Firstgas

GAS DISTRIBUTION BUSINESS

Asset Management Plan Update

Year commencing 1 October 2021

First Gas Limited
September 2021

Disclaimer: The information in this document has been prepared in good faith and represents Firstgas' intentions and opinions at the date of issue. However, Firstgas operates in a dynamic environment (for example, the changing requirements of customers, deteriorating asset condition and the impact of severe weather events) and plans are constantly evolving to reflect the most current information and circumstances.

Importantly, we note that how the Government choses to adopt and implement the Climate Change Commission's final recommendations on natural gas and gas infrastructure may have a material effect on our asset management strategy and the underlying assumptions we have applied to develop our AMP Update forecasts. Consequently, Firstgas does not give any express or implied assurance about the accuracy of the information or whether Firstgas will fully implement the plan or undertake the work mentioned in the 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 THE CHIEF EXECUTIVE OFFICER

Tēnā koutou katoa and welcome to First Gas Limited's Gas Distribution Asset Management Plan Update (AMP Update) for 2021.

This year has seen a rapidly evolving energy market, primarily driven by a legislative target of net zero emissions by 2050 and the release of the Climate Change Commission's final recommendations to Government. Together these represent a significant challenge to Firstgas and present new opportunities.

Firstgas is committed to helping New Zealand reach its target of net zero emissions by 2050 and we believe that gas has a big part to play in New Zealand's energy future. To achieve this target, while keeping energy prices affordable, we support an approach that involves the decarbonisation of multiple energy distribution channels, including gas networks.

For over two years, Firstgas has had a dedicated workstream investigating net zero carbon gases, such as hydrogen, biomethane, and bioLPG. In March 2021, we released our Hydrogen Feasibility Study. This research shows that we can introduce hydrogen into the Firstgas pipeline network from 2030 and convert to 100% hydrogen by 2050. This step would reduce New Zealand's energy emissions by nearly 25%. In June 2021, we released a joint Biogas study with Beca, Fonterra and EECA that revealed that biomethane is a viable, untapped solution to decarbonising New Zealand's natural gas network right now, with the potential to replace nearly 20% of New Zealand's total gas usage by 2050. Developing these technologies will help us provide low emissions options for our customers in the future, while retaining the benefits of gas provided via our existing pipeline networks.

Over the past year, we have continued our focus on improving the performance of our distribution network and managing risk, while also enabling system growth and increasing the number of customers connecting to our network. Kiwis value the option of having gas in their homes and over the last 12 months, we have connected a record number of new residential and commercial gas customers. Firstgas has completed seven projects, replacing approximately 2.5 kilometres of pre-1985 polyethylene (PE) pipeline on our network, addressing the risk of pipe failure and potential gas leaks. We have also completed over 80 projects that extend our existing network to enable future gas connections, predominantly in the greater Waikato region as well as Taupo, Tauranga and the Kapiti Coast. The roll out of our Maximo Asset Health Insights (MAHI) application this year has been successful and allows us to better link asset health to risks and improve our asset management planning process.

Looking ahead, we are focused on ensuring gas remains a competitive fuel choice for our customers while operating within the regulated price-quality framework set by the Commerce Commission. We will continue to provide sufficient incentives to invest to maintain reliable gas infrastructure as well as start to develop our network to be able to service the future demand for net zero carbon gases. We feel that it is in everyone's' interests to use the 2022 – 2027 regulatory control period to start these activities. This will help us maintain stable prices and retain the quality and reliability of our distribution service.

It is important for our business to remain proactive and ready to adapt to change. Our customers come first, and we work as one dedicated team to create an industry leading operation. Integrity and respect are integral to our business, and we empower our team to do their jobs safely. Firstgas is proudly connecting with kiwis every day to make sure their energy needs are met right now, and in the future. Investigating innovative technology is part of New Zealand's journey to cutting emissions but we need the sustainability, reliability, and affordability of gas to help get us there.

I hope you find the 2021 AMP Update for our gas distribution business both interesting and informative. We look forward to working with you in the coming year and welcome feedback on this year's AMP Update.

Ngā mihi nui

Paul Goodeve
Chief Executive

GLOSSARY

TERM	DEFINITION
AMMAT	Asset Management Maturity Assessment Tool. Results of the AMMAT are published in a full AMP. Any material changes to the asset management maturity rating results between AMPs are published in the AMP update
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
BAU	Business as usual
Capex	Capital expenditure – the expenditure used to create new or upgrade physical assets in the network and non-network assets
CCC	Climate Change Commission
COO	Chief Operating Officer
Data accuracy	**Grade 1:** means that good quality data is not available for any of the assets in the category and estimates are likely to contain significant error **Grade 2:** means that good quality data is available for some assets but not for others and the data provided includes estimates of uncounted assets within the category **Grade 3:** means that data is available for all assets but includes a level of estimation where there is understood to be some poor quality data for some of the assets within the category **Grade 4:** means that good quality data is available for all so the assets in the category
DPP	Default Price – Quality Path
DRS	District Regulating Station
FSP	Field Service Provider
FY2021	Financial year ending 30 September 2021
GDB	Gas Distribution Business
GPB	Gas Pipeline Business
GTB	Gas Transmission Business
GIS	Geographical Information System
GMS	Gas Measurement System – commonly referred to as a gas meter

TERM	DEFINITION
HSEQ	Health, Safety, Environment and Quality
ICP	Installation Control Point – the connection point from a customer to the Firstgas network
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*
Inherent Risk	Inherent Risk Risk identified without risk controls
IP	Intermediate pressure
IT	Information Technology
kPa	Kilo-Pascal, a unit of pressure
KPI	Key Performance Indicators
MAHI	Maximo Asset Health Insights
MP	Medium pressure
NB	Nominal Bore of the pipe
NZTA	New Zealand Transport Agency
NZUAG	New Zealand Utilities Access Group
Opex	Operational Expenditure – the ongoing costs directly associated with running the gas distribution 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)
PE	Polyethylene
PJ	Petajoule (unit of energy). 10^15 joules = 1,000 TJ
Planning period	A projected period of 10 years commencing with the disclosure year following the date on which the AMP is disclosed
Regulatory control period (RCP)	Means the regulatory period for default / customised price-quality regulation applicable to a GDB as specified in a determination made under a S52P of the *Commerce Act 1986*.
Residual Risk	Risk remaining after risk treatment activities are implemented
RCMI	Routine and Corrective Maintenance and Inspection
RTE	Response time to emergencies
scm/h	Standard cubic meters per hour (unit of gas flow rate)

EXECUTIVE SUMMARY

This is First Gas Limited's (Firstgas) Gas Distribution Asset Management Plan Update (AMP Update) for 2021.

Firstgas owns and operates more than 4,900 kilometres of gas distribution pipelines that service approximately 66,000 consumers across the regions of Northland, Waikato, Central Plateau, Bay of Plenty, Gisborne and Kapiti Coast. Firstgas also owns and operates 2,500 kilometres of gas transmission pipelines. These pipelines transport around 20 percent of New Zealand's primary energy supply from Taranaki across the North Island.

Firstgas is part of the wider Firstgas Group. Headquartered in New Plymouth, Firstgas Group is an umbrella brand consisting of Rockgas, Firstgas, Flexgas and Gas Services NZ. Firstgas and Rockgas are consumer brands that supply LPG and natural gas to over 165,000 customers through their gas network of high-pressure transmission pipeline and distribution pipeline in the North Island, 36 local LPG suppliers, and over 180 Refill & Save locations across New Zealand.

Flexgas and Gas Services NZ are energy storage, operations and maintenance brands who make sure gas can be delivered safely and continuously. Flexgas operates the Ahuroa gas storage facility in central Taranaki. Gas Services NZ provides operational and maintenance support to all gas infrastructure owners, including other parts of Firstgas Group.

Activities across the Firstgas Group are driven by our vision and mission:

Vision	Proudly leading the delivery of New Zealand's energy needs in a changing world.
Mission	Safely and reliably delivering energy that is affordable and acceptable to New Zealand's families and businesses

For our gas distribution business, this means that we are focused on distributing gas across our networks to meet the diverse needs of our customers, be it industrial processes, commercial businesses, or residential customers using gas for their space heating, water heating and cooking needs. We are focused on ensuring gas is a competitive fuel choice for our customers, while operating within the regulated price-quality framework set by the Commerce Commission and starting to develop our network to be able to service the future demand for net zero carbon gases by 2050.

KEY DRIVERS FOR OUR DISTRIBUTION BUSINESS

Our AMP Update describes the asset management processes that we use to manage our gas distribution network and its assets. It focuses on how we intend to manage these assets over the next 10 years (the planning period) with a focus on:

- A commitment to safety, for our staff, customers and the general public
- Being accountable for the performance of our gas distribution network
- Providing visibility of our investment in the network and upcoming physical works
- Ensuring ongoing engagement with our stakeholders, staff and contractors
- Compliance with our regulatory obligations.
- Preparing the business for future challenges and opportunities. We will invest where it is economic, given the expected decline in natural gas demand, while ensuring we have the capacity to support the deployment of net zero carbon gases.

For a complete understanding of the basis for our asset management decisions over the planning period, we recommend that this AMP Update be read in conjunction with our 2020 AMP.

Our approach to asset management is guided by an asset management framework that provides a clear "line of sight" from Firstgas Group's direction and goals, down to our company objectives and day to day activities. This framework guides the optimal combination of life cycle activities to be applied across our distribution assets, based on their criticality, condition and performance.

There are a number of key drivers that influence our approach to asset management for our gas distribution business over the planning period. Firstgas is focused on:

- **Continued performance improvements:** We are focused on the efficiency of how we physically operate our distribution system, as well as the efficiency of our broader business activities. The District Regulating Stations (DRS) upgrade and replacement projects will continue each year as we identify poor performance and obsolete parts that are not compliant to Firstgas' standards. Upgrades to DRS are essential to ensure that an adequate supply of pressure across our distribution networks is maintained, to meet both present and future customer needs.

  Our asset management improvement programme continues to build on the work we completed in FY2021. The delivery of our Maximo Asset Health Insights (MAHI) application will provide us with a powerful tool to assisting in our lifecycle planning, enabling us to focus our effort on the areas that needs improvement.
- **A strong culture around health and safety:** Safety is at the forefront of how we approach managing and operating our distribution assets. Maintaining product containment is the primary control that minimises risk to all those who live and work on and around the distribution network.

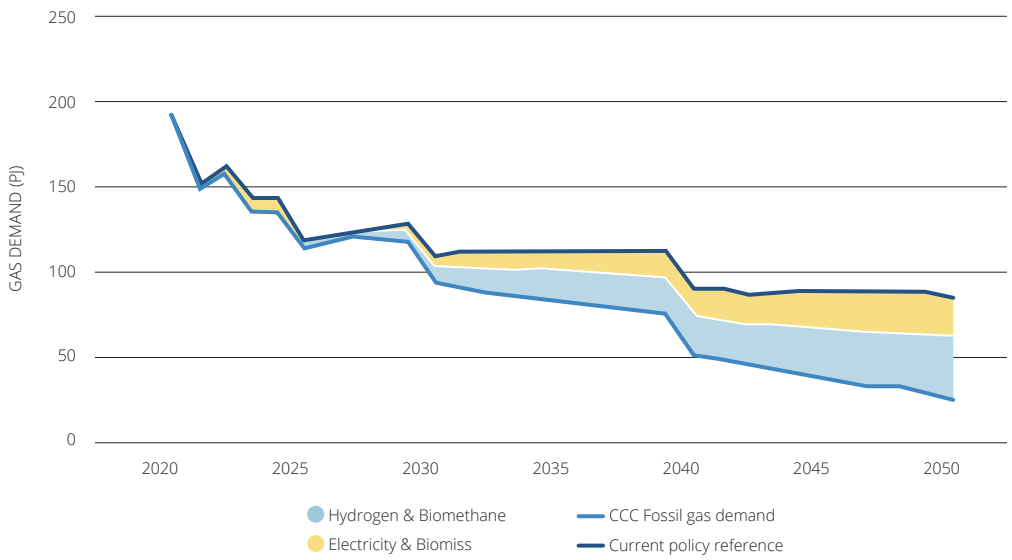
  Asset integrity and our asset management practices outlined in this AMP Update are crucial in maintaining safe outcomes.
- **Mitigating and managing risk:** The consideration of risk plays a key role in our asset management decisions. In 2019, the Commerce Commission engaged AECOM to review our risk management practices. This year we requested that AECOM return to review our progress since the 2019 report. We are very pleased with the outcome of AECOM's 2021 report, that highlights our improvements and commitment to continuous improvement around managing risk.

– **Preparing the business for future challenges and opportunities.** We are in a rapidly evolving energy market, primarily driven by the government's legislative targets for net zero emissions by 2050 and the release of the Climate Change Commission's (CCC) final report to Government. Together, these events have the potential to have a significant impact on Firstgas, while also presenting opportunities. Firstgas is committed to being part of the transition to carbon neutral, as well as ensuring that gas has ongoing role in New Zealand's energy future. We believe that a more diverse energy portfolio will provide more resilience for our country, as well as be more affordable for all New Zealanders.

  Therefore, we are focused on ensuring we maintain our existing infrastructure to an appropriate standard to meet customer needs, while making economic investments aligned with the expected decline in natural gas. Figure 1 sets out the long-term forecast demand for gas, as modelled by the CCC.

  We are also developing our network to ensure it has the capacity to meet the future deployment of net zero carbon gases. Over the last two years, we have had a significant programme of work underway to investigate the potential for net zero carbon gases such as green hydrogen and biogas. Figure 1 highlights the proportion of gas demand that could be met by the introduction of green hydrogen and biomethane.

Figure 1: Net Zero Carbon Gases



ACTIVITIES PLANNED FOR THE COMING YEAR

The focus for the coming year (FY2022) remains on providing our customers with a safe and resilient gas distribution system.

Our forecast expenditure (Capex and Opex) over the next ten years is set out in the blue bars in Figure 2 and Figure 3, with the forecast from last year's AMP shown in the red line.

Figure 2 sets out our planned Capex for the planning period compared to the forecast Capex published in our 2020 AMP.

The uncertainty resulting from the CCC's final report to Government has prompted us to refine our mid to long term planning forecasts across the planning period. This has resulted in a reduction in the Capex over the next two regulatory control periods.

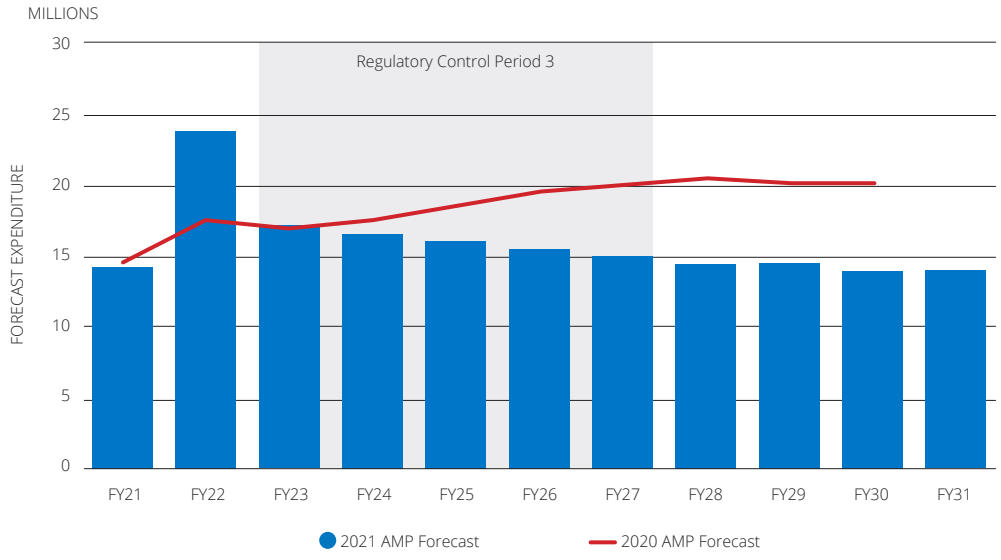
The changes within this regulatory control period (FY2017 – FY2022) relate to:

- An increase in consumer connection spend in FY2022 of approximately $6.7 million, which is attributable to two new industrial dairy plant customers.
- An increase in asset replacement and renewal expenditure in FY2022 of approximately $1 million to accelerate the replacement programme of pre-1985 polyethylene (PE) pipeline.

The changes within regulatory control periods three and four[1] (FY2022 – FY2031)

- An increase in asset replacement and renewal expenditure of approximately $10 million (total) over the next two regulatory control periods to continue to accelerate the replacement programme of pre-1985 polyethylene (PE) pipeline.
- A significant decrease in the total combined expenditure allocated for customer connections and system growth (approximately $40 million), due to a reduction in our connection forecast and subsequent lower growth demand forecast.

Figure 2: Forecast total Capex (all figures in FY2021 prices)



1. Regulatory control period four runs from FY28 through to FY32.

Figure 3: Forecast total Opex (all figures in FY2021 prices)

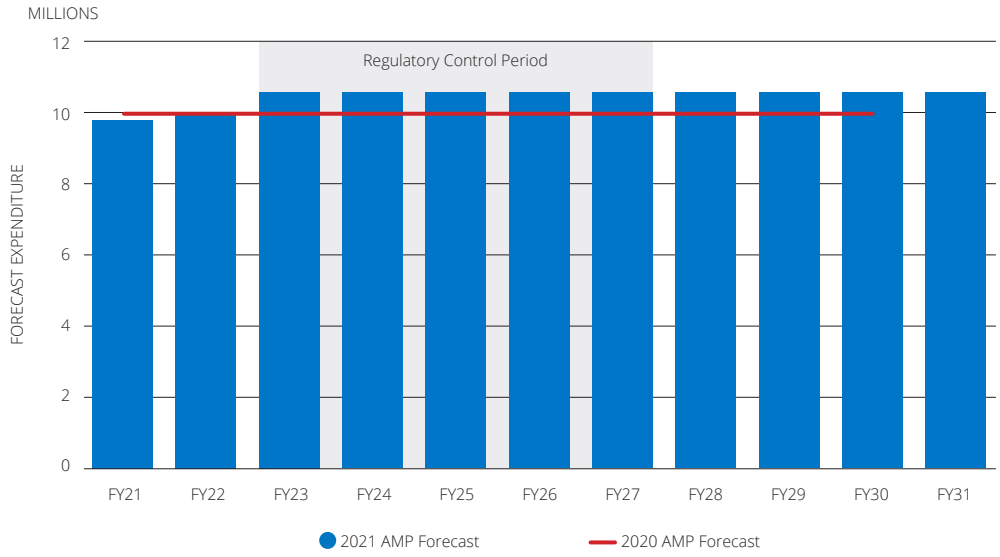


Figure 3 outlines our planned Opex for the planning period compared to the forecast Opex published in our 2020 AMP. There is no change within this regulatory control period (FY2017 – FY2022).

The changes within regulatory control periods three and four relate to an increase in network expenditure of approximately $5.4 million (total) over the next two regulatory control periods for our zero-carbon gas trial programme.

Risk and Performance of the Distribution System

Currently we have a stable risk profile with very little change through the planning period. In the long-term, we anticipate that there will be an increase in our risk profile driven primarily through ageing assets. Although our pre-1985 strategy plan is to replace mains pipes according to the risk ranking and this will ensure efficient spending to address the highest risk sections within the distribution network. The remainder of the pipeline assets will continue to age which may require additional investment to replace to maintain service levels. In the year in review section (figure 18), we have collated our asset classes health and risk data.

To ensure that existing reliability, safety and supply quality levels will be maintained and improved across our distribution network, Firstgas has established a series of Key Performance Indicators (KPI) that we regularly monitor and annually report against.

We are meeting Commerce Commission quality standards. The key areas that need improvement are the KPIs relating to poor pressure due to network causes and the target for leaks identified. Our KPIs are discussed further in section 5.4.

1. INTRODUCTION

This is the 2021 Asset Management Plan Update (AMP Update) for First Gas Limited's (Firstgas) gas distribution business.

Firstgas owns and operates more than 4,900 kilometres of gas distribution pipelines that service approximately 66,000 consumers across the regions of Northland, Waikato, Central Plateau, Bay of Plenty, Gisborne and Kapiti Coast. As the sole provider of gas distribution services to those locations, we are regulated under Part 4 of the *Commerce Act 1986* and subject to both price-quality path and information disclosure regulation. Producing an AMP or AMP Update each year is one of these regulatory requirements, as well as being a key document guiding the operations of our business and our engagement with customers and stakeholders.

This section outlines the purpose, scope and structure of our 2021 AMP Update and provides an overview of both our business and our gas distribution network. We also set out the key regulatory and environment changes that are influencing our gas distribution business.

1.1 PURPOSE OF THE AMP UPDATE

This AMP Update focuses on the material changes from the 2020 AMP that influence our planned expenditure and the growth of our gas distribution business. We also see this AMP Update as an important planning tool for our operational (Opex) and capital expenditure (Capex) over the next ten years (the planning period). While priorities may change over this time, we consider that it essential that we clearly outline our plans for the distribution network, while maintaining flexibility to adapt and respond to customer requests as the year progresses.

In addition, we are using this opportunity to update all our stakeholders and customers on our progress against the plans stated in the 2020 AMP, and to outline our focus areas for the year ahead. This document is one part of our ongoing engagement with our customers, and it provides an important way for our customers to evaluate the value being delivered by our capital programme.

1.2 ALIGNMENT WITH REGULATORY REQUIREMENTS

Our AMP Update aligns with regulatory requirements, as it:

1. Relates to the gas distribution services supplied by the GDB.
2. Identifies any material changes to the network development plans disclosed in the last AMP under clause 12 of Attachment A or in the last AMP Update disclosed under this clause.
3. Identifies any material changes to the lifecycle asset management (maintenance and renewal) plans disclosed in the last AMP pursuant to clause 13 of Attachment A or in the last AMP update disclosed under this clause.
4. Provides the reasons for any material changes to the previous disclosures in the Report on Forecast Capital Expenditure set out in Schedule 11a and Report on Forecast Operational Expenditure set out in Schedule 11b.
5. Identifies any changes to the asset management practice of the GDB that would affect a Schedule 13 Report on Asset Management Maturity disclosure.
6. Contains the information set out in the schedules described in clause 2.6.6 (Schedules 11a, 11b, 12a, 12b, and 12c).[2]

For a complete understanding of the basis for our asset management decisions over the planning period, we recommend that this AMP Update is read in conjunction with our 2020 AMP summary document and appendices which are available on our website **here**.

1.3 OBJECTIVES FOR OUR GAS DISTRIBUTION NETWORK

Throughout this AMP Update, we describe how we will achieve the following important objectives for our gas distribution network:

- **Safety commitment:** The safety of our customers, staff, service providers and the general public is paramount.
- **Engaged stakeholders:** Consult with our stakeholders, particularly on our planned investments, and consult on how we intend to manage the gas distribution network. This requires us to provide clear descriptions of our assets, key strategies and objectives.
- **Performance accountability:** Provide visibility to stakeholders on how we are performing and provide information on the performance of our network.
- **Investment planning:** Provide visibility of forecast 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 our asset management approach to staff and service providers to ensure a common understanding and suitable resourcing.
- **Regulatory compliance:** Ensure we meet our Information Disclosure obligations set by the Commerce Commission.

1.4 PERIOD COVERED BY THE AMP UPDATE

The AMP Update covers the ten-year period from 1 October 2021 through to 30 September 2031 (the planning period). This aligns with our 1 October to 30 September financial and pricing year. The expenditure forecasts presented in this AMP Update are expressed in constant 2021 prices (unless otherwise stated).

The 2021 Firstgas AMP Update was approved by our Board of Directors on 11 August 2021.

2. As set out in clause 2.6.5 of the *Gas Distribution Information Disclosure Determination 2012*, consolidating all amendments as of 3 April 2018, Commerce Commission

Firstgas Group

Our broader business

Firstgas also owns and operates 2,500 kilometres of gas transmission pipelines. These pipelines transport around 20 percent of New Zealand's primary energy supply from Taranaki across the North Island. Our gas transmission business is also regulated under Part 4 of the *Commerce Act 1986* and the 2020 AMP for our gas transmission business is available on our Firstgas website.[3]

Firstgas is part of the wider Firstgas Group. The Firstgas Group owns energy infrastructure assets across New Zealand through our affiliate Gas Services NZ Limited (GSNZ), a separate business with common shareholders that owns the Rockgas[4] and the Ahuroa gas storage facility. Rockgas has over 80 years' experience and provides LPG to 100,000 customers throughout New Zealand. It is New Zealand's largest LPG retail business and supplies its customers with both domestic and imported sources of LPG. The Ahuroa gas storage facility (trading as Flexgas[5] Limited) is New Zealand's only open access gas storage facility.

1.5 STRUCTURE OF THE AMP UPDATE

The structure of the AMP Update is based on the full AMP summary and is a standalone document that provides a high-level overview of the material changes from the 2020 AMP. It outlines what we have achieved over the past 12 months, and the key activities in the coming year. It also provides a summary of our forecast expenditure over the next ten years.

We have designed this document for those customers and stakeholders who want a concise overview of our Asset Management Plan for the planning period.

Table 1: Structure of our 2021 AMP Update and the relevant 2020 AMP appendices

AMP SUMMARY UPDATE	
A standalone document that provides an overview and summary of the activities we have undertaken over the past 12 months and includes any material changes to the 2020 AMP. The AMP Update incorporates – **Appendix A:** Summary of material changes and compliance – **Appendix B:** Information disclosure schedules – **Appendix C:** AMP 2021 Webinar – **Appendix D:** Director certificate	
RELEVANT 2020 AMP APPENDICES	
Standalone appendices in one consolidated document	
Appendix A	Glossary
Appendix C	Network overview
Appendix D	Network Maps
Appendix E	Asset Fleet
Appendix F	System development
Appendix G	Network Development Programme
Appendix H	Asset Management Approach

3. More information on our gas transmission business is available here: https://firstgas.co.nz/about-us/regulatory/transmission/
4. More information on Rockgas: https://rockgas.co.nz
5. More information on Flexgas Limited: https://flexgas.co.nz/

2. OVERVIEW OF FIRSTGAS

This section introduces our gas distribution business and provides:

- The corporate structure of Firstgas
- Organisational structure of Firstgas
- Maximising the benefits of gas
- An overview of our gas distribution network and assets
- Our approach to asset management and how we manage risk on our network
- The key regulatory and environmental factors influencing our business.

2.1 CORPORATE STRUCTURE OF FIRSTGAS

Firstgas is owned by funds associated with First Sentier Investors, part of the Mitsubishi UFJ Financial Group. 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.[6]

On 20 April 2016, Firstgas took control of Vector Limited's gas transmission assets along with Vector's gas distribution assets located outside of Auckland. In a separate transaction on 15 June 2016, Firstgas took ownership of Maui Development Limited's gas transmission assets (the Maui pipeline). The creation of Firstgas is the first time that gas transmission assets in New Zealand have had a common owner. We believe that common ownership is delivering three distinct advantages for gas industry participants and consumers:

- A strong commercial interest in maximising the competitiveness of gas.
- An opportunity to bring new capabilities to our team to drive growth in the use of the gas transmission system and gas distribution network.
- An ability to operate the gas transmission system and gas distribution network and manage our assets in ways that better serve the interests of our customers.

We remain focused on actively promoting the use of gas and ensuring work signalled in our AMP Update maximises the value obtained from our gas distribution system.

Firstgas Board

Firstgas 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 of our Board are available on our website **www.firstgas.co.nz**.

2.2 ORGANISATIONAL STRUCTURE

Firstgas employs approximately 222[7] staff. Most staff are based in our corporate headquarters in Bell Block, New Plymouth, with teams also located in Wellington, Tauranga, Palmerston North, Hamilton and Auckland. Our Executive team is headed by our Chief Executive Paul Goodeve, with eight direct reports.[8] Our organisational structure is illustrated in Figure 4 below.[9]

Delivery model for gas distribution

Field maintenance for our gas distribution business is outsourced to a field service provider (FSP), Electrix Limited. Electrix is responsible for the preventive, corrective and reactive maintenance works on the gas distribution network, and reports through to the Distribution Manager, who reports to the Chief Operating Officer (COO).

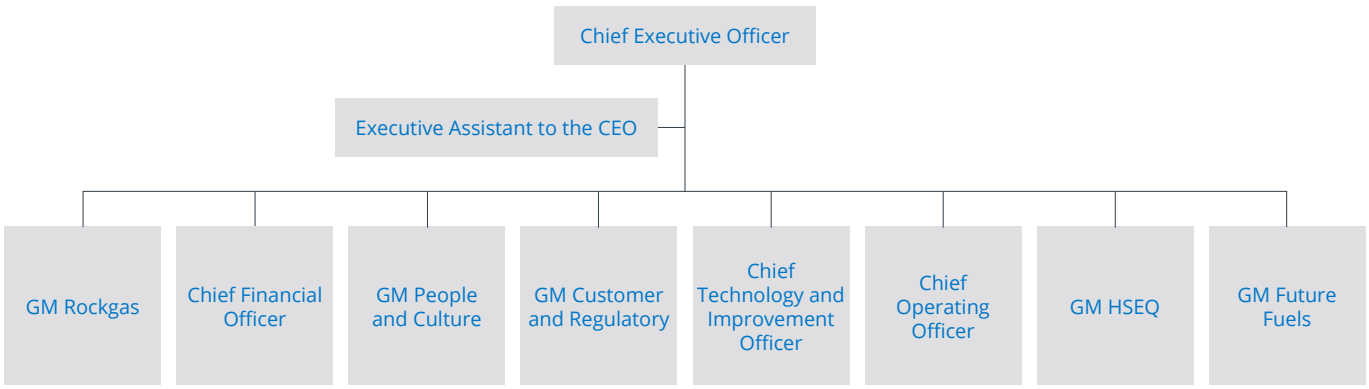
2.3 MAXIMISING THE BENEFITS OF GAS

Since the establishment of Firstgas, we have put significant effort into promoting the benefits of natural gas to our customers and making it an attractive fuel source.

We acknowledge that for many of our customers, gas is a fuel of choice. Unlike electricity, which is universal across New Zealand households and businesses, reticulated natural gas is often considered an option, rather than a necessity. This means we need to actively market natural gas to compete with other forms of energy available in New Zealand.

Our business' focus on gas directly influences our approach to asset management through our strong desire to investigate and convert growth opportunities across our gas distribution network, where economic. We believe that having more customers, with more diverse needs, makes our business

Figure 4: Organisation chart



6. More information on First Sentier Investors is available on their website: https://www.firstsentierinvestors.com.au/au/en/institutional/about-us/corporate-profile.html\
7. Excludes employees directly employed by Rockgas, but incorporates a number of business support staff that provide support across the Firstgas Group of businesses.
8. Biographies of our Executive Team are available on our website www.firstgas.co.nz.
9. Firstgas reviewed its organisation structure during July 2021.

more resilient in the near term and ultimately leads to more competitive prices for all customers accessing and using the distribution network.

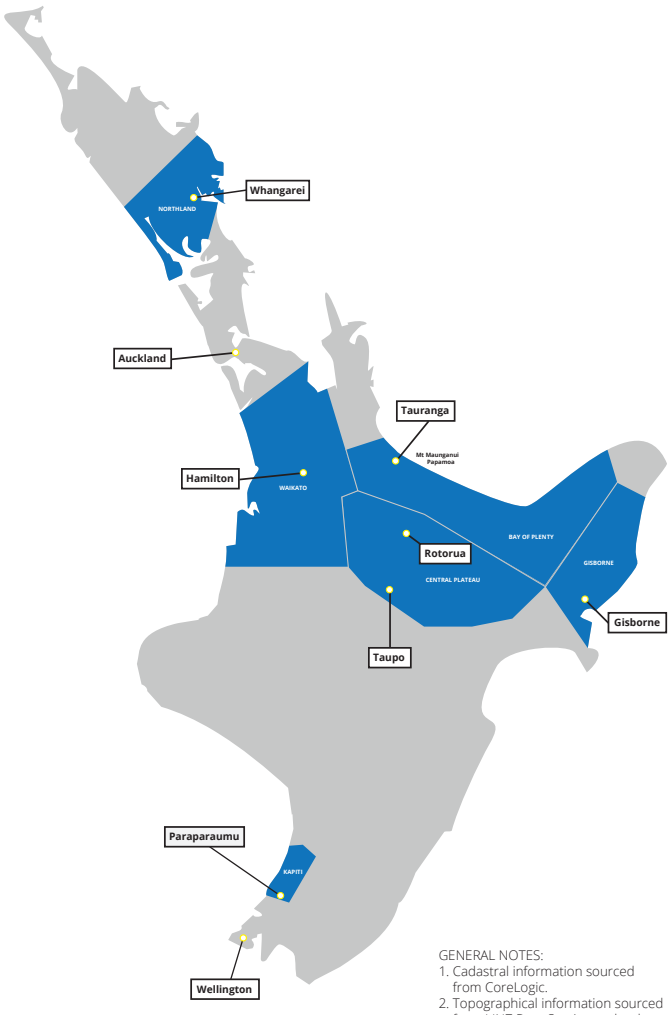
2.4 OUR GAS DISTRIBUTION NETWORK

The Firstgas distribution business incorporates gas distribution networks across Northland, Waikato, the Central Plateau, Bay of Plenty, Gisborne and Kapiti regions of the North Island, as highlighted in blue in Figure 5. We provide gas distribution services to retailers who sell gas to approximately 66,000 residential, commercial and industrial customers.

The key statistics for our gas distribution network, as at 1 June 2021, are set out in Table 2.

The reduction in the total number of district regulating stations (DRS) relates to a DRS in Rotorua being removed as there has been no consumers downstream of this DRS for more than 5 years. The increase in peak load relates to one of the large dairy factories running full load during the month of September 2020.

Figure 5: Our gas distribution areas



GENERAL NOTES:
1. Cadastral information sourced from CoreLogic.
2. Topographical information sourced from LINZ Data Service under the Creative Commons Attribution 3.0 New Zealand licence.

Table 2: Key gas distribution statistics as at 1 June 2021

STATISTIC	VALUE	CHANGE FROM 2020
Consumers connected	66,010	1%
System length (km)	4,901	1%
Consumer density (consumer/km)	13.5	0.3%
District regulating stations (DRS)	127	-1%
DRS density (system km/DRS)	38.6	2%
DRS utilisation (consumers/DRS)	520	2%
Peak loads (scm/h)	58,686	11%
Gas conveyed (PJ per annum)	9.4	1%

Asset categories

Gas distribution networks are made up of several distinct asset types. We use a number of categories to organise our asset base:

- **Distribution pipes:** This covers the network of pipes used to transport gas from the outlet valve of the gas transmission system and terminates at the inlet valve on a consumer's gas measurement system (GMS), or gas meter. Our pipes are constructed primarily from polyethylene (PE) and steel.
- **Pressure reducing stations:** Used to link two different pressure levels in the distribution network through pressure regulators. They are the points of input to a pressure level and are able to maintain a consistent inlet condition to that system.
- **Valves:** Used to isolate the flow of gas within the system when required or to vent gas in the event of an emergency.
- **Corrosion protection equipment:** Steel or metallic pipes and equipment installed in the gas distribution system (either above or below ground) are susceptible to corrosion. Various measures must be employed to ensure the integrity of the asset is maintained.
- **Monitoring systems:** At various strategic locations throughout our gas distribution network, monitoring systems are installed to observe and record network data.
- **Special crossings:** Special crossings are locations where a section of pipe is installed either above or below ground in order to cross over a roadway, river, railway or any area of interest with a differing risk profile from a standard installation.

Greater detail on our distribution assets is provided in the **2020 AMP** in **Appendix C**.

Pressures across the distribution system

Our gas distribution networks operate on a number of different pressure levels across the system. The standard pressure levels are set out in Table 3.

Table 3: Distribution Pressure Systems

PRESSURE LEVEL	RANGE
Intermediate Pressure 20 (IP20)	1,000-2,000 kPa
Intermediate Pressure 10 (IP10)	700-1,000 kPa
Medium Pressure 7 (MP7)	420-700 kPa
Intermediate Pressure 20 (IP20)	1,000-2,000 kPa
Medium Pressure 4 (MP4)	210-420 kPa
Medium Pressure 2 (MP2)	110-210 kPa
Medium Pressure 1 (MP1)	7-110 kPa
Low Pressure (LP)	2 -7 kPa

The intermediate pressure (IP) systems generally form the "backbone"' of the distribution networks with laterals diverging from pipes to supply adjacent areas. The IP systems are all constructed to a high technical standard from welded steel, and they are protected against corrosion by a combination of coating and Cathodic Protection systems.

The medium pressure (MP system) makes up the majority of our distribution assets. The pipes in the MP system generally form the greater mesh network and are used to directly supply gas consumers. The MP systems are constructed mostly of polyethylene (PE) pipe and as such require no corrosion protection.

Low pressure (LP) systems typically represent the oldest part of the distribution network, supplying residential and commercial loads. LP systems typically consist of polyethylene main pipes.

2.5 OUR ASSET MANAGEMENT APPROACH

Firstgas' approach to asset management is guided by a suite of asset management documents and practices that ensure we are meeting our performance objectives and the expectations of our stakeholders. Our approach incorporates:

- **Asset Management framework:** This framework describes our approach to ensuring alignment between our corporate objectives and our day-to-day asset management activities. It covers our strategic plan, which guides the subsequent development of our asset management system, asset management policy, objectives and ultimately this AMP Update (and full AMPs).
- **Asset Management system:** This system links our corporate objectives and stakeholder needs to specific asset management approaches through our asset management policy. We are working to align with the requirements of ISO 55001, the international standard for asset management, and seeks to reflect good practice.
- **Performance measures:** These documents set out the overall asset management performance objectives and the key performance indicators (KPIs) that Firstgas regularly monitor to ensure we provide a safe and reliable gas distribution network. Where appropriate, the targets have been developed to align with the definitions developed by the Commerce Commission for Information Disclosure.

Our AMPs and AMP Updates capture the key elements of this asset management document suite in a summarised form and explains our asset management strategy and approach to both internal and external stakeholders. Greater detail on our approach to asset management and KPIs is set out in our **2020 AMP** in **Appendix H**.

Addressing risks on our distribution system

Risk management is a key component of good asset management. The consideration of risk plays a key role in our asset management decisions – from network development planning, asset replacement decisions through to operational decisions. The assessment of risk and the effectiveness of options to minimise risk is one of the main factors in our investment choices.

Key risk and review elements for Firstgas include:

- **Risk management:** Our core processes are designed to manage existing risks, and to ensure emerging risks are identified, evaluated, and managed appropriately.
- **Contingency planning and response:** This work ensures we are prepared for and can respond quickly to a major incident that occurs or may occur on our gas distribution system.
- **Event management:** This provides clear definitions and guidance for all disciplines working for Firstgas to ensure a consistent approach in recognising and reporting events.

Given the potentially severe nature of failures in operation (particularly loss of containment), appropriate and effective risk management is integral to our day-to-day asset management approach. Our asset management information systems and our core processes are designed to manage existing risks, and to ensure emerging risks are identified, evaluated and managed appropriately.

Our approach is centred around:

- **Prioritising safety:** We prioritise those risks that may impact the safety of the public, our staff and service providers.
- **Ensuring security of supply:** Our works development and lifecycle management processes include formal evaluation of our assets against our security criteria.
- **Addressing poor condition / non-standard equipment:** Our lifecycle management processes seek out critical items of equipment that are at a higher risk of failure or are non-standard.
- **Formal risk review and sign-off:** Our processes include formal requirements to manage the risks identified, including mandatory treatment of high-risk items and formal management sign-off where acceptance of moderate risk is recommended.
- **Use of structured risk management:** We use structured risk capture and management processes to ensure key residual risks are visible and signed off at an appropriate level.

Gas industry codes require risk management to be a continuous process at all stages throughout the lifecycle of our gas distribution network. The nature of the gas distribution business is such that there are many inherent risks. In addition, safety management is one of our top operational priorities. The gas distribution business unit has a risk management system that is outlined in the *00083 Safety and Operating Plan*. This document outlines the minimum requirements and ensures consistency in risk management by our business.

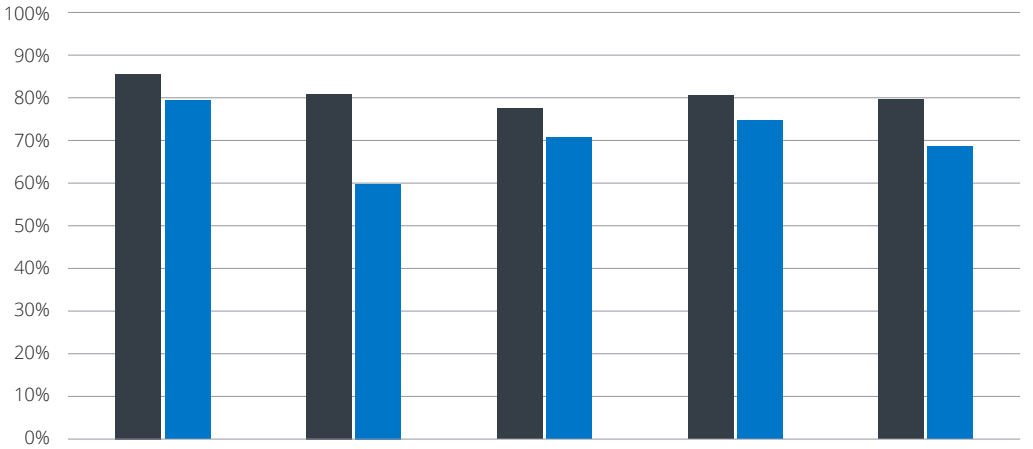
Greater detail on our approach to risk management is set out in our **2020 AMP** in **Appendix H**.

AECOM risk management practice review

In May 2019, the Commerce Commission engaged an external expert (AECOM[10]) to assess the risk management practices applied by gas pipeline businesses (GPBs) against an internationally recognised risk management framework.

Figure 6 shows the gap analysis summary from AECOM's 2019 report for Firstgas' distribution business, in terms of asset knowledge, strategic planning processes, asset management practices, information systems and organisational tactics. The report highlights key strengths with the businesses, as well as identifying gaps in the risk management practices. We have used the report to direct our asset management improvement initiatives over the course of the last 18 months.

Figure 6: 2019 Gap analysis for Firstgas distribution



	Asset Knowledge	Strategic Planning Processes	Asset Management Practices	Information Systems	Organisational Tactics
Best Appropriate	85%	80%	77%	80%	79%
Current	79%	59%	70%	74%	68%

10. The report is available through the Commerce Commission website https://comcom.govt.nz/regulated-industries/gas-pipelines/gas-pipelines-performance-and-data/summary-and-analysis-of-information-disclosed-by-gas-pipeline-businesses/risk-management-review-of-gas-pipeline-businesses?target=documents&root=176809.

In 2021, we engaged AECOM directly to review our progress since its 2019 report. They have identified several key areas where we have improved:

- Alignment of practices between our gas transmission and distribution businesses
- Increased stakeholder engagement
- Increased identification of risk events and velocity of risk resolution through our systems
- Development of formalised strategies to inform major activity classes with risk management an integral part of the strategies
- Capture of additional geospatial information within GIS and use of this to refine strategies and plans.

Based on the 2021 AECOM report, we are now achieving minimum best appropriate practice across all the assessment categories, and near or above best appropriate practice in the areas of asset knowledge and asset management practices.

We also took the opportunity to undertake a high-level review of our Asset Management Maturity assessment (AMMAT) against the outcomes of 2021 AECOM review. We believe that we have met and exceeded our AMMAT target score of 3. This will be formally reviewed as part of our next Full AMP publication.

We welcomed the 2021 AECOM review as it gave us an opportunity to demonstrate to an external party how we manage risk and the context of our business, and to also demonstrate the improvements we have made. The review has also informed us of the areas that we can continue to improve on.

2.6 OUR APPROACH TO HEALTH AND SAFETY

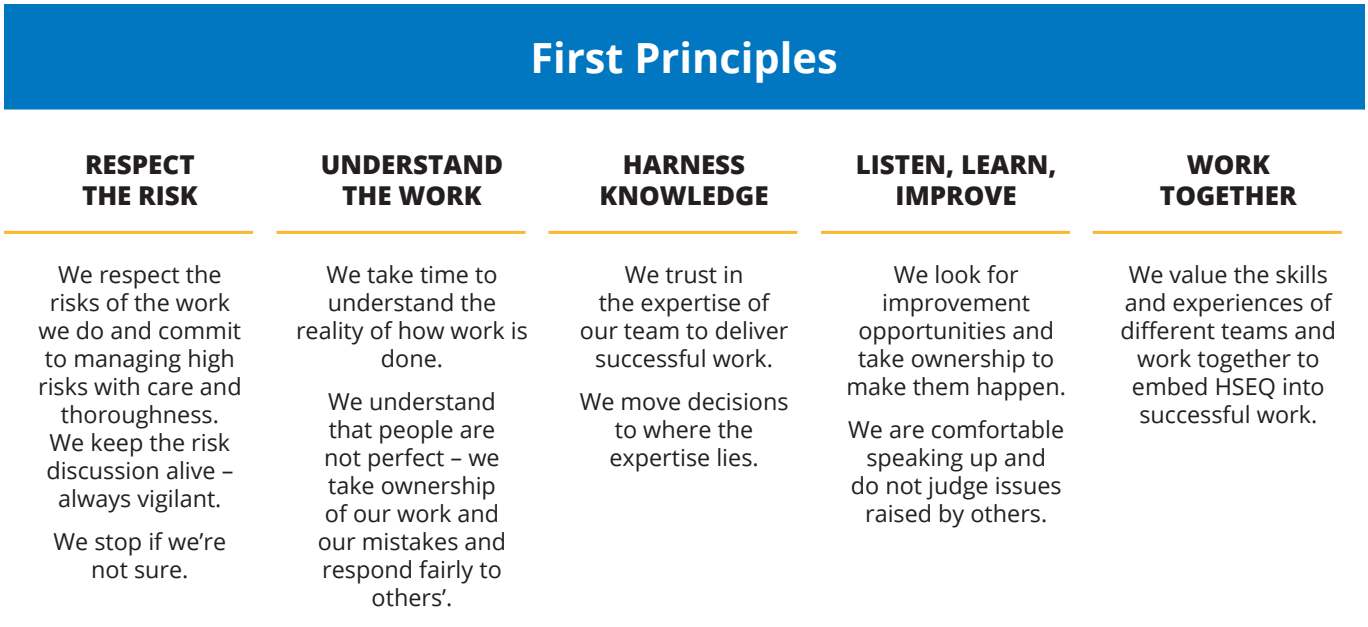
Safety is at the forefront of how we approach managing and operating our assets. There are hazards involved in the transmission and distribution of a flammable product such as natural gas. We take a systematic approach to ensure that the hazards and risk can be controlled and mitigated to an appropriate level. The asset integrity and our asset management practices outlined in this AMP Update illustrate how we mitigate risks and maintain safe outcomes. From maintaining containment of our product through to the Health and Safety leadership and accountability that underpins our culture.

Firstgas has a strong culture for ensuring safety. It is at the core of everything we do and extends beyond ensuring our people are safe in the field. Consideration of safety is at the forefront whether we are designing new assets, developing maintenance plans, executing work in the field, operating the network or having the appropriate emergency response plans.

Maintaining product containment is one of the primary controls that minimises risk to both workers and the public. Asset integrity and our asset management practices outlined in this AMP Update are, therefore, crucial in maintaining safe outcomes. Furthermore, strong asset integrity reduces the likelihood of emergency or reactive response that puts additional pressure on worker H&S.

Firstgas understands that one of the key factors in HS&E excellence is leadership and accountability. Leadership is required from all layers across the organisation, but the expectation and drive around leadership starts at the top. We have developed a set of First Principles that outline our approach to achieving healthy and safe work within Firstgas. The First Principles provide guidance on how we work rather than provide a prescriptive set of rules. Our First Principles are used as a basis for discussion when making decision about our work and ensuring that expectations are met.

Figure 7: Firstgas First Principles



2.7 CHANGES IN THE REGULATORY AND POLICY ENVIRONMENT

This year has seen a rapidly evolving energy market, primarily driven by the Government's legislative target of net zero carbon emissions by 2050, the release of the Climate Change Commission's (CCC) final recommendations to Government and a large suite of climate change policies and measures being drafted by government agencies. Together these factors represent a significant challenge to Firstgas, with an expected decline in natural gas over the long-term, as forecast by the CCC. However, the changes also present new opportunities for the business, with the possible deployment of net zero carbon gases such as green hydrogen and biogas.

This is occurring at a time when Firstgas is also approaching the next DPP reset for both our gas transmission and distribution business, where the Commerce Commission will set our price-quality path for 2022 – 2027. The Commission must also complete a review of the underlying Input Methodologies (IMs) for regulated energy businesses by December 2023. The outcome of these two regulatory workstreams will impact the forecast expenditure that we have set out in this AMP Update.

Swift Government action to address climate change

The Climate Change Commission (CCC) released its final advice in June 2021, setting out the first package of advice to Government on the actions it must take to reach 2050 target. This final advice was informed by extensive consultation with stakeholders and the public, with the CCC receiving over 15,000 submissions. A copy of Firstgas Group's submission to the CCC is available on our website **here**.

In its final report, the Commission has removed the proposed ban on new gas connections, and its initial recommendation to replace gas appliances with electric alternative. We strongly opposed these measures in the CCC's initial report as we believe that the CCC should look to rule options in, rather than out with seeking to reduce emissions. The CCC's final report now focuses on determining how to best eliminate fossil gas use in residential, commercial, and public buildings, proposing action such as:

- Setting a date to end the expansion of pipeline connections to safeguard consumers from the costs of locking in new fossil gas infrastructure
- Evaluating the role of low-emission gases as an alternative use of pipeline infrastructure
- Determining how to transition existing fossil gas users to low emissions alternatives.

The final report recommends Government sets a target for 50% of all energy consumed comes from renewable sources by the end of 2035; supports the development of bioenergy and hydrogen; and evaluates the role of biogas and hydrogen as an alternative use of pipeline infrastructure.

Firstgas commended the CCC for retaining energy options in its final advice to government and acknowledging the important role of net zero carbon gas may have in reducing New Zealand's carbon emissions by 2050. We also support the CCC's recommendation that Government commits to delivering a national energy strategy to decarbonise the system in collaboration with energy-system stakeholders. The Government now has until the end of this year to respond to the CCC report and set the first three emissions budgets for New Zealand.

Firstgas is already seeing the release of several Government consultation documents on areas that directly impact on our businesses and the likely future demand for natural gas. For example:

- The Ministry for the Environment (MfE) has consulted on phasing out fossil fuels in process heat by using National Environmental Standards (NES) or National Policy Statements (NPS) under the *Resource Management Act 1991*.[11]
- MfE is also consulting on changes to the New Zealand Emissions Trading Scheme (ETS), which will enable carbon prices to better align with carbon budgets.[12]
- The Ministry of Business, Innovation and Employment (MBIE) is working with the Energy Efficiency and Conservation Authority (EECA) to improve process heat's energy efficiency and increase renewable energy.[13] MBIE is expected to release the draft Emissions Reduction Plan for the heat, industry and power sector component of the energy sector later this year.
- The Government is preparing to reform the *Resource Management Act 1991* (RMA), seeking to replace is with three new acts. At the time of writing, parliament was consulting on its proposed Natural and Built Environments Act (NBA) that would provide for land use and environmental regulation and be the primary replacement for the RMA)
- The Gas Industry Company (GIC) is undertaking a market investigation into role of gas in supporting the energy transition and the fitness of current market, commercial and regulatory settings to support decarbonisation (at request of the Minister for Energy and Resources).[14]

Firstgas is actively engaging with government officials on these work streams to ensure that the role and benefits of natural gas in New Zealand's energy mix is reflected in the government's policies. We are also outlining and demonstrating the potential for net zero carbon gases in our transition to net zero emissions and advocating for policy settings that will support this opportunity.

11. *Phasing out fossil fuels in process heat*, Ministry for the Environment, April 2021, https://consult.environment.govt.nz/climate/phasing-out-fossil-fuels-in-process-heat/supporting_documents/phasingoutfossilfuelsinprocessheat.pdf
12. Proposed changes to NZ ETS and SGG levy regulations 2021, Ministry for the Environment, April 2021, https://consult.environment.govt.nz/comms/proposed-nz-ets-changes2021/supporting_documents/proposedchangestoNZETSandSGGlevyregulations2021.pdf
13. Consultation on this was undertaken through *Discussion Document: Accelerating renewable energy and energy efficiency*, MBIE, December 2019, https://www.mbie.govt.nz/dmsdocument/10349-discussion-document-accelerating-renewable-energy-and-energy-efficiency
14. *Gas Market Settings Investigation consultation paper*, Gas Industry Company, May 2021, https://www.gasindustry.co.nz/work-programmes/gas-market-settings-investigation/developing-2/consultation-3/document/7263

Impact on upcoming DPP reset and IMs review

Government action on climate change policy is occurring at the same time as the Commerce Commission is preparing to commence two key work streams:

- The DPP reset for gas pipeline businesses for the next regulatory control period (2022 – 2027). Decisions on our price-quality path will need to be determined by the end of May 2022.
- A review of the Input Methodologies for GPBs, electricity distribution businesses and airports. This IMs review must be completed by December 2023.

To help guide this work, the Commission released an open letter seeking views on emerging issues for electricity networks, gas networks and airports in relation to Part 4 regulation under the *Commerce Act 1986*. The Commission wanted to understand how it should prioritise these issues when planning its work programme in the near term. Our submission on this open letter outlined the emerging issues we see facing the gas sector, and why in our view the existing regulatory rules are no longer fit for purpose for the environment we face in the upcoming regulatory control period.

We outlined to the Commission our view that the next DPP reset for GPBs (2022 – 2027) should focus on ensuring three outcomes:

1. Reducing the risk of future price escalation and economic asset stranding
2. Continuing to provide sufficient incentives to invest to maintain reliable gas infrastructure
3. Preserving the option of using gas infrastructure for net zero carbon gases in the future

The Commission released its DPP reset process and issues in paper in early August 2021. Firstgas welcomes the opportunity to engage with the Commission and stakeholders throughout this process and discuss how we can ensure a regulatory framework that supports New Zealand's transition to net zero emissions and the opportunities for net zero carbon gases.

3. PREPARING THE BUSINESS FOR FUTURE OPPORTUNITIES AND CHALLENGES

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

3.1 WORK PROGRAMME ESTABLISHED ON NET ZERO CARBON GASES

We support the transition to a net zero-carbon emissions future and welcomed the recent release of the Climate Change Commission's (CCC) final report, outlining the actions that are needed for New Zealand to obtain zero-carbon by 2050. We consider that net zero carbon gases will part of this transition – gas plays a role in all future energy scenarios modelled and provides greater resilience to New Zealand's energy portfolio through diversification with green hydrogen and biogas. We have discussed these opportunities with government departments and await the release of the Government's response to the CCC final report.

Firstgas has established a work programme to explore the potential for net zero carbon gases and how we can develop our network to be able to service this future demand.

3.2 HYDROGEN

In March 2021, we released our report[15] into whether green hydrogen can be used in New Zealand and transported via the existing gas pipeline network. Our report concluded that hydrogen is viable in a zero carbon energy system and that it is feasible to convert Firstgas pipelines to hydrogen — initially as a blend, and then to 100% in the future. The next phase of our work is to begin live trials of hydrogen.

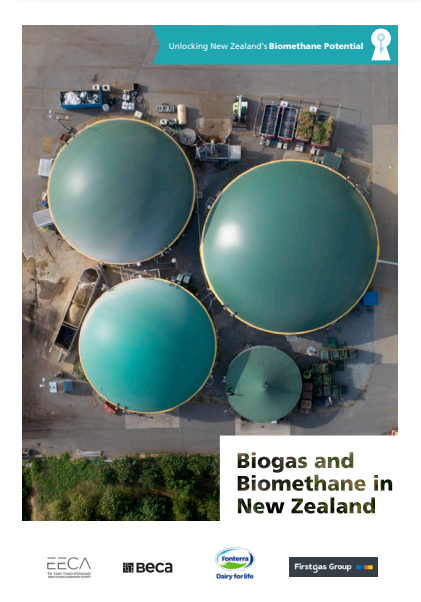
- **Phase 1** 2020 – 2030 Trials and conversion planning
- **Phase 2** 2030 – 2035 Blends hydrogen up to 20% volume
- **Phase 3** 2035 – 2050 Conversion of network branches up to 100% hydrogen.

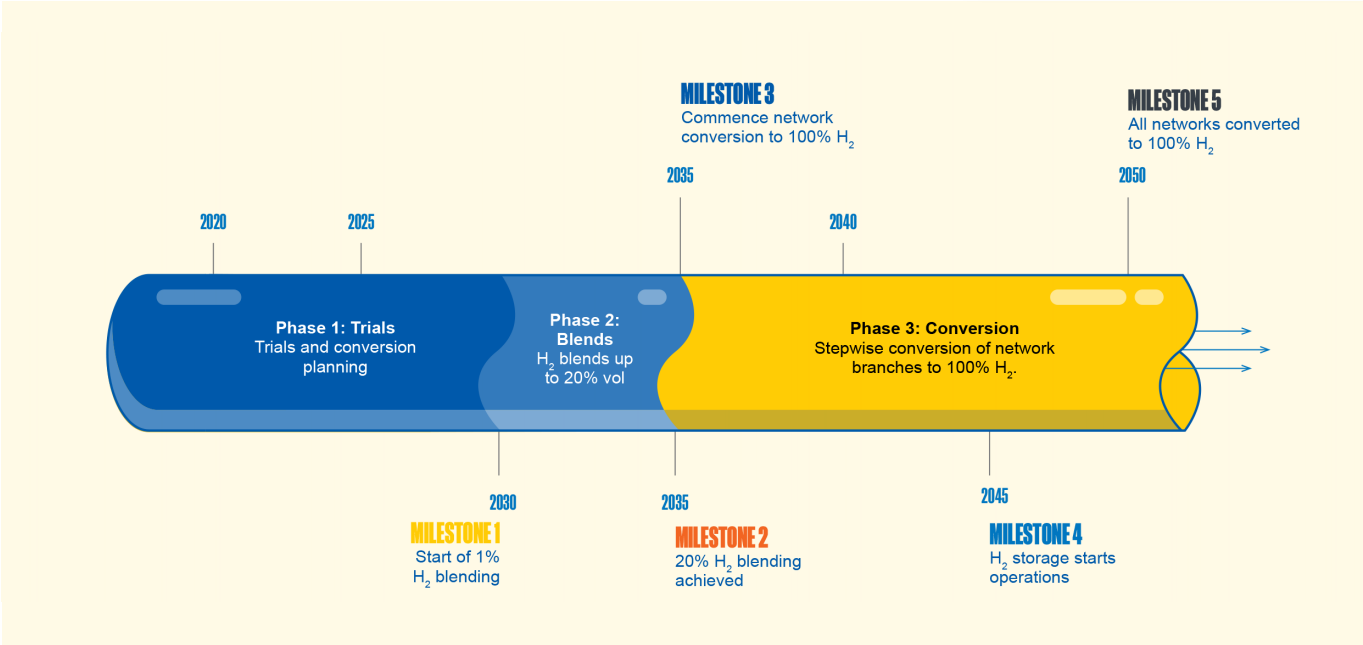
3.3 BIOMETHANE

In addition to hydrogen, we believe that biomethane will also form part of the transition to net zero carbon 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 our gas pipeline.

In June 2021, we released a joint Biogas study[16] with Beca, Fonterra and EECA which revealed that biomethane is a viable, untapped solution to decarbonising New Zealand's natural gas network right now, with the potential to replace nearly 20% of New Zealand's total gas usage by 2050.

Collaboration is the key to successful uptake of Biomethane. It will require cooperation across industries, communities and both the private and public sector to reach its full potential.





15. Bringing Zero Carbon Gas to Aotearoa: Hydrogen Feasibility Study – Summary Report, Firstgas Group, 29 March 2021, https://gasischanging.co.nz/our-path-to-zero-carbon-gas/hydrogen-trial-results/
16. Biogas and Biomethane in New Zealand. The report is available through the Beca website: https://www.beca.com/ignite-your-thinking/ignite-your-thinking/july-2021/biogas-and-biomethane-in-nz-report

4. STAKEHOLDER ENGAGMENT

This section provides an overview of Firstgas' engagement with stakeholders over the past 12 months and how that engagement has shaped our decision making.

4.1 STAKEHOLDER ENGAGEMENT

Firstgas recognises the importance of regular engagement with our major gas users, businesses and customers who rely on the consistent and safe delivery of gas to maintain their ongoing productivity, businesses, and household needs. Our primary focus is to inform and consult with our customers, with four underlying objectives for this engagement:

- Understanding our customers' views and preferences for investment and asset maintenance strategies, services, and pricing decisions
- Informing and consulting with customers on the development of our 2021 AMP Updates and on relevant aspects of the 2022 DPP reset process so that our decisions are informed by our customers' views
- Laying the foundation for future engagement with customers on issues for the 2023 Input Methodologies (IMs) review, future regulatory and government policy processes, and key operational decisions
- Taking tangible steps on a longer-term journey of making the business more customer centric and focusing on the issues that customers value, with customer engagement ultimately becoming part of our business-as-usual process.

4.2 CONTINUED ENGAGEMENT AND RELATIONSHIP BUILDING

Firstgas has continued to engage with retailers, stakeholders, and customers to ensure we can meet the needs of all our customers. In the past year, we have undertaken the following activities:

- In May 2021, we consulted with retailers on the **proposed distribution prices FY2021**. We received a range of responses that were taken into account when setting final prices.
- We are in the process of producing a new retailer agreement for the use of our distribution networks, which is known as a **use-of system agreement (UoSA)**. We released the draft UoSA to retailers for feedback in May 2021 and held two workshops at the Firstgas Wellington offices during June 2021. Following consideration of written feedback received from retailers, Firstgas will now produce a redline version of the UoSA for further discussion with retailers. We intend to publish the final version of the UoSA on our website later in 2021.
- We continue to undertake substantial engagement with gasfitters, builders and developers through the Master Builder and Master Plumber organisations and by attending a range of other industry events. Our engagement in 2021 has been primarily focused on understanding our stakeholder needs and concerns in relation to the Climate Change Commission's report. This has helped inform our Firstgas advocacy campaign known as **"Gas is changing"**, as well as enabled us to provide better information and support to our customers about the potential for net zero carbon gases in New Zealand.
- Firstgas continues to carry out an annual **public opinions survey** to understand the perception of gas energy and Firstgas Group in New Zealand. The last survey was carried out in July 2020 and generated 1,024 responses from a nationally representative sample of all New Zealanders.[17] This work helps inform a range of strategic decisions and initiatives for Firstgas.

4.3 AMP 2021 WEBINAR BRIEFING

For the first time, Firstgas held a webinar on June 2021 to update stakeholders on the preparation of Firstgas' 2021 AMP Update for both our gas distribution and transmission businesses. During this session, we presented our draft asset management plans for the next 10 years, with a focus on the activities for next 12 months. We provided an update on:

- The Pariroa and Gilbert stream projects and our compression strategy on the transmission system
- IT expenditure
- The "Gas is Changing" strategy and the possibilities of using our networks to distribute net zero carbon gases, such as green hydrogen and biogas in the future
- The upcoming DPP reset for 2022 – 2027.

The webinar was interactive, with attendees able to ask questions and respond to polling questions raised during the session. Figure 8 sets out insights we gained from the live polling and **Appendix C** outlines the questions and answers addressed during webinar. A recording of the webinar is available here.

What has changed as a result of stakeholder feedback?

Firstgas has used the feedback and comments from our stakeholder consultation to inform the preparation of the final 2021 AMP Updates. From what we have heard from people, they want to see us continue to provide a reliable and sustainable network that is looking to the future, to ensure gas is an important part of New Zealand's net zero carbon energy mix by 2050.

4.4 MANAGING CONFLICTING INTERESTS

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 our 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. We are legally bound to make decisions that are consistent with the distribution operating codes (which include obligations relating to confidentiality) and we need to comply with the *Gas Act 1992* 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, we will strive to engage with stakeholders in a transparent manner to explain our decisions.

17. Weighted using Statistics NZ census data.

Figure 8: Polling questions and results

ATTENDEES QUESTIONS	39 STAKEHOLDER RESULTS
Which **one** of these outcomes is most important to you/what should Firstgas' core focus be? – Safety – Reliability – Price/Cost – Risk	**Reliability** received the most votes. Followed evenly by safety, price/cost and risk.
Of the areas discussed in today's webinar, which is the one that you would like to see **more** emphasis from Firstgas? – Gas is changing – Growth and customer connections – Compression strategy – Geohazards – IS and security of corporate information – None	**Gas is changing** ranked highest. Others mixed.
Of the areas discussed in today's webinar, which is the one that you would like to see **less** emphasis from Firstgas? – Gas is changing – Growth and customer connections – Compression strategy – Geohazards – IS and security of corporate information – None	**All answers split.** 'None' slightly higher (50%). IS / security and Growth slightly lower.
Do you support our work to date on the use of net zero carbon gases in our network? – Yes, I support it – I only support some of it – No, I do not support it – Unsure	**Yes** came out the highest (82%). Two were unsure. None voted 'no.'
How do you find Firstgas' level of communication and engagement with you? – Too sparse, I would like to hear from you more regularly – About right, I am happy as is – Too much, I would like to hear from you less	The majority think it is **about right and happy**. Two voted that they would prefer more.

5. YEAR IN REVIEW

This section provides an overview of Firstgas' major projects and initiatives over the past year ending 30 September 2021:

- We review our forecast expenditure against the plans stated in our 2020 AMP and discuss the variances in activities undertaken
- The major developments on our network undertaken since our 2020 AMP
- The performance of our network
- Our asset management improvements

5.1 EXPENDITURE SUMMARY

Firstgas remains focused on building and maintaining a safe and resilient gas distribution network for our customers, whilst actively pursuing growth across our network, where economic, and preparing our network for net zero carbon gases. This focus is reflected in the work programme that was undertaken over the last 12 months.

Figures 9 and 10 outline our actual expenditure for the year ended 30 September 2021[18], and compares actual expenditure to the forecasts presented in our 2020 AMP. There is very little variance for both Capex and Opex levels compared to what was published in our 2020 AMP.

Figure 9: Total Capex in FY2019 versus 2019 Capex forecast in the 2018 AMP

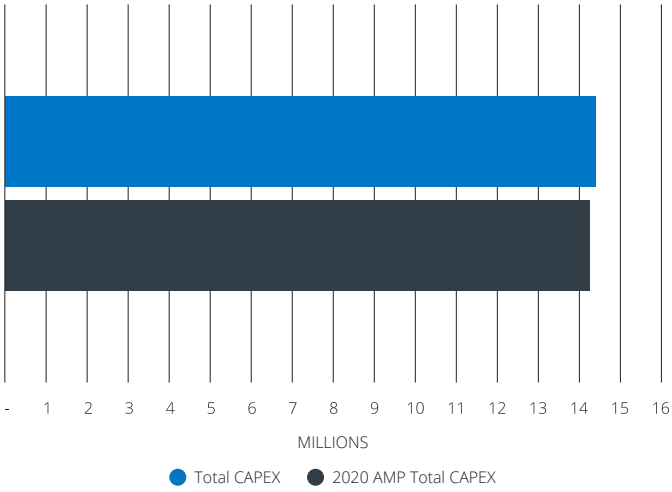
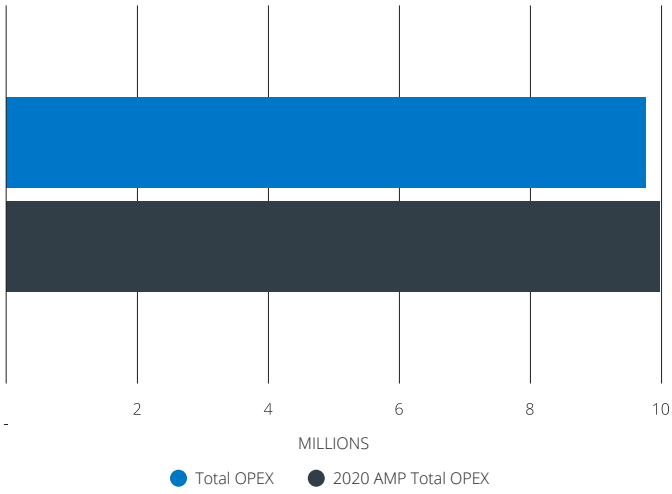


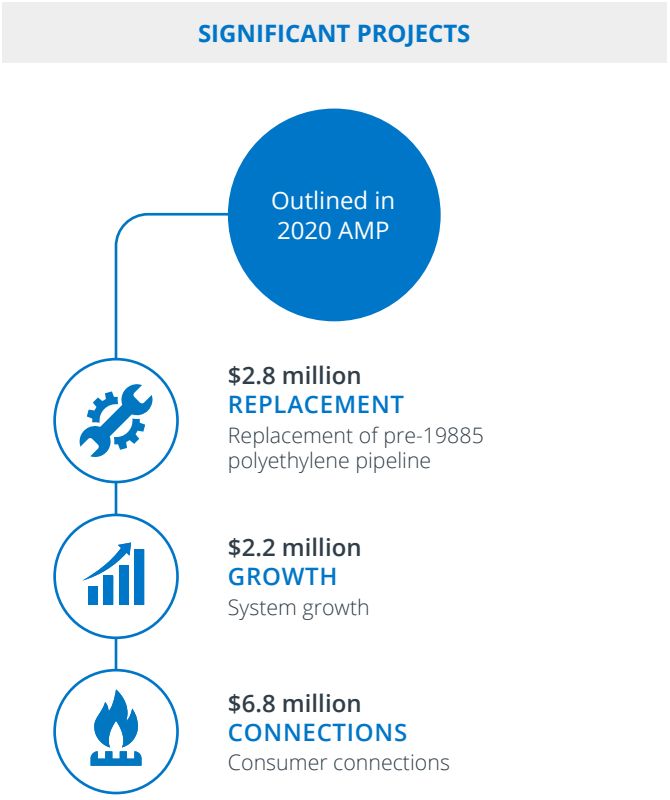
Figure 10: Total Opex in FY2021 versus forecast Opex in 2020 AMP



5.2 SIGNIFICANT ACTIVITIES UNDERTAKEN IN FY2021

The last year has been another busy year for Firstgas. Our improvements and efforts in recent years in Capex management and control have enabled us to deliver another strong full-year forecast result. Figure 11 outlines the most significant projects that were delivered over the last 12 months.

Figure 11: Significant projects completed in FY2021



We discuss these projects below, as well as the significant work we have undertaken through our asset management improvement programme.

Replacement of pre-1985 polyethylene (PE) pipeline

Firstgas is continuing with our programme of work to replace pre-1985 polyethylene (PE) pipeline, with a focus over the next five years on replacing pre-1975 pipeline.

As outlined in the 2020 AMP, PE pipe manufactured before 1985 was made with a polymer structure that over time is susceptible to cracking and significant deformation. Our distribution network includes approximately 396 kilometres of pre-1985 PE mains and approximately 116 kilometres of pre-1985 service pipelines, with the majority located within the Waikato.

18. All data from 30 May 2021 to 30 September 2021 has been forecasted, in order to provide a complete 12 months of data.

We have developed a risk-based approach to prioritising the replacement of pre-1985 pipelines across our network. This is outlined in our *"Pre-1985 Polyethylene mains pipeline replacement strategy"*, which has been developed to support the programme of work and ensure that it is aligned with Firstgas' engineering principles.

Our replacement programme of work has been prioritised based on risk ranking and used as the basis for the asset grade condition information which is summarised in Schedule 12a (see **Appendix B**). Data shows that 3.3% of the total length of the medium pressure polyethylene pipe in our distribution system (approximately 103 kilometres of pre 1985 PE pipeline with intermediate risk) have grade 2 rating. 35 kilometres of the total of 103 kilometres are pre-1975 PE pipeline. Assets with this rating have a material deterioration but the asset condition is still within the serviceable life parameters. Our focus will be on replacing pre-1975 PE pipeline in the next five period.[19]

This year, we have completed 7 projects, replacing approximately 2.5 kilometres of pre 1975 PE pipeline on our network. These projects included remediation works, where we applied repair clamps onto the squeeze-off sections of pre-1975 PE pipeline in Hamilton. These sections of pipe have been identified as potential risk to the public safety, in the unlikely event of a gas leak.

System growth

Firstgas is committed to developing our network to meet customer needs and ensuring we can continue to meet customer demand. Often this means we have to do work on our existing network to reinforce or add capacity to meet this growing demand.

- **Mains extension / subdivision projects:** Over the last 12 months, we have completed over 80 projects across the greater Waikato region as well as Taupo, Tauranga and the Kapiti Coast.
- **Pipeline reinforcement of Hamilton Intermediate Pressure network (IP10):** The Hamilton IP10 network pressure has dropped below its published minimum operating pressure in recent years (MinOP of 800 kPa). This indicates that there is no remaining capacity on the IP10 network. We have undertaken analysis to determine the appropriate approach to address this issue, such as the viability of reducing the minimum operating pressure from 800 kPa to 500 Kpa and understanding what impact this would have on the existing network and growth demand over the next 10-year period.

Our Engineering team has recommended that the Hamilton City IP10 network be redesignated with a MinOP of 500 kPa. This will not impact the existing network performance nor its capacity to meet demand growth. Given this decision, the proposed Capex in FY2019 and FY2020 related to this project can now be deferred.

Figure 12: Pre-1975 pipeline remediation, Hamilton

▲ *Squeeze-off section of the pipe wrapped with black tape*

▲ *Repair clamp installed onto the squeeze-off section of the pipe.*

Figure 13: Pre-1975 pipeline replacement project, with new PE pipe being installed in Hamilton

19. Definition as set by the Commerce Commission.

Figure 14: New (PE) polyethylene pipe installed

Figure 15: Main PE pipe installed next to power cable at the new subdivision in Hamilton

Main PE pipe installed at the back of a new commercial/residential property in Hamilton

Customer connections

A large component of our annual Capex is allocated to connecting new customers to our network. Over the last 12 months, we have carried out work to connect a record number of 1,900 new gas customers. This record number reflects that in FY2021 more customers chose gas for their new or renovated homes (as a proportion of all building consents) than in any of the years since Firstgas was established. Most of these new connections are for residential homes. However, we have also connected several businesses and commercial operations ranging from cafes and laundromats through to large industrial users.

The typical nature of most of our asset base means that these new connections provide value for all users, by ensuring greater asset use and cost recovery over a broader base. Having more customers contributing towards shared costs ultimately means lower costs for all users, which is why new connection expenditure is a priority for Firstgas.

There are several substantial customer-initiated projects that we are currently working on:

- Supply of natural gas to **Winstone Wallboards site at Tauriko** is a significant addition to the gas network and will make it the third largest distribution customer by gas volume. Winstone Wallboards is New Zealand's only manufacturer and largest marketer of gypsum plasterboard, drywall systems, and associated products and services.
- A mains extension supply to **Happy Valley Nutrition in Otorohanga**. This dairy plant will require an estimated 3,550 scm/h of natural gas ($1.7 million).
- A mains extension supply to **OLAM International, milk powder plant in Tokoroa**. This dairy plant will require an estimated of 4,300 scm/h of natural gas ($5 million).

Upgrades to district regulating stations (DRS) and metering equipment

In addition to the significant projects outlined above, Firstgas carries out several DRS upgrades each year to replace equipment that is not meeting our performance standards, or where the assets are now obsolete. Upgrades to DRS and metering equipment enable us to ensure adequate supply of pressure across our distribution networks. Over the last 12 months, we have carried out upgrades on the following assets:

- **Upgrade of the Cambridge DRS:** Replacement of the existing DRS (DR-80210-CA) located within the Cambridge Delivery Point (DP) compound has been completed (as shown in Figure 16 below). This will enable us to meet the growing demand for gas from commercial and industrial customers in Cambridge and Hamilton region, while meeting the Firstgas DRS standard.
- **Upgrade of the Hamilton DRS:** The existing DRS relief valves (DRS 80213) vent to atmosphere and are considered a risk to public safety. Work is underway to upgrade the unit and build a new enclosure, with work planned to be completed in FY2021.

Figure 16: New DRS 80210 unit

5.3 ASSET MANAGEMENT IMPROVEMENT PROGRAMME

In FY2021, we successfully rolled out our Maximo Asset Health Insights (MAHI) application dashboard and started linking asset health to risks and our asset management planning process.

The MAHI application uses several metrics as an input into the software, such as records of outstanding maintenance activities, individual risks items associated with the assets and condition of assets. This information collectively is used to derive an overall health score that is used to support our decisions when developing workplans and prioritising activities.

The asset health index provides a line of sight to expenditure profiles. In other words, expenditure is linked to our assessment of asset condition, targeting our spend to the areas that we believe are needed to reduce risk and maintain asset reliability. As well as providing insights when planning for the work activities, the application provides a geographical presentation of the asset health that will enable more efficient planning for the delivery of work.

Through the development of the MAHI application, we now have visibility of our asset health. Overall, the asset health indicates that it is in good condition.

Maximo Asset Management Planning Tool

The development of the Asset Management Planning tool in Maximo to support our capital expenditure programme has enabled better risk management data recording and reporting in terms of risk mitigation actions and projects are being recorded against the asset. This means any asset integrity / process safety risk issues requiring capital work have a Risk Item Register (RIR) record entered against the asset which then feeds into the asset management planning process.

Figure 17: MAHI showing all DRS health and locations on the map

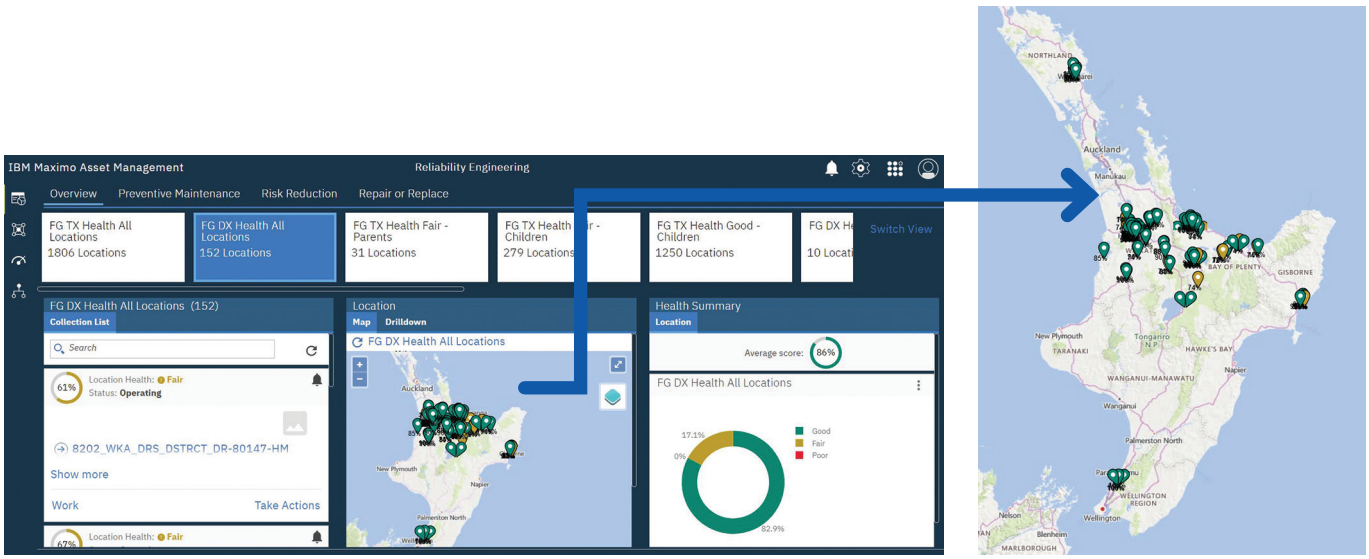
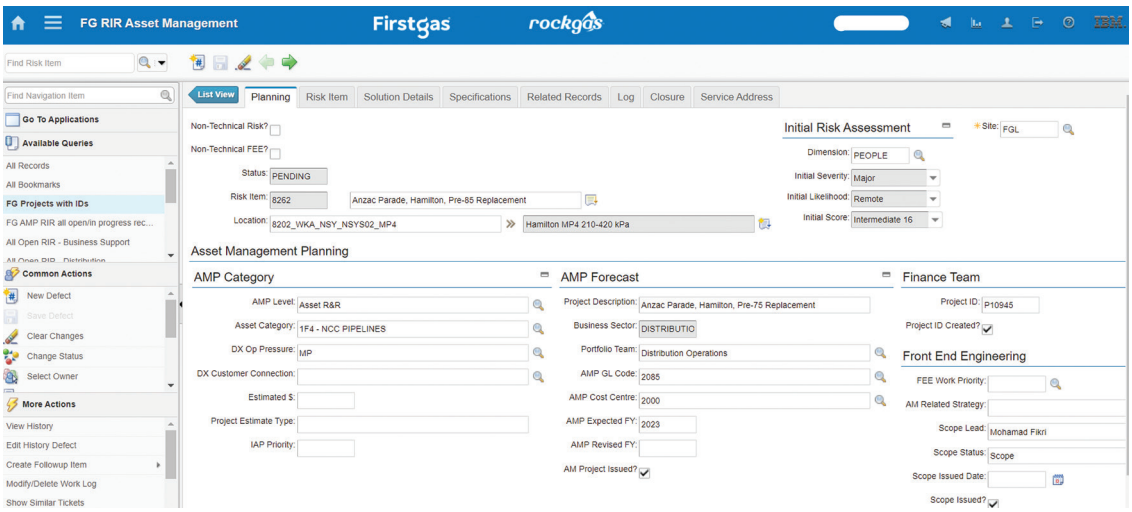


Figure 18: Linking Maximo (RIR) Risk Item Register to Asset Management Planning Tool



Risk Management

Risk management is at the core of what we do. We have evaluated the different risks that our assets are exposed to establish inherent and residual risk profiles – this is essentially the risks before (inherent) and after (residual) we have controls in place to control risk escalation.

We have collated our asset classes health and risk data. The extract of the key assets below in Figure 19 includes the following indicators:

- **Inherent risk:** Risk identified without risk controls implemented
- **Current residual risk:** Risk remaining after risk treatment controls are implemented
- **Current asset health:** It is the health index calculated based on condition, performance and risk. These are each rated using three colours such as green (good), amber (fair) and red (poor) representing different state of health
- **Post RCP3 residual risk:** The level of remaining risk anticipated with the current controls in placed
- **Post planning period residual risk:** The level of remaining risk anticipated relative to aging, obsolescence, and performance issues of some of our assets.

Currently we have a stable risk profile with very little change through the planning period. In the long-term we anticipate that there will be an increase in our risk profile driven primarily through ageing asset. Although our pre-1985 strategy plan is to replace mains pipes according to the risk ranking and this will ensure efficient spending to address the highest risk sections within the distribution network.

The remainder of the pipeline assets will continue to age which may require additional investment to replace to maintain service levels.

Although we continue to monitor our pipeline assets, periodically ageing assets require additional investment to ensure that assets retain the service levels.

In the year ahead section, we discuss our plans to refine this data and incorporate criticality to the asset health data.

5.4 PERFORMANCE OF THE DISTRIBUTION NETWORK

A key premise for the AMP Update is that existing reliability, safety and supply quality levels will be maintained and improved. We have set targets to help drive performance improvements and to measure our progress in delivering reliable, safe, and high-quality service (these targets are detailed in our **2020 AMP** in **Appendix H**). To align with regulatory disclosures, the data presented below covers the year ending 30 September 2020.

- Our KPI scores for FY2020 are reported in the first column of the table.
- The target column refers to the score we aim to achieve over the next 12 months
- The arrow direction compares data between FY2019 and FY2020, if there was an increase, decrease or steady trend. The arrow colour indicates how close the KPI is to the FY2021 target.

Figure 19: Asset health, risk and forecast expenditure

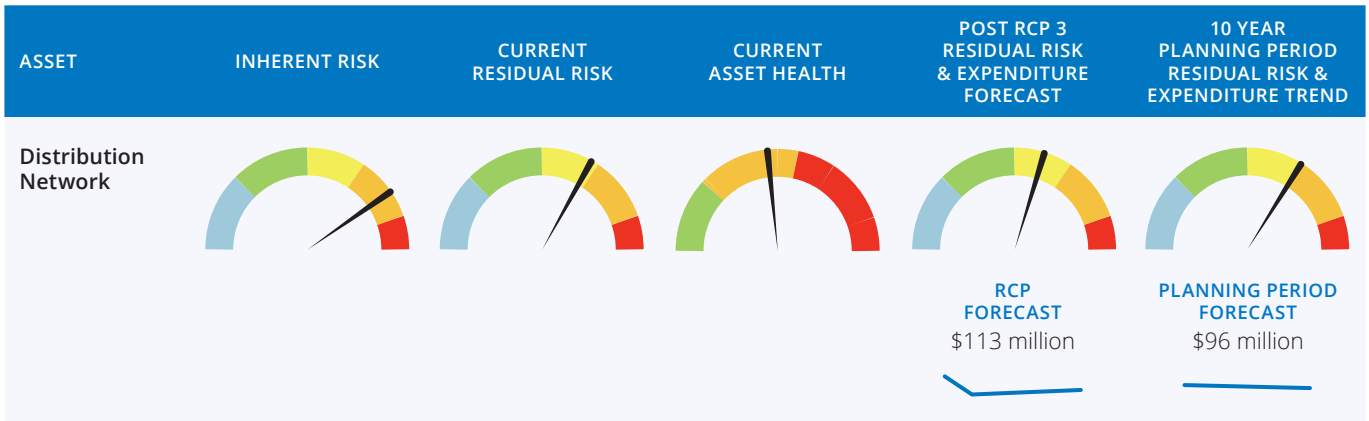


Table 4: KPIs for gas distribution network for FY2020

KEY PERFORMANCE INDICATORS	2020	2021 TARGET	CURRENT TREND
Safety: Lost time injuries	0	**0**	
Response time to emergencies (within one hour)	88%	**80%***	
Response time to emergencies (within three hours)	100%	**100%***	
Number of complaints per customers	0.0001	**0.0005**	
Publicly reported gas escapes	30	**53**	
Third party damage	32	**67**	
Asset Management Maturity Assessment	2.8	**3.0**	
System Average Interruption Duration Index (SAIDI)	1,054	**1,300**	
Customer Average Interruption Duration Index (CAIDI)	105.2	**152**	
Poor pressure due to network causes	8	**3**	
Leaks identified	10	**1.4**	

**Quality measure under Default Price-quality Path (DPP) 2017 – 2022*

Our KPI table above incorporates the two quality standards for our distribution set by the Commerce Commission in its price-quality determination. We continue to meet both of these quality standards. There are two areas where performance has not improved:

- **Poor pressure due to network causes:** This KPI records the number of unplanned incidents where delivery pressure drops due to a network cause. The definition of 'network causes' includes valve and service pipe defects such as corrosion on the aluminum riser, valve seizing, contamination inside the pipeline caused during construction or following repairs. An annual audit is being carried out to identify and correct these issues.
- **Leaks identified:** The increase in the number of leaks detected during a survey coincides with an increase in the frequency of leakage surveys, which are now being performed annually (previously bi-annually). Detection sensitivity has also increased because of the new Street Evaluating Laser Methane Assessment (SELMA) gas leak detector which is highly sensitive to very small amounts of gas.

6. YEAR AHEAD

This section sets out the areas of focus for Firstgas over the year commencing 1 October 2021, the fifth year of the 2017 – 2022 DPP period.

- Our pre-1985 PE pipeline replacement project
- Upgrading and growing our network
- Connections to meet customer demand
- Embedding of our asset management improvement programme and practices

6.1 SIGNIFICANT ACTIVITIES FOR FY2022

Figure 20 sets out the major activities we plan to undertake on our gas distribution network throughout FY2022. The location of these significant projects is shown in Figure 21, with a description of each of these projects below. These projects represent approximately 94% of the overall Capex programme for our gas distribution business for the coming year.

We also provide details on the next steps for our asset management improvement programme.

Figure 20: Significant projects for FY2022

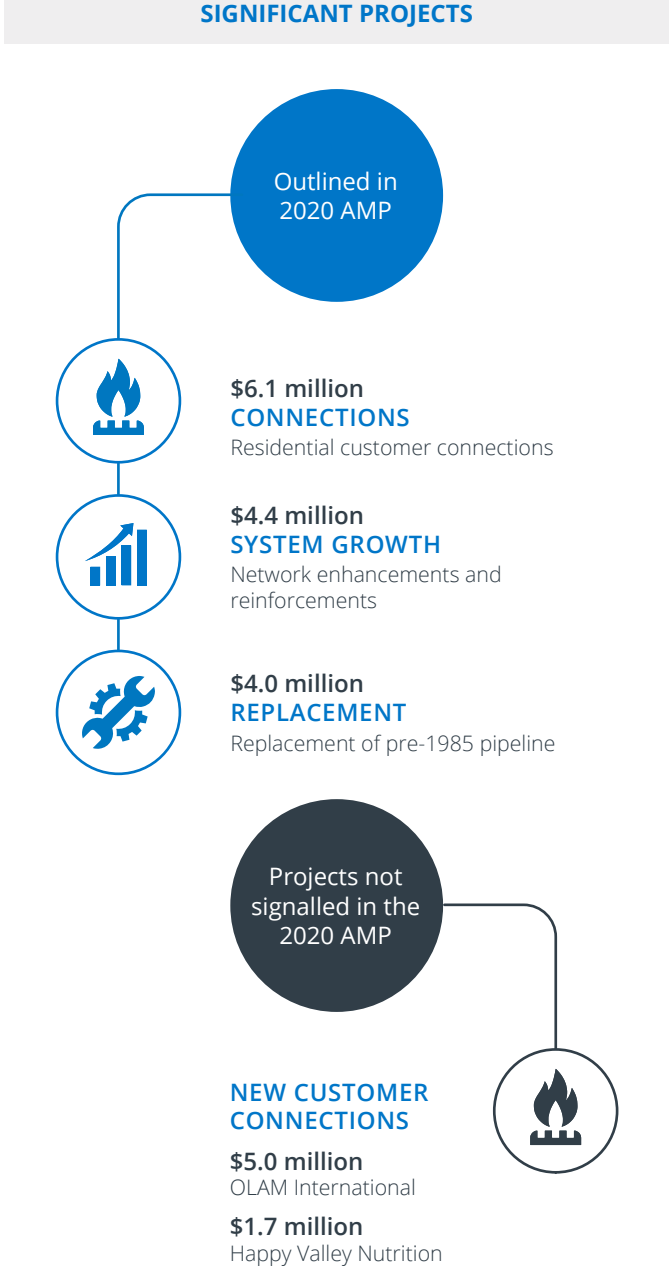
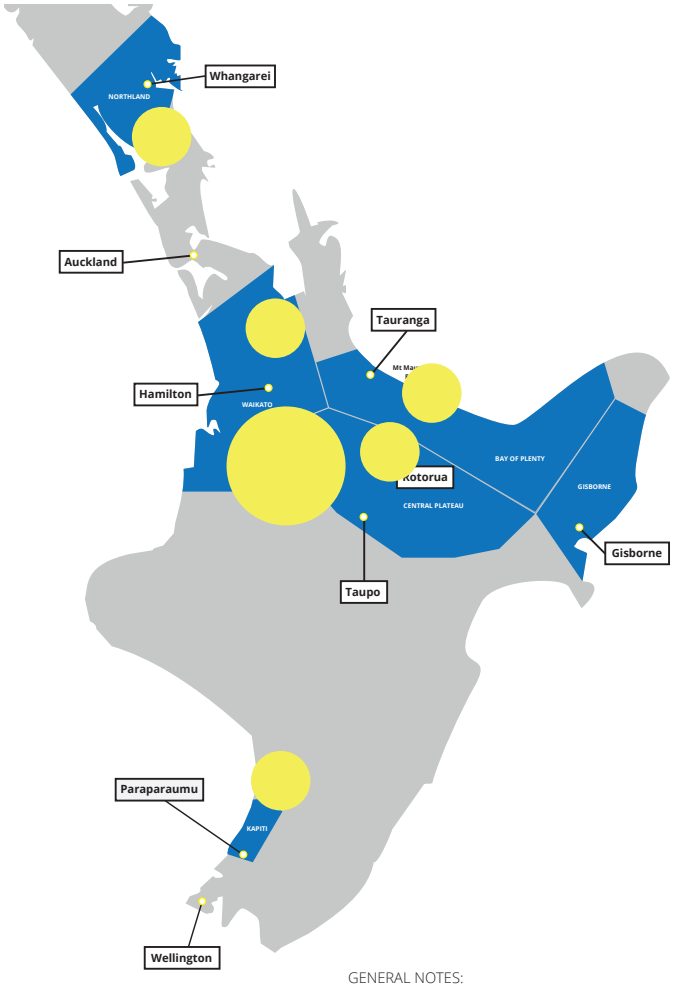


Figure 21: Location of significant projects for FY2022



GENERAL NOTES:
1. Cadastral information sourced from CoreLogic.
2. Topographical information sourced from LINZ Data Service under the Creative Commons Attribution 3.0 New Zealand licence.

Replacement of pre-1985 pipeline

Replacement of pre-1975 PE remains a focus for FY2022, with our programme of work in the next five years prioritising the replacement of approximately 35 kilometres of pre-1975 mains pipe. Pre-1975 PE mains with an intermediate-risk rating has have been given priority over mains installed between 1975 – 1985, as there is a high rate of failures in mains installed before 1975.

Our approach continues to be guided by our asset strategy and risk rankings, as outlined in the year in review section. We have increased our capital spend on replacing pre-1985 pipeline which means there are approximately ten projects (approximately 8 kilometres, mostly in the Hamilton area) with intermediate-risk scores, that have been identified and planned for replacement next year.

Upgrades of DRS and metering equipment

The following upgrade projects are planned for the coming year:

- **Upgrade of the Whakatane DRS (DRS-80251-WH):** The existing DRS has insufficient capacity to supply additional load to the Whakatane Growers customer. The DRS is also non-compliant with Firstgas Standards. We will install new DRS equipment that will both support the customer load requirement and comply with Firstgas standards.
- **Work on Rotorua DRS (DRS-80010):** The existing DRS has been identified as requiring isolation valves for emergency shut down, in order to meet the requirements of *Operating Standard AS/NZS 4645.1:2018 (Gas distribution networks – network management)*. Engineering assessment is underway to identify options to address the issue, with the work planned to be completed in FY2022.

The DRS programme has been prioritised based on the asset condition information gathered by Firstgas and summarised in Schedule 12a (see **Appendix B**). Data shows that 5.4% of the total number of intermediate pressure DRS (five DRS) have a grade 2 rating. Assets with this grade rating have material deterioration but the asset condition is still within the serviceable life parameters. Intervention for grade 2 assets is likely to be required within three years.

System growth

Our system growth activity for FY2022 will incorporate two key areas:

- **Reinforcement of the Hamilton IP DRS:** We will design and install a new IP20/IP10 DRS and interconnecting pipelines west of Te Rapa Road and Wairere Drive Junction in Hamilton. This will provide assurance around the network operating pressure, by increasing the quality of supply and flow capacity.
- **Mains / subdivision extension projects:** Firstgas remains committed to developing and enhancing our network to meet the present and future needs of our customers, whether this be through the existing supply of natural gas or the potential distribution of net zero carbon gases in the future. We have approximately 15 projects planned, predominantly in the greater Waikato region but also in Taupo, Tauranga and the Kapiti Coast.

We have elected to re-allocate the mains extension and subdivision budget (previously under Customer Connections) under System Growth to better support the development and enhancement of our network.

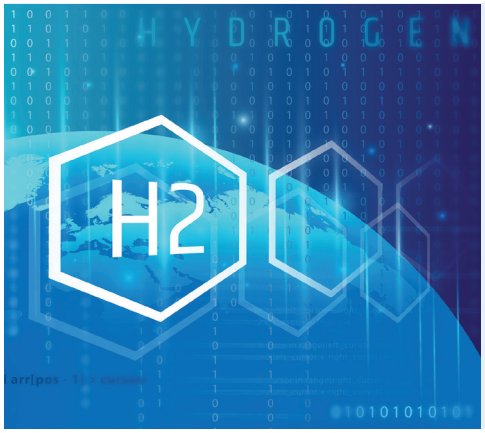
New customer connections

We are planning to connect approximately 2,000 new customers throughout FY2022. All our work on extending the network or constructing new networks to enable future connections is subject to our Capital Contributions Policy and Distribution Pricing Methodology, which are available on our website **here**.

To mitigate the network economic stranding risk, we have significantly increased the proportion of Capex that must be met by capital contributions. This proportion has moved from 7% to 20% in FY2023, growing up to 30% in FY2031. Work is also underway to review and update the Capital Contributions Policy and the accompanying commercial models.

There are two substantial customer-initiated projects that we are currently working on with expected gas on dates between FY2022 and 2023:

- A mains extension supply to Happy Valley Nutrition in Otorahanga. This dairy plant will require an estimated of 3,550 scm/h of natural gas ($1.7 million).
- A mains extension supply to OLAM International, a milk powder plant in Tokoroa. This plant will require an estimated of 4,300 scm/h of natural gas ($5 million).



Our Hydrogen Trials

Transitioning to net zero carbon gases is important if we want to reduce New Zealand's carbon emissions and hydrogen has a big part to play in this change. The release of our Hydrogen Pipeline Trial Study set the foundation for our ongoing delivery work on hydrogen. Work to date has been centred around table-top studies and investigation of the feasibility of Hydrogen. The next step will be introducing hydrogen into our networks, through field-based trials.

We have a number of sites that we are currently evaluating to build our off-grid testing, we are planning to design and install blending and metering equipment to introduce hydrogen into the gas. These trials and demonstrations will act to build our experience and confidence in hydrogen.

6.2 CONTINUING OUR ASSET MANAGEMENT IMPROVEMENT PROGRAMME

Following the successful MAHI implementation, we are now looking at how we can better link our asset criticality information with our risk and health and feed this into our planning processes.

The asset criticality information (an indication of the importance of the asset) will be used in conjunction with the health and risk information to assist with prioritising our activities. In other words, expenditure is linked to our assessment of asset condition, the risk associated with the assets, and the importance of the assets. We target our spend to the areas we believe it is most needed to reduce risk and maintain asset reliability.

The two main features of the framework are the "health" and "criticality" related to an asset.

- **Asset health** is a measure of the useful remaining life of an asset and a key factor in the likelihood of asset failure.
- **Asset criticality** is a measure of the potential consequence because of an asset failure and is a key determinant in quantifying the loss associated with the failure.

Health indices change over time as attributes that affect the probability of asset failure change, such as the physical condition or operating conditions. Criticality indices may change over time when network attributes change, such as the demand supplied or the network configuration. By linking the health and criticality we can better prioritise our investment planning.

Other asset management improvement initiatives we are undertaking include:

- Finalising our asset criticality framework
- Expanding our long-term planning to the wider business
- Delivery of an Integrated Activity plan to facilitate concurrent planning within the business.

Asset condition (Schedule 12A)

Schedule 12A (report on asset condition set out in **Appendix B**) provides an overview of the asset condition using the grading classifications prescribed by the Commerce Commission.[20] Our 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 E, Asset Fleets of the 2020 AMP**.

Figure 22: Criticality and Asset Health Framework

HEALTH CRITICALITY MATRIX		ASSET HEALTH BAND				
		BAND 1	BAND 2	BAND 3	BAND 4	BAND 5
CRITICALITY	C1	25	23	18	13	8
	C2	24	20	15	10	7
	C3	22	19	14	9	3
	C4	21	16	11	5	2
	C5	17	12	6	4	1

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

7. EXPENDITURE FORECASTS

This section lays out the Opex and Capex forecasts and how these forecasts have changed from what was signalled in the 2020 AMP.

7.1 CAPEX FORECAST

Our forecast Capex spend over the next ten years is set out in the blue bars in Figure 23, with forecast from last year's AMP shown in red line. There are changes to the profile and to the total Capex within the current DPP period from that set out in our 2020 AMP.

The changes within this regulatory control period (FY2017 – FY2022) relate to:

- An increase in consumer connection spend in FY2022 of approximately $6.7 million, which is attributable to two new industrial dairy plant customers.
- An increase in asset replacement and renewal expenditure in FY2022 of approximately $1 million to accelerate the replacement programme of pre-1985 polyethylene (PE) pipeline.

The changes within regulatory control periods three and four[21] (FY2022 – FY2031)

- An increase in asset replacement and renewal expenditure of approximately $10 million (total) over the next two regulatory control periods to continue to accelerate the replacement programme of pre-1985 polyethylene (PE) pipeline.
- A significant decrease in the total combined expenditure allocated for customer connections and system growth (approximately $40 million), due to a reduction in our connection forecast and subsequent lower growth demand forecast.

Largest Capex projects going forward

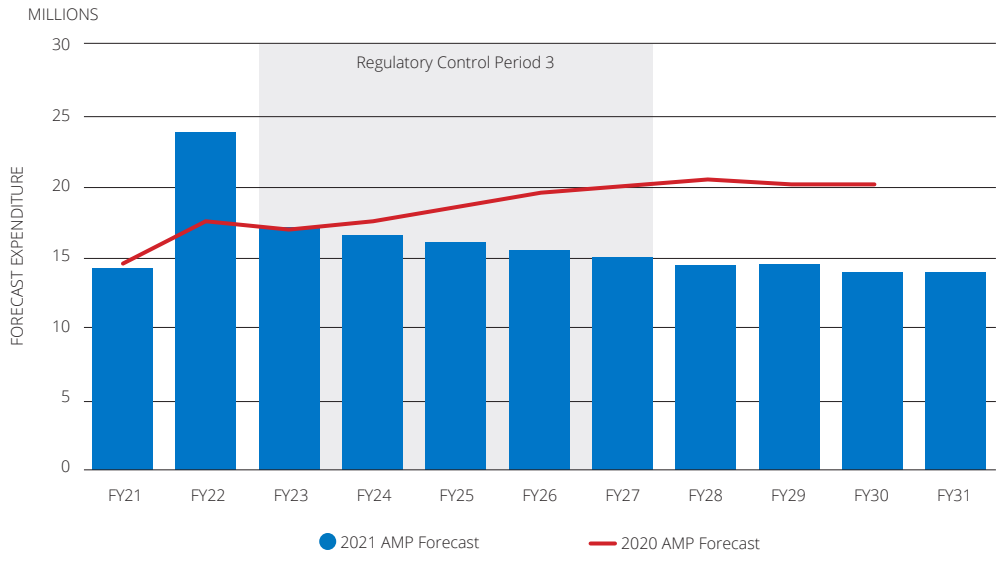
We have continued to incorporate the high-level heat map that shows the largest Capex projects planned for the next ten years (FY2021 to FY2031) in our AMP Update. This heat map is part of the related party transaction information disclosure requirements. Figure 24 sets out the location of the largest ten projects, with greater detail in Table 5.

All network Capex is forecast to be completed by our related party, Gas Services New Zealand Limited (GSNZ) under an operations and management agreement (O&M) between Firstgas and GSNZ. This O&M agreement was entered into with the change in ownership of the distribution business in 2016 and will be reviewed before September 2022.

The map above depicts our anticipated significant planned expenditure during the planning period. It is a snapshot in time, with the information we have available, and may change. As we progress into the 10-year plan, we will develop the activities to according to our processes to develop more accurate forecasts and delivery schedules. The activities will form part of the Information Disclosure requirements for March 2022.

A description of the largest Capex projects identified in table 5 is provided below and more detail can be found in the 2020 AMP. All projects are network projects. Where the identified projects include some reinforcement work, there may be possible future network or equipment constraints. Currently no such constraints have been identified.

Figure 23: Forecast total Capex (all figures in FY2021 prices)



21. Regulatory control period four runs form FY28 through to FY32.

Figure 24: Largest Capex projects

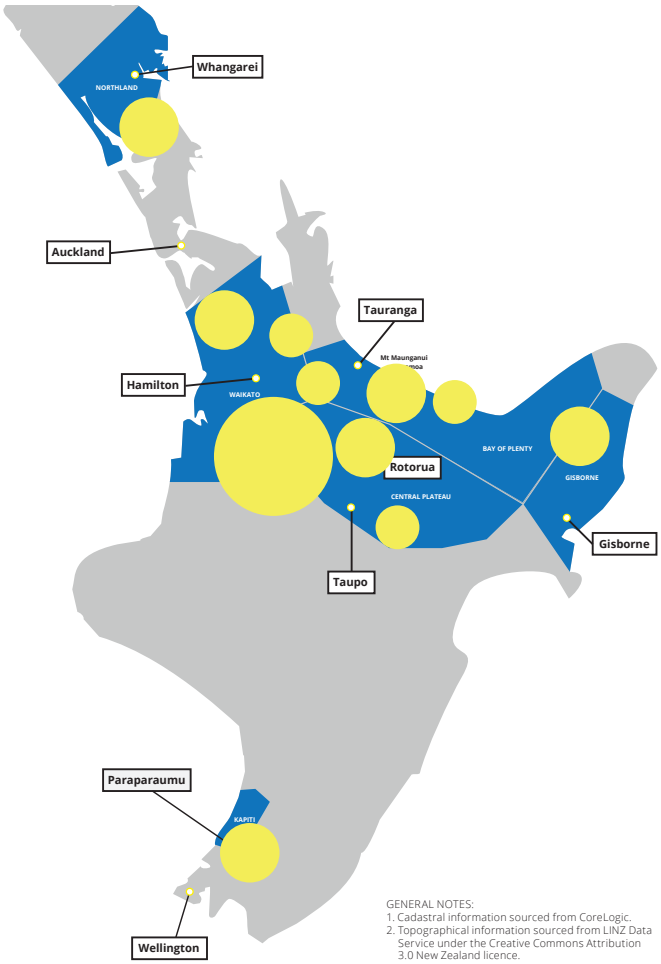


Table 5: Description of largest Capex projects

PROJECT	DESCRIPTION	REGION	COST (CONSTANT $)	PERIOD
Pre-1985 replacement programme	As discussed in section 7, replacement of pre-1985 PE pipe will occur throughout the planning period.	Waikato, Hamilton ($24 million) Bay of Plenty ($8 million) Kapiti ($4 million) Central Plateau ($4 million)	$40 million	Across the period
Mains and subdivision urban growth	To meet the anticipated customer demand in the regions in the near term.	Waikato, Taupo, Tauranga, Kapiti	$39 million	Across the period
Industrial/commercial connections 1. Happy Valley Nutrition 2. OLAM International	As discussed in section 7, we anticipate two major new connections in the next two years: – A mains extension supply to Happy Valley Nutrition in Otorahanga. This dairy plant will require an estimated of 3,550 scm/h of natural gas. – A mains extension supply to OLAM International, milk powder plant in Tokoroa. This dairy plant will require an estimated of 4,300 scm/h of natural gas.	Waikato	$6.7 million	FY2022 – FY2023

7.2 OPEX FORECAST

The forecast Opex over the planning period is set out in the blue bars in Figure 25, with forecast from last year's AMP shown in red line. There is no change within this regulatory control period (FY2017 – FY2022).

The changes within regulatory control periods three and four relate to an increase in network expenditure of approximately $5.4 million (total) over the next two regulatory control periods for our zero-carbon gas trial programme.

Largest Opex projects going forward

We have also continued to incorporate the high-level heat map that shows the largest Opex projects planned for the next ten years (FY2021 to FY2031) in our AMP Update. This heat map is part of the related party transaction information disclosure requirements.

Firstgas does not have specific Opex projects planned for the period. Instead, we have provided the total Opex expenditure. Where it has been possible, we have specified the level of Opex allocated to each region within our network. Figure 26 sets out the location of the planned Opex spend, with greater detail in Table 6.

All network Opex and system operations and network support Opex is forecast to be completed by our related party, GSNZ under an operations and management agreement between Firstgas and GSNZ. This O&M agreement was entered into with the change in ownership of the distribution business in 2016 and will be reviewed before September 2022.

A breakdown of the Opex by region is provided in in table 5 below and more detail can be found in the 2020 AMP. Currently no network constraints have been identified that will result in Opex during this planning period.

Figure 26: Largest Opex spend

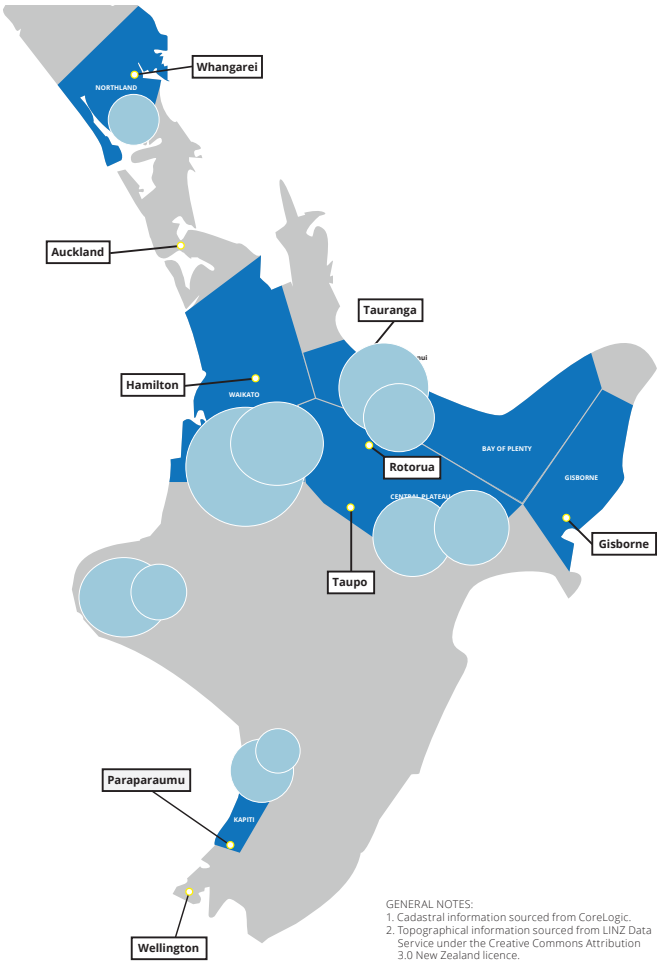


Figure 25: Forecast total Opex (all figures in FY2021 prices)

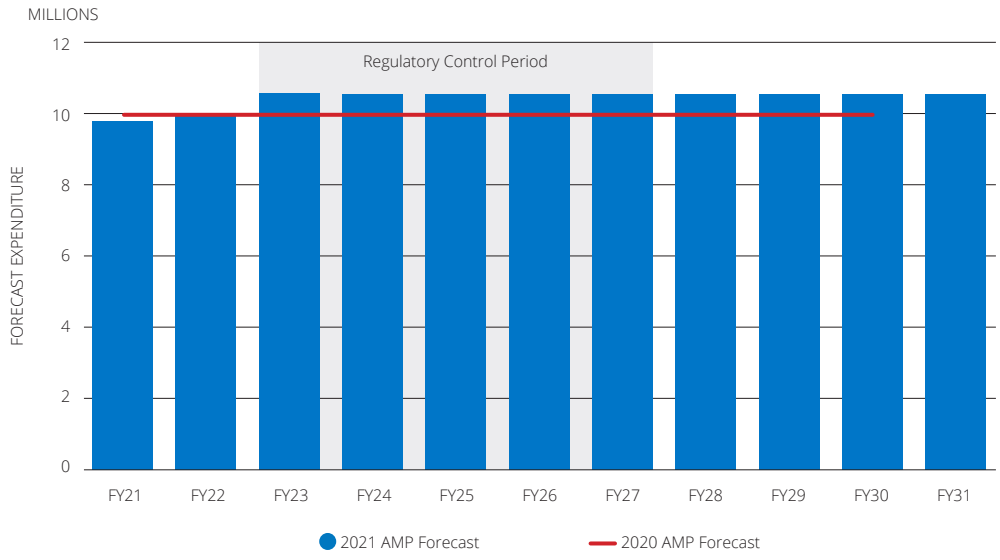


Table 6: Description of largest Opex spend categories

PROJECT	DESCRIPTION	REGION	COST (CONSTANT $)	PERIOD
Service interruptions, incidents, and emergencies	Ongoing costs to support reactive activities in terms of safety response and repair of any part of asset damaged from environmental factors or third-party interference, response to any fault at a station where safety or supply integrity could be compromised, and remediation or isolation works of unsafe network situations.	Waikato ($11.6 million) Bay of Plenty ($4.9 million) Central Plateau ($4.9 million) Kapiti ($4.9 million) Northland ($3.3 million) Gisborne ($3.3 million)	$30 million	Across the period
Routine and corrective maintenance and inspection	Ongoing costs directly associated with operating and maintaining the gas distribution system.	Waikato ($5 million) Bay of Plenty ($1 million) Central Plateau ($1 million) Kapiti ($1 million) Northland ($1 million) Gisborne ($1 million)	$10 million	Across the period
System operations and network support	Ongoing costs to support the management and operation of the network.	New Plymouth	$28 million	Across the period
	Ongoing costs to support distribution operations.	New Plymouth	$29 million	Across the period

APPENDICES

This section sets out the required information disclosure schedules that must be completed each disclosure year. It also summarises the material changes made since the 2020 AMP and includes our signed director certificate.

APPENDIX A: SUMMARY OF MATERIAL CHANGES AND COMPLIANCE

The table below:

- Summarises the material changes in our asset management plan, as compared with our 2020 AMP.
- Demonstrates our compliance with the requirements for an AMP Update, as set out in the *Gas Distribution Information Disclosure Determination 2012* (ID Determination).

Table 7: Summary of material changes and compliance

ID REQUIREMENT	DISCUSSION
Clause 2.6.5 For the purposes of clause 2.6.3, the AMP update must:	
Clause 2.6.5 (1) Relate to the gas distribution services supplied by the GDB.	This AMP Update relates to Firstgas' distribution business. Information on Firstgas' transmission business (GTB) can be found in the separate transmission 2021 AMP Update.[22]
Clause 2.6.5 (2) Identify any material changes to the network development plans disclosed in the last AMP under clause 12 of Attachment A or in the last AMP update disclosed under this clause 2.6.5.	We have deferred the IP10 pipeline reinforcement project in Hamilton project following the Engineering recommendations on next steps. This is explained in section 5 Year in Review.
Clause 2.6.5 (3) Identify any material changes to the lifecycle asset management (maintenance and renewal) plans disclosed in the last AMP pursuant to clause 13 of Attachment A or in the last AMP update disclosed under this clause.	Firstgas has accelerated its work programme to replace pre-1985 pipeline over the planning period. The material change is in relation to increased expenditure of approximately $1million annually to accelerate the replacement programme. This is explained in the Section 6 Year Ahead and Section 7 Expenditure Forecasts.
Clause 2.6.5 (4) Provide the reasons for any material changes to the previous disclosures in the Report on Forecast Capital Expenditure set out in Schedule 11a and Report on Forecast Operational Expenditure set out in Schedule 11b.	There is an overall decrease in expenditure for customer connections and growth. Whilst customer connections expenditure is expected to increase in FY2022 from that forecast in the FY2020 AMP, we are forecasting a reduction in expenditure from FY2023. Expenditure relating to customer connections for FY2022 increases due to two new industrial dairy plant customers connecting to our network. There is a significant reduction of approximately $40 million in the total combined expenditure for customer connection and growth in the next planning period resulting from lower connection and growth demand forecast. There is an overall increase in asset replacement and renewal expenditure over the planning period to accelerate the replacement programme of pre-1985 polyethylene (PE) pipeline. Further information is available in sections 6 Year Ahead and section 7 Expenditure Forecast. There is an overall increase in Opex to support our net zero carbon gas trial programme. Further information on our net zero carbon gas trial programme is available in section 3 Preparing the Business for the Future and section 7 Expenditure Forecast.

22. Information on Firstgas' transmission business is available here: https://firstgas.co.nz/about-us/regulatory/transmission/

ID REQUIREMENT	DISCUSSION
Clause 2.6.5 (5) Identify any changes to the asset management practices of the GDB that would affect a Schedule 13 Report on Asset Management Maturity disclosure.	There are no material changes that would affect Schedule 13 Report on Asset Management Maturity disclosure.
Clause 2.6.5 (6) Contain the information set out in the schedules described in 2.6.6.	Information Disclosure Templates are included in the AMP updates as **Appendix B**.
Clause 2.6.6 Subject to clause 2.13.2, before the start of each disclosure year, each GDB must complete and publicly disclose each of the following reports by inserting all information relating to the gas distribution services supplied by the GDB for the disclosure years provided for in the following reports: 1. the Report on Forecast Capital Expenditure in Schedule 11a. 2. the Report on Forecast Operational Expenditure in Schedule 11b. 3. the Report on Asset Condition in Schedule 12a. 4. the Report on Forecast Demand in Schedule 12b. 5. the Report on Forecast Demand in Schedule 12c.	Information Disclosure Templates are included in the AMP updates as **Appendix B**.
Clause 2.7.2 Before the start of each disclosure year, every GDB must complete and publicly disclose the Mandatory Explanatory Notes on Forecast Information in Schedule 14a by inserting all relevant information relating to information disclosed in accordance with clause 2.6.6.	Information Disclosure Templates are included in the AMP updates as **Appendix B**.

APPENDIX B: INFORMATION DISCLOSURE SCHEDULES

Schedule 11a: Report on forecast capital expenditure

Company Name	**First Gas Limited (Distribution)**
AMP Planning Period	**1 October 2021 – 30 September 2031**

SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

This schedule requires a breakdown of forecast expenditure on assets for the current disclosure year and a 10 year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms. Also required is a forecast of the value of commissioned assets (i.e., the value of RAB additions)
GDBs must provide explanatory comment on the difference between constant price and nominal dollar forecasts of expenditure on assets in Schedule 14a (Mandatory Explanatory Notes).
This information is not part of audited disclosure information.

sch ref												
7			*Current Year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
8		for year ended	**30 Sep 21**	**30 Sep 22**	**30 Sep 23**	**30 Sep 24**	**30 Sep 25**	**30 Sep 26**	**30 Sep 27**	**30 Sep 28**	**30 Sep 29**	**30 Sep 30**	**30 Sep 31**
9	**11a(i): Expenditure on Assets Forecast**		**$000 (nominal dollars)**										
10		Consumer connection	6,658	13,143	6,435	6,237	6,028	5,809	5,578	5,336	5,442	5,183	5,287
11		System growth	3,848	4,792	4,888	4,736	4,577	4,409	4,233	4,047	4,128	3,930	4,009
12		Asset replacement and renewal	3,173	4,998	5,119	5,222	5,326	5,433	5,541	5,652	5,765	5,880	5,998
13		Asset relocations	185	867	884	902	920	938	957	976	996	1,016	1,036
14		Reliability, safety and environment:											
15		Quality of supply	-	51	52	53	54	55	56	57	59	60	61
16		Legislative and regulatory	-	-	-	-	-	-	-	-	-	-	-
17		Other reliability, safety and environment	24	51	52	53	54	55	56	57	59	60	61
18		**Total reliability, safety and environment**	24	102	104	106	108	110	113	115	117	120	122
19		**Expenditure on network assets**	13,888	23,902	17,430	17,203	16,959	16,699	16,422	16,126	16,449	16,129	16,452
20		Expenditure on non-network assets	500	641	626	556	605	550	651	632	732	736	803
21		**Expenditure on assets**	14,388	24,542	18,056	17,759	17,564	17,248	17,073	16,759	17,180	16,865	17,255
22													
23	*plus*	Cost of financing	58	99	68	67	65	64	63	62	63	61	63
24	*less*	Value of capital contributions	799	1,230	2,022	2,074	2,120	2,158	2,188	2,210	2,366	2,376	2,489
25	*plus*	Value of vested assets											
26		**Capital expenditure forecast**	13,647	23,411	16,103	15,751	15,509	15,154	14,948	14,610	14,877	14,550	14,828
27													
28		Assets commissioned	13,650	21,335	17,479	15,712	15,446	15,113	14,874	14,561	14,703	14,494	14,646

	Current Year CY	CY+1	CY+2	CY+3	CY+4	CY+5	CY+6	CY+7	CY+8	CY+9	CY+10
for year ended	30 Sep 21	30 Sep 22	30 Sep 23	30 Sep 24	30 Sep 25	30 Sep 26	30 Sep 27	30 Sep 28	30 Sep 29	30 Sep 30	30 Sep 31
	$000 (in constant prices)										
Consumer connection	6,658	12,885	6,185	5,877	5,569	5,261	4,953	4,645	4,645	4,337	4,337
System growth	3,848	4,698	4,698	4,463	4,228	3,993	3,758	3,524	3,524	3,289	3,289
Asset replacement and renewal	3,173	4,900	4,920	4,920	4,920	4,920	4,920	4,920	4,920	4,920	4,920
Asset relocations	185	850	850	850	850	850	850	850	850	850	850
Reliability, safety and environment:											
Quality of supply	-	50	50	50	50	50	50	50	50	50	50
Legislative and regulatory	-	-	-	-	-	-	-	-	-	-	-
Other reliability, safety and environment	24	50	50	50	50	50	50	50	50	50	50
Total reliability, safety and environment	24	100	100	100	100	100	100	100	100	100	100
Expenditure on network assets	13,888	23,433	16,753	16,210	15,667	15,124	14,582	14,039	14,039	13,496	13,496
Expenditure on non-network assets	500	628	601	523	558	497	578	550	624	616	659
Expenditure on assets	14,388	24,061	17,354	16,733	16,225	15,621	15,160	14,589	14,663	14,112	14,155

Subcomponents of expenditure on assets (where known)

Research and development	-	-	-	-	-	-	-	-	-	-	-

	Current Year CY	CY+1	CY+2	CY+3	CY+4	CY+5	CY+6	CY+7	CY+8	CY+9	CY+10
for year ended	30 Sep 21	30 Sep 22	30 Sep 23	30 Sep 24	30 Sep 25	30 Sep 26	30 Sep 27	30 Sep 28	30 Sep 29	30 Sep 30	30 Sep 31
Difference between nominal and constant price forecasts	$000										
Consumer connection	-	258	250	360	459	548	625	691	797	846	950
System growth	-	94	190	273	349	416	474	524	605	642	720
Asset replacement and renewal	-	98	199	302	406	513	621	732	845	960	1,078
Asset relocations	-	17	34	52	70	88	107	126	146	166	186
Reliability, safety and environment:											
Quality of supply	-	1	2	3	4	5	6	7	9	10	11
Legislative and regulatory	-	-	-	-	-	-	-	-	-	-	-
Other reliability, safety and environment	-	1	2	3	4	5	6	7	9	10	11
Total reliability, safety and environment	-	2	4	6	8	10	13	15	17	20	22
Expenditure on network assets	-	469	677	993	1,292	1,575	1,840	2,087	2,410	2,633	2,956
Expenditure on non-network assets	-	12	25	33	46	53	73	82	107	120	144
Expenditure on assets	-	481	702	1,025	1,338	1,627	1,913	2,169	2,517	2,753	3,100

11a(ii): Consumer Connection

for year ended	Current Year CY 30 Sep 21	CY+1 30 Sep 22	CY+2 30 Sep 23	CY+3 30 Sep 24	CY+4 30 Sep 25	CY+5 30 Sep 26
*Consumer types defined by GDB**	$000 (in constant prices)					
Mains Extensions/Subdivsions	2,055	-	-	-	-	-
Service Connections - Residential	3,916	5,667	5,667	5,384	5,100	4,817
Service Connections - Commercial	685	7,193	493	468	444	419
Customer Easements	2	25	25	25	25	25
	-	-	-	-	-	-
** include additional rows if needed*						
Consumer connection expenditure	6,658	12,885	6,185	5,877	5,569	5,261
less Capital contributions funding consumer connection	645	495	1,232	1,244	1,247	1,244
Consumer connection less capital contributions	6,013	12,390	4,953	4,633	4,322	4,017

11a(iii): System Growth

Intermediate pressure						
Main pipe		-	-	-	-	-
Service pipe	-	-	-	-	-	-
Stations	515	-	-	-	-	-
Line valve	-	-	-	-	-	-
Special crossings	-	-	-	-	-	-
Intermediate Pressure total	515	-	-	-	-	-
Medium pressure						
Main pipe	3,333	4,698	4,698	4,463	4,228	3,993
Service pipe	-	-	-	-	-	-
Stations	-	-	-	-	-	-
Line valve	-	-	-	-	-	-
Special crossings	-	-	-	-	-	-
Medium Pressure total	3,333	4,698	4,698	4,463	4,228	3,993
Low Pressure						
Main pipe	-	-	-	-	-	-
Service pipe	-	-	-	-	-	-
Line valve	-	-	-	-	-	-
Special crossings	-	-	-	-	-	-
Low Pressure total	-	-	-	-	-	-
Other network assets						
Monitoring and control systems	-	-	-	-	-	-
Cathodic protection systems	-	-	-	-	-	-
Other assets (other than above)	-	-	-	-	-	-
Other network assets total	-	-	-	-	-	-
System growth expenditure	3,848	4,698	4,698	4,463	4,228	3,993
less Capital contributions funding system growth	-	-	-	-	-	-
System growth less capital contributions	3,848	4,698	4,698	4,463	4,228	3,993

##			Current Year CY	CY+1	CY+2	CY+3	CY+4	CY+5
		for year ended	30 Sep 21	30 Sep 22	30 Sep 23	30 Sep 24	30 Sep 25	30 Sep 26
110	**11a(iv): Asset Replacement and Renewal**							
111	**Intermediate pressure**		**$000 (in constant prices)**					
112	Main pipe			20	20	20	20	20
113	Service pipe			-	-	-	-	-
114	Stations		281	200	200	200	200	200
115	Line valve			80	80	80	80	80
116	Special crossings			-	-	-	-	-
117	**Intermediate Pressure total**		281	300	300	300	300	300
118	**Medium pressure**							
119	Main pipe		2,784	4,387	4,387	4,387	4,387	4,387
##	Service pipe		-	-	-	-	-	-
121	Station		-	-	-	-	-	-
##	Line valve		-	-	-	-	-	-
##	Special crossings		-	-	-	-	-	-
##	**Medium Pressure total**		2,784	4,387	4,387	4,387	4,387	4,387
##	**Low Pressure**							
##	Main pipe		-	-	-	-	-	-
##	Service pipe		-	-	-	-	-	-
##	Line valve		-	-	-	-	-	-
##	Special crossings		-	-	-	-	-	-
##	**Low Pressure total**		-	-	-	-	-	-
131	**Other network assets**							
##	Monitoring and control systems		2	82	102	102	102	102
##	Cathodic protection systems		67	51	51	51	51	51
##	Other assets (other than above)		39	80	80	80	80	80
##	**Other network assets total**		108	213	233	233	233	233
##								
##	**Asset replacement and renewal expenditure**		3,173	4,900	4,920	4,920	4,920	4,920
##	*less* Capital contributions funding asset replacement and renewal		-	-	-	-	-	-
##	**Asset replacement and renewal less capital contributions**		3,173	4,900	4,920	4,920	4,920	4,920

11a(v): Asset Relocations

*Project or programme**	*Current Year CY* 30 Sep 21	*CY+1* 30 Sep 22	*CY+2* 30 Sep 23	*CY+3* 30 Sep 24	*CY+4* 30 Sep 25	*CY+5* 30 Sep 26
Provisional forecast	185	850	850	850	850	850
	-	-	-	-	-	-
	-	-	-	-	-	-
	-	-	-	-	-	-
	-	-	-	-	-	-
* include additional rows if needed						
All other projects or programmes - asset relocations	-	-	-	-	-	-
Asset relocations expenditure	185	850	850	850	850	850
less Capital contributions funding asset relocations	155	711	711	711	711	711
Asset relocations less capital contributions	30	139	139	139	139	139

11a(vi): Quality of Supply

for year ended

*Project or programme**	**$000 (in constant prices)**					
Quality of supply	-	50	50	50	50	50
* include additional rows if needed						
All other projects or programmes - quality of supply						
Quality of supply expenditure	-	50	50	50	50	50
less Capital contributions funding quality of supply						
Quality of supply less capital contributions	-	50	50	50	50	50

11a(vii): Legislative and Regulatory

	Project or programme						
	Category not utilised						
	** include additional rows if needed*						
	All other projects or programmes - legislative and regulatory						
	Legislative and regulatory expenditure	-	-	-	-	-	-
less	Capital contributions funding legislative and regulatory						
	Legislative and regulatory less capital contributions	-	-	-	-	-	-

11a(viii): Other Reliability, Safety and Environment

	*Project or programme**						
	Other reliability, safety and environment	24	50	50	50	50	50
	** include additional rows if needed*						
	All other projects or programmes - other reliability, safety and environment						
	Other reliability, safety and environment expenditure	24	50	50	50	50	50
less	Capital contributions funding other reliability, safety and environment						
	Other Reliability, safety and environment less capital contributions	24	50	50	50	50	50

11a(ix): Non-Network Assets

Routine expenditure

*Project or programme**						
ICT	494	444	457	386	376	362
Building Refurbishment		34	15	8	53	6
expenditure		50	29	29	29	29
Plant and equipment	6	100	100	100	100	100
**include additional rows if needed*						
All other projects or programmes - routine expenditure						
Routine expenditure	500	628	601	523	558	497

Atypical expenditure

*Project or programme**						
**include additional rows if needed*						
All other projects or programmes - atypical expenditure						
Atypical expenditure	-	-	-	-	-	-
Expenditure on non-network assets	500	628	601	523	558	497

Schedule 11b: Report on forecast operational expenditure

Company Name	**First Gas Limited (Distribution)**
AMP Planning Period	**1 October 2021 – 30 September 2031**

SCHEDULE 11b: REPORT ON FORECAST OPERATIONAL EXPENDITURE

This schedule requires a breakdown of forecast operational expenditure for the disclosure year and a 10 year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms.

GDBs must provide explanatory comment on the difference between constant price and nominal dollar operational expenditure forecasts in Schedule 14a (Mandatory Explanatory Notes).

This information is not part of audited disclosure information.

sch ref												
7		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
8	for year ended	**30 Sep 21**	**30 Sep 22**	**30 Sep 23**	**30 Sep 24**	**30 Sep 25**	**30 Sep 26**	**30 Sep 27**	**30 Sep 28**	**30 Sep 29**	**30 Sep 30**	**30 Sep 31**
9	**Operational Expenditure Forecast**	**$000 (in nominal dollars)**										
10	Service interruptions, incidents and emergencies	3,165	3,152	3,215	3,279	3,344	3,411	3,480	3,549	3,620	3,693	3,766
11	Routine and corrective maintenance and inspection	960	1,067	1,088	1,110	1,132	1,154	1,178	1,201	1,225	1,250	1,275
12	Asset replacement and renewal	-	-	-	-	-	-	-	-	-	-	-
13	**Network opex**	4,125	4,219	4,303	4,389	4,476	4,565	4,658	4,750	4,845	4,943	5,041
14	System operations and network support	2,680	2,926	3,546	3,617	3,690	3,763	3,839	3,915	3,994	4,074	4,155
15	Business support	2,948	3,007	3,067	3,128	3,191	3,255	3,320	3,386	3,454	3,523	3,594
16	**Non-network opex**	5,628	5,933	6,613	6,745	6,881	7,018	7,159	7,301	7,448	7,597	7,749
17	**Operational expenditure**	9,753	10,152	10,916	11,134	11,356	11,584	11,816	12,051	12,293	12,539	12,790
18		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
19	for year ended	**30 Sep 21**	**30 Sep 22**	**30 Sep 23**	**30 Sep 24**	**30 Sep 25**	**30 Sep 26**	**30 Sep 27**	**30 Sep 28**	**30 Sep 29**	**30 Sep 30**	**30 Sep 31**
20		**$000 (in constant prices)**										
21	Service interruptions, incidents and emergencies	3,165	3,090	3,090	3,090	3,090	3,090	3,090	3,090	3,090	3,090	3,090
22	Routine and corrective maintenance and inspection	960	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046	1,046
23	Asset replacement and renewal	-	-	-	-	-	-	-	-	-	-	-
24	**Network opex**	4,125	4,135	4,135	4,135	4,135	4,135	4,135	4,135	4,135	4,135	4,135
25	System operations and network support	2,680	2,869	3,409	3,409	3,409	3,409	3,409	3,409	3,409	3,409	3,409
26	Business support	2,948	2,948	2,948	2,948	2,948	2,948	2,948	2,948	2,948	2,948	2,948
27	**Non-network opex**	5,628	5,817	6,357	6,357	6,357	6,357	6,357	6,357	6,357	6,357	6,357
28	**Operational expenditure**	9,753	9,952	10,492	10,492	10,492	10,492	10,492	10,492	10,492	10,492	10,492
29	**Subcomponents of operational expenditure (where known)**											
30	Research and development											
	Insurance											
32												
33		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
34	for year ended	**30 Sep 21**	**30 Sep 22**	**30 Sep 23**	**30 Sep 24**	**30 Sep 25**	**30 Sep 26**	**30 Sep 27**	**30 Sep 28**	**30 Sep 29**	**30 Sep 30**	**30 Sep 31**
35	**Difference between nominal and real forecasts**	**$000**										
36	Service interruptions, incidents and emergencies	-	62	125	189	254	321	390	459	530	603	676
37	Routine and corrective maintenance and inspection	-	21	42	64	86	109	132	155	179	204	229
38	Asset replacement and renewal	-	-	-	-	-	-	-	-	-	-	-
39	**Network opex**	-	84	167	253	340	430	522	615	710	807	905
40	System operations and network support	-	57	137	208	281	354	430	506	585	665	746
41	Business support	-	59	119	180	243	307	372	438	506	575	646
42	**Non-network opex**	-	116	256	388	524	661	802	944	1,091	1,240	1,392
43	**Operational expenditure**	-	200	424	641	864	1,091	1,324	1,559	1,800	2,047	2,297

Schedule 12a: Report on asset condition

Company Name	**First Gas Limited (Distribution)**
AMP Planning Period	**1 October 2021 – 30 September 2031**

SCHEDULE 12a: REPORT ON ASSET CONDITION

This schedule requires a breakdown of asset condition by asset class as at the start of the forecast year. The data accuracy assessment relates to the percentage values disclosed in the asset condition columns. Also required is a forecast of the percentage of units to be replaced in the next 5 years. All information should be consistent with the information provided in the AMP and the expenditure on assets forecast in Schedule 11a.

sch ref

					Asset condition at start of planning period (percentage of units by grade)						
8	Operating Pressure	Asset category	Asset class	Units	Grade 1	Grade 2	Grade 3	Grade 4	Grade unknown	Data accuracy (1–4)	% of asset forecast to be replaced in next 5 years
9	Intermediate Pressure	Main pipe	IP PE main pipe	km	-	-	-	-	-	N/A	-
10	Intermediate Pressure	Main pipe	IP steel main pipe	km	-	-	100.0%		-	3	-
11	Intermediate Pressure	Main pipe	IP other main pipe	km	-	-	-	-	-	N/A	-
12	Intermediate Pressure	Service pipe	IP PE service pipe	km	-	-	-	-	-	N/A	-
13	Intermediate Pressure	Service pipe	IP steel service pipe	km	-		100.0%		-	3	-
14	Intermediate Pressure	Service pipe	IP other service pipe	km	-	-	-	-	-	N/A	-
15	Intermediate Pressure	Stations	Intermediate pressure DRS	No.	-	5.4%	38.0%	56.5%	-	4	5.4%
16	Intermediate Pressure	Line valve	IP line valves	No.	1.2%	5.4%	64.5%	9.9%	19.0%	3	6.2%
17	Intermediate Pressure	Special crossings	IP crossings	No.	-	11.8%	82.3%	5.9%	-	3	-
18	Medium Pressure	Main pipe	MP PE main pipe	km	-	3.3%	8.9%	87.8%		3	1.0%
19	Medium Pressure	Main pipe	MP steel main pipe	km	-	7.7%	92.3%	-	-	3	1.9%
20	Medium Pressure	Main pipe	MP other main pipe	km	-	-	-	-	-	N/A	-
21	Medium Pressure	Service pipe	MP PE service pipe	km	-		15.0%	85.0%		3	0.5%
22	Medium Pressure	Service pipe	MP steel service pipe	km	-	50.0%	50.0%	-	-	3	-
23	Medium Pressure	Service pipe	MP other service pipe	km	-	-	-	-	-	N/A	-
24	Medium Pressure	Stations	Medium pressure DRS	No.	-	-	42.9%	57.1%	-	4	-
25	Medium Pressure	Line valve	MP line valves	No.		6.6%	76.4%	7.9%	9.1%	3	0.1%
26	Medium Pressure	Special crossings	MP special crossings	No.	-	-	93.2%	5.1%	1.7%	3	6.7%
27	Low Pressure	Main pipe	LP PE main pipe	km	-	57.1%	-	42.9%	-	3	-
28	Low Pressure	Main pipe	LP steel main pipe	km	-	-	-	-	-	N/A	-
29	Low Pressure	Main pipe	LP other main pipe	km	-	-	-	-	-	N/A	-
30	Low Pressure	Service pipe	LP PE service pipe	km	-	-	100.0%	-	-	3	-
31	Low Pressure	Service pipe	LP steel service pipe	km	-	-	100.0%	-	-	3	-
32	Low Pressure	Service pipe	LP other service pipe	km	-	-	-	-	-	N/A	-
33	Low Pressure	Line valve	LP line valves	No.	-	-	100.0%	-	-	3	-
34	Low Pressure	Special crossings	LP special crossings	No.	-	-	-	-	-	N/A	-
35	All	Monitoring and control systems	Remote terminal units	No.	-	-	-	-	-	N/A	-
36	All	Cathodic protection systems	Cathodic protection	No.	-	6.9%	84.1%	9.0%	-	3	7.0%

Schedule 12b: Report on forecast utilisation

Company Name	First Gas Limited (Distribution)
AMP Planning Period	1 October 2021 – 30 September 2031

SCHEDULE 12b: REPORT ON FORECAST UTILISATION

This Schedule requires a breakdown of current and forecast utilisation (for heavily utilised pipelines) consistent with the information provided in the AMP and the demand forecast in schedule S12c.

sch ref

Forecast Utilisation of Heavily Utilised Pipelines

Region	Network	Pressure system	Nominal operating pressure (NOP) (kPa)	Minimum operating pressure (MinOP) (kPa)	Total capacity at MinOP (scmh)	Remaining capacity at MinOP (scmh)	Unit	Utilisation: *Current Year CY* y/e 30 Sep 21	*CY+1* y/e 30 Sep 22	*CY+2* y/e 30 Sep 23	*CY+3* y/e 30 Sep 24	*CY+4* y/e 30 Sep 25	*CY+5* y/e 30 Sep 26	Comment
Waikato	Hamilton	Hamilton IP10	1,000	500	16,004	142	scmh	15,862	15,926	16,004	16,078	16,156	16,234	The Hamilton IP10 network has had its MinOP changed from 800 to 500 kPa. This has increased the capacity in the IP10 piping network and it is no longer "heavily utilised. This has allowed proposed capital expenditures to IP10 reinforcement to be deferred. The section of IP10 from Te Kowhai gate station to Te Rapa will be upgraded to IP20. This needs to be completed before the winter of 2024.
							kPa	524	519	514	509	504	500	
Waikato	Hamilton	Hamilton MP4 (East)	400	200	12,114	1,051	scmh	11,063	11,121	11,193	11,261	11,339	11,417	High utilisation has caused low pressure issues for some sections of this network. A number of small fixes to network piping have been implemented, but these have not yet solved the problem entirely. The low pressure is occuring in a specific section of piping which may require further reinforcement.
							kPa	233	232	229	228	226	225	
Waikato	Hamilton	Hamilton LP (Fairfield)	5.00	2.50	216	4	scmh	212	212	212	212	212	212	Fairfield LP system is being investigated to identify a specific cause for low pressures in the system.
							kPa	2.58	2.58	2.58	2.58	2.58	2.58	
Bay of Plenty	Opotiki	Opotiki IP20	1,900	950			scmh							Opotiki IP20 sustained a short duration, high flow spike during 2020. This spike is a one time occurrance that has not been previously experienced in the system since monitoring began in 2012 and has not repeated since the event in 2020. No reinforcement is planned to cover this anomaly.
							kPa							
Bay of Plenty	Tokoroa	Tokoroa IP20	1,900	950			scmh							Tokoroa IP20 sustained a short duration, high flow spike during 2020. The cause for the low pressure appears to be related to a flow imbalance between the DRS's feeding the MP4 from the IP20 during this event. This was a one time occurance that has not been repeated and has only occured this one time since 2012. No further reinforcement is planned to cover this anomaly.
							kPa							

** Current year utilisation figures may be estimates. Year 1–5 figures show the utilisation forecast to occur given the expected system configuration for each year, including the effect of any new investment in the pressure system.*

Disclaimer for supply enquiries

The information in this table contains modelled estimates of utilisation and capacity. Any interested party seeking to invest in supply from First Gas Limited's distribution networks should contact their retailer and confirm availability of capacity.

Notes and assumptions

1. A 'heavily utilised' pressure system is a pressure system where the modelled flow rate, at system peak during the gas year, is greater than or equal to 500 scmh, and its utilisation (pressure drop) is greater than or equal to 40% from the nominal operating pressure (NOP). The utilisation of a pressure system is calculated using the formula: [1 – (system minimum pressure / nominal operating pressure)] *100%.
2. The remaining capacity of a 'heavily utilised' pressure system is obtained by examining the modelled flows at various extremity points in each pressure system, and the level at which the minimum operating pressure (MinOP) is reached. First Gas Limited's security standards set the MinOP at 50% of the rated pressure (which equates to approximately 82% of the pipeline capacity) for a pressure system (based on standard operating pressures). The minimum modelled flow rate, analysed at one extremity point, is used to calculate the remaining capacity of the entire pressure system being studied.
3. A forecast model of a pressure system is obtained by applying either its forecast flow rate or an annual growth rate in each forecast year; and scaling its loads evenly to give the system total flow. The resulting minimum system pressure is simulated on this basis.
4. The forecast system flow is populated using the respective network system as tabulated in Appendix I of the First Gas Distribution Asset Management Plan.
5. Stated annual growth rates are averaged across a 5-year planning period.
6. Schedule 12b provides a snapshot in time of the pressure system capacity, at the date of its preparation, and it should be noted that the figures will change over time. Schedule 12b is provided on the basis that it be used for consumer guidance only.

Company Name	**First Gas Limited (Distribution)**
AMP Planning Period	**1 October 2021 – 30 September 2031**

SCHEDULE 12c: REPORT ON FORECAST DEMAND

This schedule requires a forecast of new connections (by consumer type), peak demand and energy volumes for the disclosure year and a 5 year planning period. The forecasts should be consistent with the supporting information set out in the AMP as well as the assumptions used in developing the expenditure forecasts in Schedule 11a and Schedule 11b and the capacity and utilisation forecasts in Schedule 12b.

sch ref

12c(i) Consumer Connections

Number of ICPs connected in year by consumer type

Consumer types defined by GDB	*Current year CY* **30 Sep 21**	*CY+1* **30 Sep 22**	*CY+2* **30 Sep 23**	*CY+3* **30 Sep 24**	*CY+4* **30 Sep 25**	*CY+5* **30 Sep 26**
Residential	1,651	1,835	1,843	1,751	1,660	1,568
Commercial	145	161	153	145	137	129
Industrial	4	4	4	4	3	3
[GDB consumer type]						
[GDB consumer type]						
Total	1,800	2,000	2,000	1,900	1,800	1,700

12c(ii): Gas Delivered

	Current year CY **30 Sep 21**	*CY+1* **30 Sep 22**	*CY+2* **30 Sep 23**	*CY+3* **30 Sep 24**	*CY+4* **30 Sep 25**	*CY+5* **30 Sep 26**
Number of ICPs at year end (at year end)	66,646	68,146	69,546	70,846	72,046	73,146
Maximum daily load (GJ per day)	39,800	39,800	39,800	39,800	39,800	39,800
Maximum monthly load (GJ per month)	1,080,314	1,083,555	1,086,806	1,090,066	1,093,336	1,096,616
Number of directly billed ICPs (at year end)	-	-	-	-	-	-
Total gas conveyed (GJ per annum)	10,434,616	10,497,224	10,560,207	10,623,569	10,687,310	10,751,434
Average daily delivery (GJ per day)	28,588	28,760	28,932	29,026	29,280	29,456
Load factor	80.49%	80.73%	80.97%	81.22%	81.46%	81.70%

Schedule 14a: Explanatory notes on forecast information

Forecasts in this AMP Update are in constant (real) value terms. In preparing Schedules 11a and 11b we have escalated our real forecasts to produce nominal forecasts for Information Disclosure.

While we expect to face a range of input price pressures over the planning period, we have based our escalation approach on the consumer price index (CPI). This has been done to align forecast inflation with the initial 'exposure' financial model prepared for the 2017 gas DPP reset. Therefore, for the purposes of this AMP Update we have assumed changes are limited to CPI rather than adopting more specific indices or modelling trends in network components or commodity indices. Similarly, we have not sought to reflect trends in the labour market.

FOR YEAR ENDED	CPI
FY2021	0.00%
FY2022	2.00%
FY2023	2.00%
FY2024	2.00%
FY2025	2.00%
FY2026	2.00%
FY2027	2.00%
FY2028	2.00%
FY2029	2.00%
FY2030	2.00%
FY2031	2.00%

APPENDIX C: WEBINAR FEEDBACK AND QUESTIONS

Table 8 below sets out the questions raised during the June 2021 webinar with stakeholders and our responses to their queries.

Table 8: Q & As from June 2021 stakeholder webinar

QUESTIONS / FEEDBACK FROM STAKEHOLDERS	OUR RESPONSE AND ACTIONS TO OUR STAKEHOLDER FEEDBACK
How can there be 100% hydrogen distributed in your pipelines in 2040's, when there is likely to still be a core demand for the supply of natural gas?	Our hydrogen trial report shows a possible sequence of converting the gas networks – starting at the outer extremities and working in towards Taranaki. The idea is that those parts of the network with high levels of remaining natural gas demand in 2040 would go relatively later, while those areas with higher demand for hydrogen would go earlier. Actual sequencing decisions will not need to be made for some time to come.
Rod Carr said you should get on with it [action to address climate change and work on zero carbon fuels]. Is Firstgas getting on with it?	Yes. Firstgas has a programme of work to explore the transport of net zero carbon gases through our existing gas infrastructure. Firstgas, along with Beca, Fonterra and EECA has released a joint Biomethane Study that reveals biomethane is a viable, untapped solution to decarbonising New Zealand's residential natural gas network right now. Biomethane has the potential to replace more than 16% of New Zealand's total gas usage by 2050. We also recently released our Hydrogen Feasibility Study that shows that we can introduce hydrogen into the Firstgas pipeline network from 2030 and convert to 100% hydrogen by 2050. Work is now progressing to commence a hydrogen pipeline trial. See section 3 of this AMP Update and our website **www.gasischanging.co.nz**.
What is the cost impact of moving to 100% hydrogen?	The Hydrogen Feasibility Study covers the estimated network costs for gas distribution system conversion. The study suggests that there not much cost impact over and above historical levels of asset replacement and renewal. The study does not cover the full gas transmission system conversion. There are still outstanding research programmes internationally that will help to inform those cost estimates (specifically around high grade steel performance). Consumer cost impacts will be mainly driven by the cost of hydrogen production. The hydrogen study contains some cost projections. However, these are conservative when compared with targets announced overseas, such as the Australia A$2/kg target and the US DOE 'Earthshot' target of US$1/kg by 2030.
The original plan for expenditure on the compressor strategy was $100 million [as stated in the 2020 AMP]. Will that money be spent elsewhere?	No. Our forecast for compression expenditure over the planning period has reduced and has not been reallocated elsewhere.

QUESTIONS / FEEDBACK FROM STAKEHOLDERS	OUR RESPONSE AND ACTIONS TO OUR STAKEHOLDER FEEDBACK
Will the January 2022 shut down [for the Pariroa and Gilbert Stream projects] limit [gas] supply and what are the measures for rationing supply?	Firstgas will be relying on provisions under our existing transmission codes[23] and associated contracts to ensure that gas injection and offtakes are done in the manner requested and required to successfully complete the scheduled work on both the Gilbert Stream realignment and Pariroa tie-in projects. Firstgas is requesting that the largest gas users on the affected parts of the transmission system stop using gas for the duration of the tie-in process. We are also working with other large users to explore any opportunities they may have to minimise gas usage during the period, including using the time to schedule their own maintenance.
Why is the IS security maturity model still the same as in 2017?	The IS model shown was to illustrate an improvement based on the 2017 IS security maturity model and assessment. The original improvement programme spanned three years. A new assessment has already been completed and is based on a 2021 maturity model. The ongoing information security investment will be based on this 2021 maturity model. This new programme will also span multiple years.
Will cost of the OATIS replacement feature in [Firstgas' forecast expenditure] upcoming DPP [reset for 2022 – 2027]?	Yes. The costs associated with the OATIS replacement are factored in as part of the normal technology lifecycle costs and included in our Non networks assets category.
Any insights on the proposed tariffs [for gas transmission customer for the year starting 1 October 2021, FY2022]?	We have undertaken consultation with consumers about the proposed transmission tariffs for the upcoming gas year (starting 1 October 2022), under both the Vector Transmission Code and the Maui Pipeline Operating Code. A letter was sent to all customers outlining the increase in tariffs, and the factors driving these increases. Feedback on the proposed tariffs closed on 18 June 2021. The final tariffs for gas transmission will be published on 2 August 2021 (Maui pricing) and 1 September 2021 (Vector Transmission Code pricing). Any feedback on the proposed tariffs will be incorporated into the Transmission Pricing Methodology for FY2022.

23. The Maui Pipeline Operating Code and the Vector Transmission Code

APPENDIX D: DIRECTOR CERTIFICATE

Certification for Year beginning Disclosures

Clause 2.9.1

We, Mark Adrian Ratcliffe and Fiona Ann Oliver, being directors of Firstgas Limited, certify that, having made all reasonable enquiry, to the best of our knowledge:

a) The following attached information of Firstgas Limited prepared for the purposes of clauses 2.6.1, 2.6.3, 2.6.6 and 2.7.2 of the *Gas Distribution Information Disclosure Determination 2012* in all material respects complies with that determination.

b) The prospective financial or non-financial information included in the attached information has been measured on a basis consistent with regulatory requirements or recognised industry standards.

c) The forecasts in Schedules 11a, 11b, 12a, 12b and 12c are based on objective and reasonable assumptions which both align with Firstgas' corporate vision and strategy and are documented in retained records.

Director: Mark Adrian Ratcliffe

11 August 2021

Date

Director: Fiona Ann Oliver

11 August 2021

Date