energy systems are already changing rapidly and as the need for renewable energy grows, the ways to meet that demand will innovate and evolve change to accommodate the needs of all customer types. Innovation, fostering creativity and improving customer choices to reduce emissions is encouraged. Developing new products and finding better ways to do things will play a big part in helping to achieve that and all while ensuring power remains firmly in the hands of the customers.

POWERING AFFORDABILITY

Affordable energy for all New Zealand families and businesses is paramount. The scale of investment required over the coming decades is significant – but the Power Change collaboration is committed to ensuring this investment will not create new problems for households already struggling to meet their energy needs. Conversion to renewable energy has the potential to improve affordability for customers, and we are committed to making this happen.

POWERING RELIABILITY

As a growing proportion of the system will be running on renewable electricity, this heightens the need for a secure reliable service that is critical for all customers. A diverse range of energy sources will be needed to power New Zealand, including natural gas as a transition fuel, so that when the lakes are low and wind and solar are in short supply, power can continue to be supplied to New Zealanders as and when needed.

POWERING COLLABORATION

Moving towards a more renewable energy system will involve all New Zealand families, businesses, and communities. Everyone must have the opportunity to have a say as we work effectively with businesses, government, community, and iwi, to ensure decisions and choices benefit the future of Aotearoa as a whole. This will require collaboration across both the gas sector and the broader energy system.

POWERING CARE FOR THE ENVIRONMENT

The existing renewable energy system relies on the natural environment, it also has the potential to impact the environment, therefore as the system evolves, local guidance will be sought to ensure the natural resources we all rely on are always valued and respected.

To find out more, visit poweringchange.nz



5.5 Emissions Reductions

In support of the New Zealand Government's commitments to reach net zero carbon by 2050, Firstgas aims to reduce methane leakage emissions associated with its gas transmission, gas distribution, and Flexgas storage assets by at least 30% percent by 2030, compared to the 2020 levels. It will further aim to reduce emissions towards a net zeromethane leakage emissions level by 2050.

The following areas have been identified as opportunities for improvement in relation to emission reductions:

- System pressure management
- Leak detection
- Replacement of network assets as appropriate to reduce emissions.

Firstgas is currently evaluating the opportunities for emissions reductions to prioritise activities that will bring the most value to the organisation.

5.5.1 Emissions Reductions Initiative

Firstgas has purchased a Zero Emissions Vacuum Compressor (ZEVAC) for its network. The unit will primarily be used during maintenance work when there is a need to capture gas that would otherwise have been vented. Instead it compresses the gas and reinjects it back into the network. It is expected to save up to 35 tonnes of carbon emissions a year from planned maintenance work.



6. Year in Review

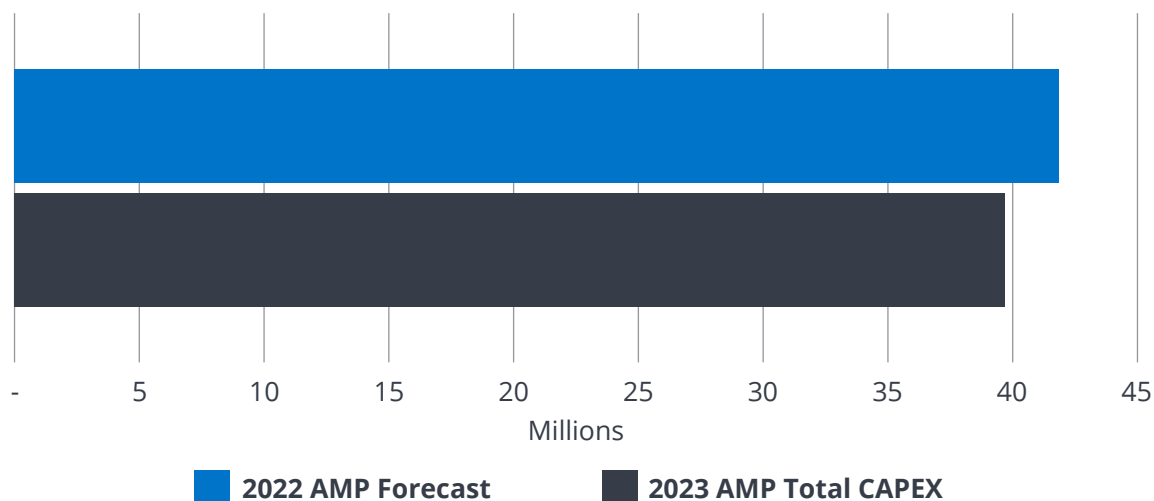
This section provides an overview of major projects and initiatives over the past year ending 30 September 2023, the first year of the DPP reset for 2023 - 2026. Forecast expenditure against the plans stated in the 2022 AMP are reviewed in this section.



6.1 Expenditure summary

Firstgas remains focused on creating and maintaining a safe and resilient network for customers, as well as preparing for the transition to net zero carbon and this is reflected in the work that has been undertaken over the last 12 months. Figures 5 and 6 outline the actual expenditure for the year ended 30 September 2023⁸ and compare actual expenditure to the forecasts presented in the previous AMP update.

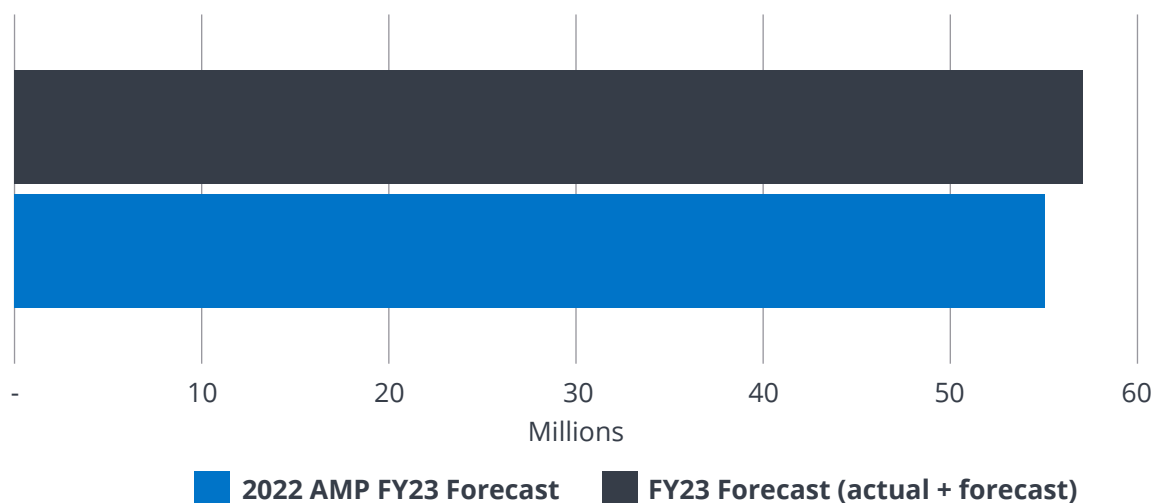
Figure 5: Total Capex in FY2023 versus forecast expenditure in 2022 AMP Update



Major variances in expenditure for FY2023 relate to:

- Delay for approval for the Kaitoke Compression upgrade, the expenditure has been reforecast into FY2024.

Figure 6: Opex in FY2023 versus forecast expenditure in 2022 AMP Update



The increased spend is in relation to:

- Increase spend in response to the severe weather events in FY2023

⁸ All data from 1 June 2022 to 30 September 2023 has been forecast, in order to provide a complete 12 months of data.

6.2 Significant Activities Undertaken in FY2023

Firstgas has continued with a high level of works to deliver, and has continued to focus on the reliability of the system and maintaining compliance with its Inline Inspection programme.

Table 4: Significant projects completed in FY2023

Significant projects ⁹ in FY2023		
Increasing resilience of the network		
Kaitoke Compressor Station optimisation	\$4.6m	Outlined in the 2022 AMP Update
Mokau Compressor Station Rewheel and upgrade	\$1.6m	
SCADA System Upgrade	\$1.3m	
Delivery Point Hydrogen Trial	\$0.94m	
KGTP Compressor Cooler replacement	\$0.87m	
300 pipeline ILI enabling	\$0.82m	
Inline inspection	\$m	
Wellsfords DP Launcher and Receiver Upgrade	\$0.62	
200 Pipeline Kiwi rail Drury Realignment	\$0.58	
Reporoa Delivery point modifications	\$0.57m	

6.2.1 Kaitoke Compression Upgrade

The network optimisation and compression strategy considered the long-term needs of the network and through the process it was evident that making changes to the southern system in the short term would provide significant benefits. Reduced long term operational costs, increased security of supply, better reliability and reduced emissions. The review highlighted that the existing compressors are poorly sized for the demand and the units are the least reliable in the fleet and increased operational costs to maintain the expected levels of service are being experienced.

Compression located at Kaitoke is a central requirement to meeting current loads in the southern system during winter peaks. Compression cannot be moved significantly further upstream without the discharge pressure required to meet current winter loads exceeding the pipeline MAOP. Kaitoke is also favourably located relative to the Taranaki basin, such that with suitably sized compressors installed at Kaitoke, this location alone can complete all compression duties required on the 100 pipeline south, without the need for compression anywhere upstream (at Kapuni or any other location).

No amount of compression at Kapuni will remove the requirement for compression at Kaitoke in the winter months, based on the load profile.

The proposed installation is comprised of two 50% duty machines, based on peak winter flows, which have been selected for several key reasons:

On commissioning of the project, the two new smaller compressors will replace the existing unit#1. These units will provide compression and operate in parallel with the existing unit #2 on site. This will provide adequate levels of line pack in the Wellington pipeline to ensure critical contingency management requirements are met. By utilising two small units, as the seasonal flows reduce the compressor station will be operating at a higher efficiency and reduce emissions.

The bulk of the procurement and construction costs will be completed in FY2024.

⁹ Expenditure expressed is expenditure within the FY2023 year – and may not represent the full anticipated project cost.

6.2.2 Mokau Compressor Re-Wheeling

Central to the compression and optimisation strategy Firstgas has developed, is to use Mokau CS as the primary compression location on the network for the 400 and 500 pipelines north of Taranaki. The network optimisation strategy requires that the discharge pressure out of the Mokau compressor station is raised sufficiently to enable Rotowaro and Pokuru compressor stations to potentially be shut off for large periods of the year, while being able to handle swings in operational imbalances that occur throughout each day.

This will enable the compressors to operate in the most efficient areas of the performance curve, reducing fuel costs and emission reductions, whilst being able to meet the operational needs.

Re-wheeling of compressors alters the performance characteristics of the unit and will balance the performance across both turbine units.

Performance and modifications include:

- Ability to work with as large operational imbalance as possible
- Discharge pressure to be as high as possible
- N+1 compressor redundancy (matched compressors performance)

Install a dry gas seal system. Dry gas sealing systems retrofitted into centrifugal compressors are now recognised as a cost-effective means of improving equipment performance.

6.2.3 SCADA System Replacement

The existing SCADA master terminal has reached the end of its service life and a number of the components are obsolete, which makes the system vulnerable. The system needs to be replaced.

The project is complex, with a number of key aspects planned to be completed in FY2023. Currently, detailed design is underway, with new architecture signed-off and moving into development phase. In addition to the SCADA replacement other enabling works running concurrently are:

- A new electrical distribution board upgrade is required
- The new disaster recovery server housing is required

- The enabling works must be completed prior to Site Access Testing (SAT)
- The current schedule has Factory Acceptance Testing (FAT) set up starting in September 2023, with a planned completion in December 2023
- Site acceptance testing (SAT) setup will commence in December 2023, with testing planned to commence in January 2024. The SAT will require the setting up of 132 sites and is planned to be commissioned July 2024.

6.2.4 Delivery Point Hydrogen Trial

As detailed in section 5.3, Firstgas is undertaking a trial to blend of hydrogen into the network to assess the performance and impact of hydrogen. This trial will include all aspects of designing, constructing, and testing the gas delivery assets, as well as the collation and documenting evidence and subsequent engagement necessary to obtain an exemption from Worksafe to the requirements defined in the Gas (Safety and Measurement) Regulations 2010, which allows the trial to commence.

A location has been selected to conduct hydrogen blending injection testing, and supplying domestic consumers is included in this scope. The blended gas trial will commence with a low level of hydrogen and incrementally increase towards a nominal 10%. Ensuring that the gas specification Wobbe index is at or above the minimum requirement. The outcome of the trial will provide technical evidencing of the feasibility of conversion of other networks to a hydrogen blend.

6.2.5 Pipeline Inline Inspections

Pipeline inline inspection is a primary condition monitoring tool used for the ongoing management of the transmission pipeline network. Scheduled inline inspections are planned to be completed on an annual basis.

The following pipelines are planned to be completed in FY2023

Pipeline	Location
403 Pipeline	Huntly Offtake to Huntly Powerstation
700 Pipeline	Feilding to Hastings
430 Pipeline	Westfield to Maungatapere
800 Pipeline	Lichfield to Kaimai
300 Pipeline	Kapuni Gas Treatment Plant to Frankley Road
400 Pipeline	Oaonui to Huntly Offtake

6.2.6 Asset Relocation: 200 Line Kiwirail Realignment

Kiwirail intend to construct a new station at Drury near Auckland, that will be located over the existing 200 pipeline. Alignment of the pipeline is required to circumvent the area of major development and construction activity for expected population density and growth. The new pipeline will be suitably designed for high density regions and adequately protected. This project is driven by 3rd party requirements and timeline. The project is currently on hold until stakeholders are ready to progress with the execution of the works, which is anticipated to take about 14 months.

6.2.9 Reporoa Delivery Point Modifications

Due to low gas velocity, the 508 pipeline is not inspected utilising the inline inspection. Firstgas has a programme in place to increase the number of pipelines that are pigged as this is a primary tool for monitoring pipeline integrity. Pressure reduction will also enable the injection of biogas from the neighbouring biogas production facility.

The project requires the decommissioning of an existing main line valve, modifications of the pigging facilities to enable combination inline inspection

tools and replacement of the existing pressure control regulators. The site will also have power, SCADA and RTU installed on site. This will enable a new bidirectional interconnection to be installed, along with metering and a gas analyser.

6.2.7 Wellsford Pigging Facilities Upgrade

Inline inspection is a primary pipeline condition monitoring tool used to monitor the condition of its pipelines. Firstgas has a programme in place to increase the overall number of pipelines that are piggable, or upgrade the existing in-line inspection facilities to enable to use of current inspection tool configurations, reduce operational risks and comply with minimum industry safety requirements.

Launcher and receivers located at Wellsford delivery point are too short to accommodate multi-vehicle combination tools and require modification.

The scope of the work includes:

- Design of a new pig launcher and receiver and associated pipework and supports
- Fabrication of new pig launcher and receiver and associated piping and support footings
- Construction of new supports for new equipment and associated piping.

6.2.8 300 Pipeline Inline Inspection Enabling Works

A modification was required to enable the Inline Inspection of the 300 pipeline. The current configuration has an injection point on the 300 pipeline that enables gas flow in both directions that makes pigging operations impossible. Interrupting the flow from the injection party would result in considerable disruption to the wider gas market. To enable pigging operations, the solution is to tie the 309 lateral in to the 300 pipeline to enable the completion of the in-line inspection, this will enable future pigging to be completed without disruption.



6.2.10 800 Line Washout

Following Cyclone Hale in January sections of the 800 line were exposed. Flooding of a nearby stream resulted in the erosion and collapse of the riverbank. Short term actions were to install temporary anchors and supports whilst the risk was evaluated, and a mitigation plan put into place.

To reduce the risk, a temporary bypass has been installed to enable the affected section of pipeline to be depressurised, whilst maintaining supply to the network. Scope of the work for the temporary bypass include fabrication of new pipe section spools, that are installed in trenches, and tie-ins to the main pipe. It is envisaged that this will remain in place for approximately six months whilst a permanent solution can be developed and executed.



6.2.11 505 Line Washout

In February, an intense subtropical storm caused widespread flooding in the Gisborne, Tairāwhiti region. The high levels of rainfall led to rivers rising and flooding, with the Waipaoa River reaching a peak of 12.8 meters, the highest ever recorded. The 505 line, which runs along the western edge of the valley following the alignment of the former Moutohora Branch railway, was also affected by the flooding. The railway cutting in by the southwestern corner of the valley provided an outlet for the flood waters to drain to the lower lands in the southwest.

The remedial solution is targeted at reinstating the farm track by backfilling and reinforcing the impacted sections. A design consultant has been engaged for design review. The intent of the works is to mitigate the impact of the track by possible future episodic/extreme flood events.



6.3 Asset Management Improvement Programme

Firstgas has engaged with external consultants (Assetivity¹⁰) to provide independent advice on the maturity of asset management with two key objectives:

- To identify any gaps between current state and the state required to achieve alignment to ISO 55001: 2014
- From that gap analysis, develop recommendations and a roadmap that would establish a clear path to improvement against ISO 55001: 2014 for the Company's regulated businesses.

These have been shaped into a roadmap for achieving full compliance by the end of FY2024.

6.4 Performance of the Transmission System

A key premise for the AMP is that existing reliability, safety and supply quality levels will be maintained and improved. Targets have been set to help drive performance improvements and measure progress by delivering a reliable, safe and high-quality service (these targets are detailed in Appendix H – Asset Management Approach).

The following table shows that Firstgas has seen improvements or maintained 100% compliance across several areas over the past three years (displayed in green) and has also seen performance fall in some areas (displayed in red).

Fig 9: Key Performance Indicator Trend Table

Key performance indicator	2022	Trend	Target
Safety: Lost time injuries	0	Steady	0
Response time to emergencies	100%	Steady	100%
Unplanned interruptions	0	Steady	0
Major interruptions	0	Steady	0
Environmental	0	Steady	0
Asset Management Maturity Assessment	2.7	Steady	3
Public Reported Escapes and Gas Leaks	1.59	Decreasing	<5
Compressor Reliability	88.6	Decreasing	>97%
Lloyds annual audit compliance	2	Steady	0
Compressor availability	92%	Declining	>95%

Additional information regarding KPIs and targets is included in *Appendix H – Asset Management Approach*.

¹⁰ Assetivity is a member of the Endorsed Assessor Scheme (EAS) with the Institute of Asset Management (IAM), Assetivity is authorised to conduct assessments and issue certificates of compliance with the requirements of ISO 55001: 2014.

¹¹ Firstgas engaged Assetivity, an external IAMs accredited body to conduct a gap assessment to our alignment with ISO55001:2014 standard. This included an Asset Management Maturity Assessment against that standard.

¹² Firstgas has aligned the AMMAT schedule 13 results to the Assetivity assessment, which is aligned to ISO55001:2014.

7. The Year Ahead

This section sets out the areas of focus for Firstgas over the coming year, commencing 1 October 23, the second year of the DPP reset for 2023-2026. The focus remains on providing customers with a safe and resilient transmission system, while maturing and optimising the approach to asset management and future opportunities.

7.1 Significant Activities for FY2024

Table 5 sets out the major activities Firstgas plans to undertake throughout FY2024.

Table 5: Significant projects for FY2024

Significant projects	
Increasing resilience of the network	
Compression strategy Kaitoke Compressor Station	\$18 million
Geohazard management	\$6 million
SCADA Master System replacement	\$3.5million
Pipeline inline inspections	\$4.7 million
Heating systems	\$3 million

7.1.1 Geohazard Management

A number of projects have been prioritised for execution in FY2024.

Pipeline ID	Risk Rating	Location	Issue
400	High	Ohanga Road, Urenui	A large relic landslide feature above the pipeline, a water table drain runs to the right of the pipeline. Evidence of signs of slumping and/or erosion on the of the adjacent river. Risk ID 7586
400	High	Ahu Ahu Road, Oakura	Active land movement and water seepage adjacent to pipeline. Risk ID 7598
400	High	Feature No.4 Glen Murray Road, Glen Murray	Active landslide, with regression towards pipeline if left un-remediated. Risk ID 9215
400	High	Feature no.4, Pukearuhe	New land movement adjacent to pipeline easement. Risk ID 12767

7.1.2 505 Line Washout

The network optimisation and compression strategy considered the long-term needs of the network and through the process it was evident that making changes to the southern system in the short term would provide significant benefits:

- Reduced long term operational costs
- Increased security of supply
- Better reliability
- Reduced emissions.

The review highlighted that the existing compressors are poorly sized for the demand and the units are the least reliable in the fleet and increased operational costs to maintain the expected levels of service are being experienced.

In line with the Firstgas network optimisation and compression strategy, work has commenced with replacement of one of the units at Kaitoke compressor station. The scope is to replace unit 1 compressor, which is undersized for current and future duty with two 50% compressor packages to provide demand over the full range.

The expenditure in FY2023 is limited to design work and procurement of long lead items for the project. The bulk of the procurement and construction is anticipated to be completed in FY2024 and FY2025.

The compressors are currently planned to arrive on site during the third quarter 2024.

More information on the compression strategy is available in *Appendix C – Network Overview*.

7.1.3 SCADA Replacement

Independent support from SCADA specialist consultants was sought to scope the project and assist with technology requirements, and to define Firstgas' needs, based on the newer technologies that are available. The advice from the consultants has been followed and eight specialist vendors have provided detailed proposals for the system replacement.

The evaluation process clearly placed Emerson in the preferred vendor position, due to their strong local support network presence being one of the key factors and Firstgas engaged in direct negotiation with Emerson to finalise the scope of works, delivery and pricing for the project.

The Emerson scope of works included the supply and install of DeltaV hardware and software, cybersecurity hardware, software and licenses, project execution services (engineering and commissioning) and the lifecycle services costs.

The detailed design up to the Factory Acceptance Testing is planned throughout 2023 to Q1 2024. The site execution will be stretched through Q2 and Q3 2024 with commissioning planned Q4 2024.

7.1.4 Upgrades To The Pigging Facilities Programme

Firstgas has a programme in place to increase the number of pipelines that can utilise inline inspections as a condition monitoring tool. To enable this to occur either tool launching and receiving facilities will need to be modified, or pipelines modified to enable the tool to run. The following locations are planned to be upgraded to enable the running of inline tools.

Pipeline	Actions
504	Review pipeline layout and determine acceptability for pigging. Function and performance check of isolation valves. Conduct cleaning pigging programme
702	Convert pipeline to be piggable
434	Modifications to pipe spools at launchers and receiver, and installation of launcher and receiver. Conduct cleaning pigging prior to completing intelligent pigging
421	Review pipeline configuration and suitability for pigging. Installation of launchers and receivers. Conduction cleaning pigging prior to undertaking intelligent pigging

7.1.5 Intelligent Pigging

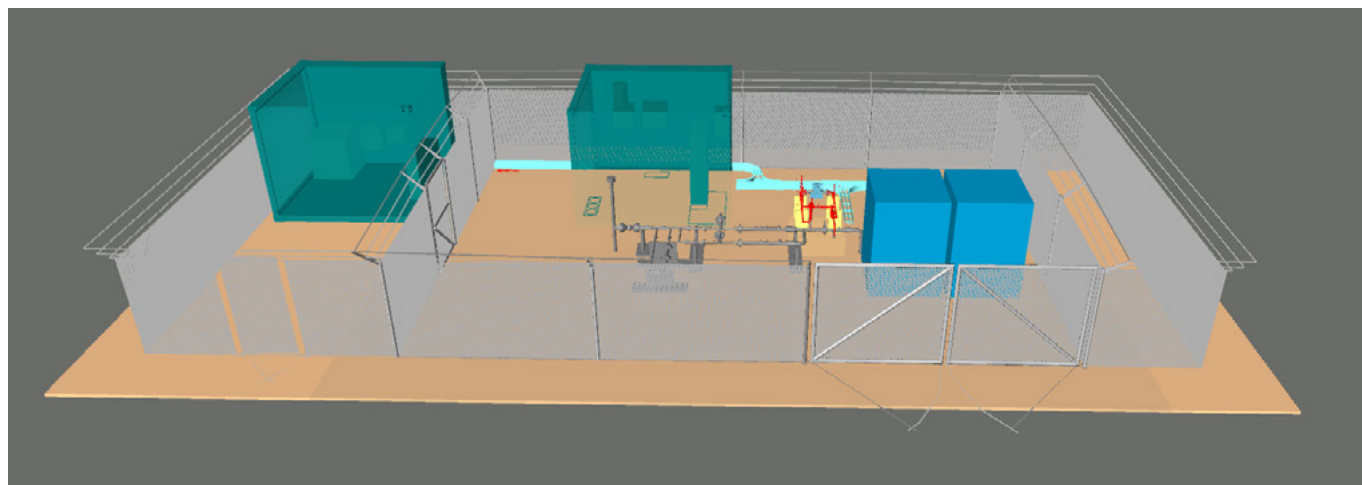
The frequency of the intelligent pigging programme is driven by the Pipeline Integrity Management Plan. Typically for pipelines that transit urban area or located in areas that pose an increased risk, the intelligent pigging will be conducted at five yearly intervals. For pipelines that transit rural areas or are not exposed to elevated risk potential, the pigging is conducted at ten yearly intervals.

Through the course of FY2024, it is planned to conduct intelligent pigging on the following pipelines.

Pipeline	Actions
702	Foley Road offtake to Pahiatua delivery point
435	Maungatapere main line valve to Kauri delivery point
421	Pirongia Offtake to Te Awamutu North delivery point
111	Waitangirua DP to TAWA A delivery point
600 series loop lines	Hawera to Kaitoke compressor station. This is broken up into four sections that will be pigged independently

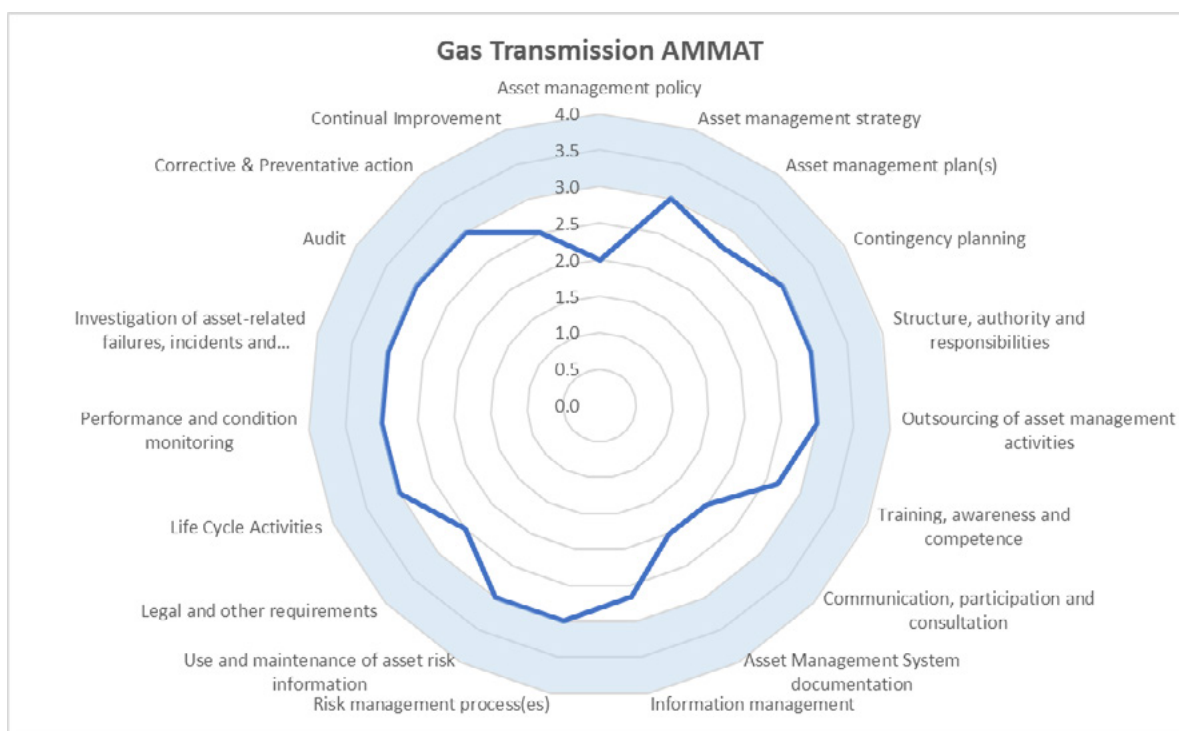
7.1.6 Hydrogen Trial

As detailed in section 5.3 Firstgas has been planning for the introduction with a blend of a small amount of Hydrogen into its network. Works to date have been in the preparation and design of the facility to enable hydrogen to be injected. The project is planned to move into the execution phase in FY2024.



7.1.7 Asset Condition (Schedule 12a)

Schedule 12a (report on asset condition), provides a high-level overview of the asset condition rating as per the Commerce Commission's grading categories¹³. Firstgas asset management strategies and expenditure are targeted to addressing instances where the condition rating is falling below the required standard. Assessing asset condition is a dynamic process and gradings will change as the assets age or as specific issues are identified.



Further detail on the condition, risks and issues, and planned activities can be found in *Appendix C - Network Overview*.

¹³ When Firstgas assesses asset condition a number of factors are considered. This includes, but is not limited to, criticality, risk and the condition monitoring strategy for that asset or fleet. This information informs replacement and refurbishment programmes. This means there is not an exact relationship between the Firstgas view of asset condition and the Commerce Commission's grading categories which results in some variations between grading and replacement strategies

8. Expenditure Forecasts



8. Expenditure Forecasts

Short-term cost increases have been observed over the past two years, with inflation exceeding the CPI forecasts. This has led to significant cost escalation throughout the entire supply chain for planned maintenance and capital expenditure. Several factors have contributed to these increases, including supply and demand imbalances, production downturns, fuel price hikes, container shortages and port congestion.

Firstgas will not compromise on safety and the impacts of the cost increases has resulted in the need to consider alternative strategies when planning to invest in the network.

Consideration may be given to smaller multiple investments over several years rather than single investments to manage the risk appropriately. This will enable us to better manage the cost escalations whilst managing risk appropriately. Alternately Opex funds may be utilised to provide short term monitoring or corrective solutions in the interim whilst the work can be planned for later in the planning period.

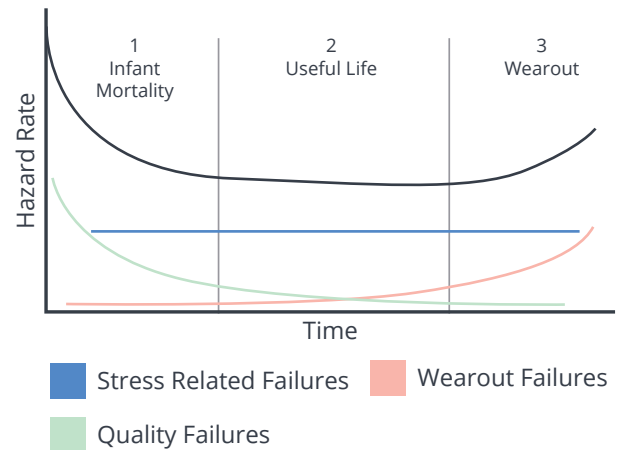
For example, if a pipeline realignment was previously considered, due to river erosion, a short-term mitigation measure could involve installing better protection and stabilisation of the riverbank, understanding that this may need to be repeated multiple times during the asset's remaining life.

Another example is the compression strategy, where investments are made to replace units at Kaitoke to match compression with demand in the southern leg of the system and improve the reliability of aging assets at the Kapuni Gas Treatment Plant. Once the Kaitoke project is completed, future network compression optimisation will be reassessed and re-evaluated to determine if further investment will be justified.

Regarding long-term investment needs, the Gas IM amendment and the shortened asset lives in the DPP3 outcome provided a solution to mitigate economic network stranding risks. However, there is still a need to invest in the remaining life of the assets. Although forecast demand is expected to decrease as New Zealand transitions to net zero carbon, the investment requirement on the network will not directly correlate with demand. Geohazards, for example, will continue to pose a risk to the transmission network throughout the asset's remaining life, necessitating on-going investment to manage the risk appropriately.

Aging assets require investment to maintain them at an appropriate level for expected service levels. As demonstrated by the typical bathtub curve (figure xx below), as the assets age, there can be an increase in the failure rate, to mitigate this risk, increased levels of capital investment or operational expenditure is required.

Asset Management Bathtub failure probability curve



While technology and alternative methods can help manage risk and monitor issues to some extent, there will come a point where asset replacement becomes the most effective solution. In the case of linear assets like pipelines, wholesale replacement is usually not feasible due to cost constraints and instead, affected sections are typically replaced. For example, replacing pipeline sections where the coating has deteriorated. The cost of recoating the pipeline section can be comparable to constructing a new section of pipeline.

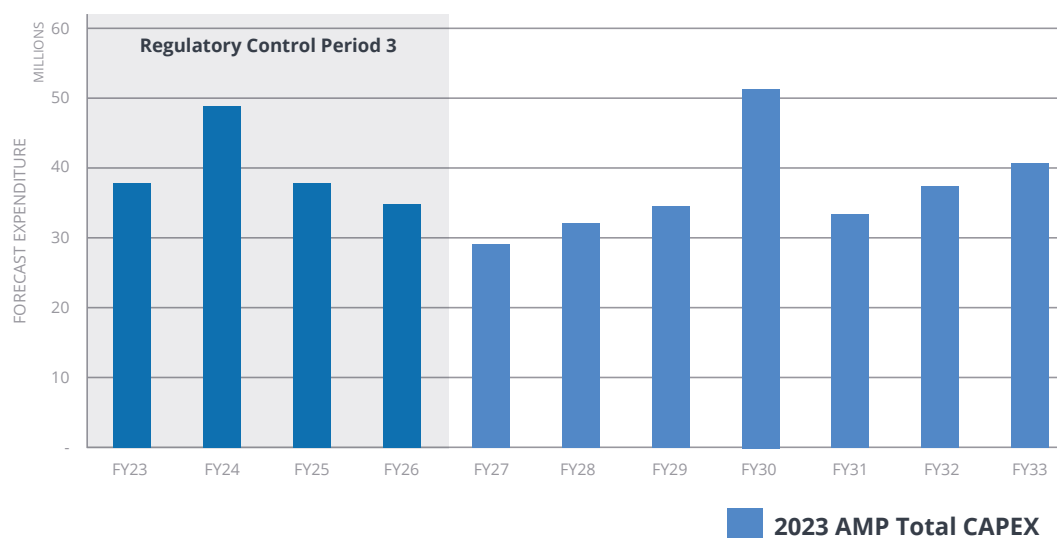
For compressors, once major components are overhauled, the life is reset. Factors such as, the types and frequencies of breakdowns, limited availability of parts for older machines and the cost-effectiveness of on-going up-keep are considered as part of the assessment for replacement of the asset.

Taking the opportunity to replace aging assets brings the additional benefits of installing more efficient or better performing assets, reduces Opex costs and delivers more reliable assets for the remainder of the networks life.

8.1 CAPEX Forecast

The Firstgas Capex forecast spend over the next ten years is set out in Figure 15.

Fig 15: Forecast total Capex (all figures in FY2023 prices)

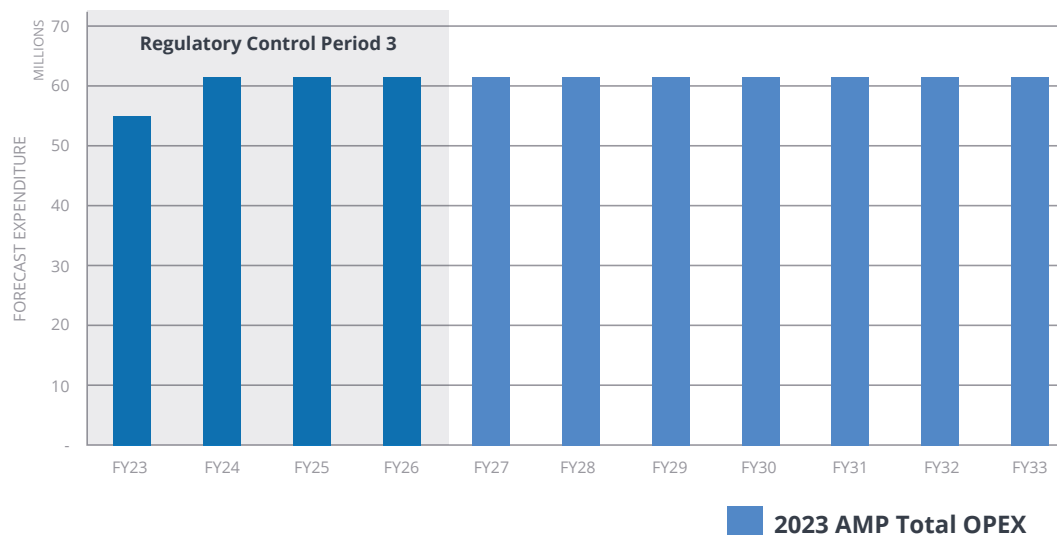


The increased level of Capex investment planned for FY2024 can be attributed to:

- The implementation of the Kaitoke Compression Upgrade works (\$18 Million).
- The implementation of the SCADA Replacement Project (\$3.5 million)
- Expenditure in FY2030 relates to construction of a new corporate building in New Plymouth.

8.2 OPEX Forecast

Fig 16: Forecast total Opex (all figures in FY2023 prices)



Firstgas is currently experiencing increases in costs across the supply chain. Opex forecasts have been developed based on the planned expenditure across the planning period.

The step change in expenditure between FY2023 and FY2024 is predominantly driven by compressor fuel costs and the forecast represents what expenditure may be required for on-going fuel costs.

9. Stakeholder Engagement

Firstgas recognises the importance of regular engagement with major gas users, customers and the communities who rely on the consistent and safe delivery of large volumes of gas to maintain their on-going productivity and business. Throughout the year, a focus on maintaining regular dialogue with stakeholders provided timely feedback, to improve the transmission services across the system.



Community Engagement

Firstgas Group recently had the privilege of accepting an invitation from Ngāti Tama to visit Pukearuhe Marae in Taranaki. Ngāti Tama are one of the eight iwi of Taranaki and are the kaitiaki (guardians) of the whenua (land) between Wai-iti through to Mokau river. The relationship between Ngāti Tama and Firstgas is important as two major pipelines run through their whenua.

The visit commenced with a welcome and pōwhiri from Ngāti Tama onto the marae with Firstgas Group's staff leading the karanga (call). Greetings, waiata and kai, were shared before hearing stories about the partnership journey Firstgas Group and Ngāti Tama are on.





9.1 Engaging with the Gas Industry

Engaging with all stakeholders and customers is a crucial aspect of the yearly business plan. Throughout the year, the following actions have been taken:

- Distributed regular updates to stakeholders, providing them with information and updates on significant transmission topics.
- Continued participation in meetings of the Major Gas Users Group (MGUG) to share detailed operational plans and gather feedback. These meetings also served as a platform to discuss common areas of interest and address issues facing the gas sector, such as the ERP and the development of a Gas Transition Plan.
- Continued with the collaboration with Vector and Powerco as part of the Gas Infrastructure Futures Working Group, which aims to approach the challenges of the energy transition collectively. The group has conducted thorough analyses of the gas infrastructure sector, providing valuable insights for the government's response to climate change.
- Maintained regular meetings with gas producers to address relevant matters and explore opportunities for enhancing gas quality and compliance with specifications.
- Continued engagement with EmsTradepoint, the wholesale gas market operator, by actively participating in their operations working group. This involvement helps gain a better understanding of how gas trading impacts the competitiveness of the New Zealand gas market.
- Solicited feedback from shippers on provisional prices for FY2023.
- Actively participated in monthly meetings with the Critical Contingency Operator (CCO) to discuss pertinent issues and ensure preparedness for potential critical contingency events.
- Provided input as the Transmission System Owner (TSO) during the CCO's annual training sessions, which were attended by shippers, large consumers, retailers, producers, and gas distribution companies.
- Worked closely with Gas NZ to develop and promote the future of renewable gas together and sought their advice and support on industry wide issues. Collaborated with other New Zealand energy companies to establish Powering Change, a joint commitment to a more sustainable future for Aotearoa New Zealand.
- Collaborated with Gas NZ, Powerco and Rennai on the gas industry wide Future Sure campaign to promote the future of renewable gas to the New Zealand public.

9.2 Land and Planning Stakeholder Management

The Firstgas land and planning team's stakeholder management, is focusing on building and sustaining relationships, and where appropriate, partnerships with landowners, iwi, councils, developers, contractors, and other interested parties, for the protection of the transmission pipeline and the community. To manage this, a stakeholder management plan has been developed that sets out goals, objectives and actions that guides the direction for stakeholder relations. Progress has been made on these actions and include many current initiatives such as:

- Shaping national policy, regional and district council plans that influence and affect the operation of Firstgas assets, through active engagement in plan changes and reviews, taking part in a national planning standard working group alongside other utility providers and submitting on local and central government policies and standards.
- Updating and reviewing current communication channels, updating the Firstgas website information, and developing more information aids such as pipeline safety videos, emails and booklets, and contractor presentations. Going forward, new marketing techniques will be investigated that will enable better engagement with contractors and landowners through different marketing channels including text messaging and email.
- Interacting more with the field operations teams, to ensure continuous improvement on how Firstgas operates so that customers are receiving the best level of service.
- Providing clarity and documented standards around pipeline easement management. The unauthorised activity management process and the time and quality of responses is also being improved.
- Providing information on regulatory requirements under the RMA and subsidiary legislation and plans. Early involvement in projects allows for design of works to reduce adverse environmental and social effects where possible.
- Advising and reporting to relevant stakeholders as required under existing resource consents and associated legislation.
- Embedding and developing a new land data management system that helps manage and record all interactions with stakeholders and provides information access in the field.



9.3 Managing Conflicting Interest

In the operation of any large organisation with numerous stakeholders and diverse interests, situations will inevitably arise where not all interests can be accommodated, or where conflicting interests exist. For example, different customers may place greater or lesser emphasis on price or quality.

From a Firstgas perspective, situations of conflicting interests are best managed by:

- Clearly identifying and analysing stakeholder conflicts (existing or potential).
- Having a clear set of fundamental principles that help to guide a resolution. Firstgas is legally bound to make decisions that are consistent with the transmission operating codes (which include obligations relating to confidentiality) and must comply with the Health and Safety in Employment (Pipelines) Regulations 1999 and other relevant legislation.
- Seeking solutions that are consistent with the principles found in the codes and in relevant legislation or regulation.
- Communicating effectively with stakeholders so that all parties know where they stand.

In all instances of conflicting interests, Firstgas will strive to engage with stakeholders in a transparent manner and clarify any decisions.

