



GAS TRANSMISSION

Asset Management Plan 2018

Summary Document



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MESSAGE FROM THE CHIEF EXECUTIVE OFFICER



Dear Stakeholders

Welcome to First Gas Limited's gas transmission Asset Management Plan (AMP) for 2018. We are now into our third year of operation and are continuing to build on the solid platform we have established for our business.

The last year saw the delivery of numerous projects including the upgrade of key compressor stations, preparatory work for our North Taranaki Gilbert Stream realignment project, and initiation of a significant asset management improvement programme. While this was a large work programme, we acknowledge we have delivered only 63% of the ambitious capital works programme set for the year. The deferral of some projects was outside our control, while we have elected to reschedule a number of other projects to later in this DPP period. This change enables us to better manage the resourcing and delivery of our work programme going forward and complete the full capital programme required for our transmission system up to 2022.

In the next year, we intend to undertake the physical works at Gilbert Stream and will focus on substantial upgrades and work on transmission assets across the system, ensuring we maintain a secure and reliable supply of gas for our customers. We will also continue working closely with our stakeholders on the single gas transmission access code (GTAC), with the hope to have an approved code by the end of 2018 or early 2019.

You will notice important presentational changes in this 2018 AMP compared to previous editions. We have listened to your feedback and tried to produce an AMP that is more reader friendly, with a clearer line of sight to how our expenditure is allocated across the system and how it benefits our customers. We have produced this short summary AMP document, highlighting the key activities for the business, looking at both the previous year and year ahead. Supporting this summary document are a number of appendices that provide a greater level of detail and commentary on our transmission system and the required regulatory schedules.

Our summary document includes new "dashboards" that describe asset health and criticality, and how our expenditure programmes are influencing overall asset health and managing risk. These dashboards are a work in progress, with this year's dashboard focusing on our compressor stations. We hope these dashboards will be a valued addition for our customers, and we welcome your feedback on how we can make them most useful to you.

The last 12 months have seen an increased focus on addressing climate change, with the government's announcement of the net zero target for 2050 and consideration of the Zero Carbon Bill. While the transition to a lower emissions economy will bring challenges, we applaud the Government for making climate change action a priority. We believe the best approach to achieving net zero emissions will involve the decarbonisation of multiple energy networks, and that gas networks are an important part of the solution, not the problem.

We are seeing increased interest from coal users in switching to gas to reduce their carbon footprint, and we are also actively exploring ways to reduce the carbon impact of gas consumption. Gas networks provide a flexible, resilient way to transport and store energy, and we will continue our engagement with government and stakeholders to discuss the role that gas can play in this transition.

We look forward to continuing to work with you all over the coming year.

A handwritten signature in blue ink that reads "Goodeve".

Paul Goodeve
Chief Executive Officer

GLOSSARY

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

TERM	DEFINITION
GTB	Gas Transmission Business
HDD	Horizontal directional drilling
HSEQ	Health, Safety, Environment and Quality
IMs	Input Methodologies – documents set by the Commerce Commission which promote certainty for suppliers and consumers in relation to the rules, requirements, and processes applying to the regulation under Part 4 of the Commerce Act 1986.
IT	Information Technology
KGTP	Kapuni Gas Treatment Plant
KPI	Key Performance Indicators
MLV	Main line valve
NZTA	New Zealand Transport Agency
OATIS	Open Access Transmission Information System
Opex	Operational expenditure – the ongoing costs directly associated with running the gas transmission system. This includes costs both directly related to the network (e.g. routine and corrective maintenance, service interruptions/incidents, land management) and non-network related expenditure (e.g. network and business support)
PIG	Pipeline inspection gauge tool
Pigging	A method of internally inspecting, cleaning or gauging a high-pressure pipeline, normally while in service to obtain information on pipeline condition
PJ	Petajoule (unit of energy). 10^{15} joules = 1,000 TJ
RAB	Regulated Asset Base
RTE	Response time to emergencies
SCADA	Supervisory control and data acquisition
TJ	Terajoule (unit of energy) = 10^{12} Joules
UAV	Unmanned aerial vehicle

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1. INTRODUCTION

This is First Gas Limited's (First Gas) gas transmission Asset Management Plan (AMP) for 2018.

First Gas owns and operates all of New Zealand's gas transmission system. Our system transports large volumes of natural gas from production stations to distribution networks and large customers across the North Island.

As the sole provider of gas transmission services, we are regulated by Part 4 of the Commerce Act 1986 and subject to both price-quality path and information disclosure requirements. Producing an AMP each year is one of these requirements, as well as being a key document guiding the operations of our business.

This section outlines the purpose, scope and structure of our 2018 AMP, and provides an overview of both our business and our gas transmission system. We also set out the key regulatory and environment changes that are influencing our gas transmission business.



1.1 PURPOSE OF AMP

The purpose of our AMP is to describe the asset management processes that we use to manage our gas transmission system and its assets. The AMP focuses on how we intend to manage these assets over the next 10 years (the planning period) to both achieve our asset management objectives and meet stakeholder expectations. It also sets out sufficient information so that our customers and stakeholders can understand how we address key asset-related risks, the performance targets we set for our gas system, and how efficiencies and improvements are being achieved across the business.¹

We also take the opportunity to update our stakeholders on our progress against the 2017 AMP Update,² and outline our key priorities for the year ahead. This is an important part of our ongoing engagement with stakeholders and enables our customers to evaluate the value being delivered through our capital programme.

Throughout this AMP, we want to communicate how we will achieve the following important objectives for our gas transmission system:

- **Safety commitment:** Explain that the safety of our staff, service providers and the general public is paramount.
- **Engaged stakeholders:** Consult with our stakeholders, particularly on our planned investments, and inform stakeholders about how we intend to manage the gas transmission system. 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 system.
- **Investment planning:** Provide visibility of forecasted system investment programmes and upcoming medium-term construction works, with a clear rationale as to why planned investments are the best way to meet service requirements.
- **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.³

1.2 PERIOD COVERED BY THE AMP

The AMP covers a ten-year forecast period from 1 October 2018 through to 30 September 2028 (the planning period). This aligns with our 1 October to 30 September financial and pricing year. The expenditure forecasts presented in this AMP are expressed in constant 2018 prices (unless otherwise stated).

The 2018 First Gas AMP was approved by our Board of Directors on 20 August 2018.

1.3 SCOPE OF THE AMP

The 2018 AMP sets out our planned investments in our gas transmission system during the planning period. It explains how we will develop our transmission system, renew our assets and undertake maintenance to provide a safe, reliable and valued service to our customers.

Expenditure forecasts and planned projects over the ten-year planning period are based on analysis of customer, system and asset information and reflect a relatively high degree of accuracy (to the extent reasonably possible) in the descriptions and forecasts. Capital expenditure (Capex) and operational expenditure (Opex) forecast set in the AMP provide important inputs to our annual business plan.

The 2018 AMP complies with the requirements for a full Asset Management Plan, as specified in the Commerce Commission's Information Disclosure Determination.⁴ **Appendix M** provides a detailed reference table, detailing our compliance with each aspect of the information disclosure requirements.

1.4 STRUCTURE OF THE AMP

First Gas has adopted a different approach for its AMP this year, reflecting on the feedback we have received from our stakeholders and staff. We have produced an AMP in two parts:

- **AMP summary:** This standalone document provides an overview of the business, what we have achieved over the past 12 months, and the key activities for the coming year. It also provides a summary of our forecast expenditure over the next 10 years. We have designed this document for those customers and stakeholders who want a concise overview of our asset management plan over the planning period.
- **Supporting appendices:** The appendices support the information provided in the standalone summary and provide a much greater level of detail and commentary on our distribution assets and our asset management practices. The appendices also include all of the regulatory schedules.

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

2. Gas transmission 2017 AMP update available here: <http://firstgas.co.nz/wp-content/uploads/FGL-Gas-Transmission-AMP-2017-Update.pdf>

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

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

The full structure of our 2018 AMP is set out in Figure 1 below.

Figure 1: Structure of our 2018 AMP

AMP SUMMARY DOCUMENT	
Provides an overview and summary of the activities we have undertaken and are planning to undertake for the planning period.	
STANDALONE APPENDICES IN ONE CONSOLIDATED DOCUMENT	
Appendix A	Glossary
Appendix B	Information Disclosure schedules
Appendix C	Network overview
Appendix D	Network maps
Appendix E	Asset details
Appendix F	System schematics
Appendix G	Security of supply
Appendix H	Asset Management approach
Appendix I	Capacity determination
Appendix J	Expenditure overview
Appendix K	Maintenance schedules
Appendix L	Significant projects
Appendix M	Regulatory compliance report
Appendix N	Directors certificate

First Gas also owns and operates a gas distribution business that serves consumers across Northland, Waikato, the Central Plateau, Bay of Plenty, Gisborne and Kapiti. For information on our gas distribution business, please refer to our 2018 Gas Distribution AMP, which can be accessed on our website www.firstgas.co.nz.

2. OVERVIEW OF FIRST GAS

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

2.1 CORPORATE STRUCTURE OF FIRST GAS

First Gas Limited is owned by First State Funds, part of the Commonwealth Bank of Australia's group of companies. First State Funds comprises two infrastructure funds managed by First State Investments. First State Investments (known in Australia as Colonial First State Global Asset Management) is a leading global infrastructure asset manager, overseeing approximately \$240 billion of infrastructure assets across Australia, New Zealand and Europe.⁵

On 20 April 2016, First Gas took control of Vector Limited's gas transmission assets (along with Vector's gas distribution assets located outside Auckland). In a separate transaction, First Gas took ownership of Maui Development Limited's gas transmission assets on 15 June 2016. The creation of First Gas 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.
- An ability to operate the gas transmission system and manage our assets in ways that better serve the interests of our customers.

We recognise that for most customers, gas is an optional fuel choice. Unlike electricity, which is universally used by households and businesses, reticulated natural gas is not a necessity in

New Zealand. This means that gas must be cost-effective and will often need to be actively marketed to compete with other energy options. We remain focused on actively promoting the use of gas and ensuring work signalled in our AMPs maximises the value obtained from our gas transmission system.

First Gas Board

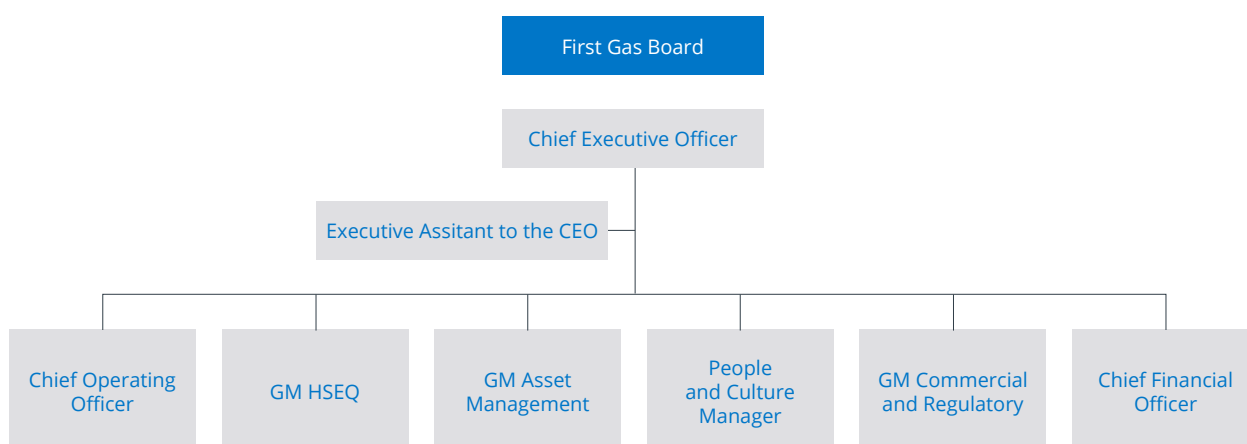
First Gas is governed by a Board of Directors, chaired by Philippa Dunphy. The Board has a mixture of professional infrastructure experience from both sides of the Tasman. Biographies of our Board are available on our website www.firstgas.co.nz.

2.2 ORGANISATIONAL STRUCTURE

First Gas has approximately 170 staff, with most staff based in our corporate headquarters in Bell Block, New Plymouth; and small teams located in Wellington, Palmerston North and Hamilton. Our Executive team is headed by our Chief Executive Officer Paul Goodeve, with six direct reports: the Chief Operating Officer (COO), the Chief Financial Officer, the General Manager Commercial and Regulation, People and Performance Manager, General Manager Asset Management, and General Manager Health, Safety, Environment and Quality (HSEQ).⁶ Our organisational structure is illustrated in Figure 2 below.

The Executive Team was strengthened in early 2018 to add a greater strategic emphasis to the roles of Asset Management and HSEQ.

Figure 2: Organisation chart



5. More information on First State Funds is available on their website <https://www.firststateinvestments.com/global/about-us/corporate-profile.html>

6. Biographies of our Executive Team are available on our website www.firstgas.co.nz.

2.3 FIRST GAS TRANSMISSION NETWORK

First Gas owns and operates a gas transmission system consisting of underground pipelines, compressor facilities and above ground stations in the North Island of New Zealand. The transmission system incorporates both the Maui and non-Maui⁷ transmission pipelines, as set out in Figure 3.

The transmission system is 2,511 kilometres in length, with approximately 137 kilometres installed in urban areas and the remainder in rural areas. The nominal internal diameter of the pipelines ranges from 50mm to 850mm, with the majority installed below ground. The pipelines connect 252 stations that contain a range of equipment designed to receive, transmit and deliver gas safely and efficiently to customers.

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

The key statistics for the gas transmission system as of 30 June 2018, are set out in Table 1.

For a full overview of the gas transmission system, please refer to [Appendix C](#).

Figure 3: High pressure gas transmission pipelines

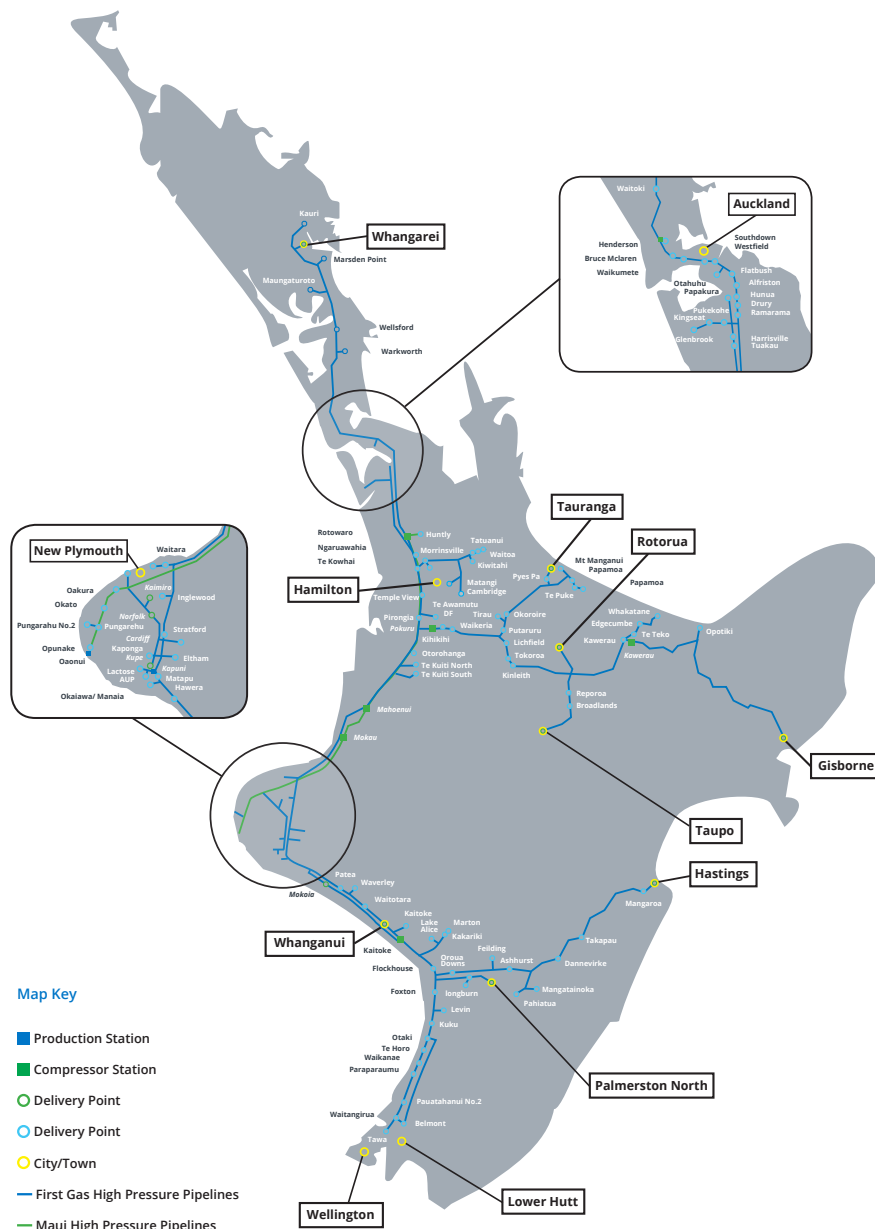


Table 1: Key gas transmission statistics as at 30 June 2018

STATISTIC	VALUE	CHANGE FROM 2017
System length (kilometres)	2,511	0
Compressor stations	9	0
Compressor units	23	0
Delivery points	119	0

7. The gas transmission system purchased off Vector Limited in April 2016.

Asset categories

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

ASSET CATEGORY	DESCRIPTION
Pipelines	Our high pressure pipelines are constructed from steel with wall thickness and material grades specified by appropriate design codes.
Special crossings	Special crossings encompass a variety of crossings installed during pipeline construction. The designs include: – Aerial self-supporting pipelines. – Pipelines supported by aerial trussed structures. – Buried cased crossings where the pipeline is contained in a concentric steel sleeve. – Pipelines supported on flexible bearings.
Cathodic protection (CP) system	In addition to their external coating, pipelines are connected to an impressed current and CP system. This provides secondary protection against corrosion at coating breaches by holding the pipeline at a negative voltage relative to the ground.
Off-pipeline assets (on and off easement)	Transmission pipelines are managed through easements. However, in some areas there may be additional assets that are not located within the easement. These are referred to as off-pipeline assets and are predominantly civil construction type assets. These assets may include the following - retired land blocks, access tracks and culverts, crib or retaining walls, fencing and drainage, ground water monitoring equipment and land movement monitoring equipment.
Main line valves	Main line valves (MLVs) are designed to automatically isolate pipeline sections when pipeline failure occurs. MLVs are positioned at maximum intervals of 32 kilometres throughout the length of the gas transmission system except in the Auckland metropolitan area. In Auckland, MLVs are nominally spaced at 13 kilometre intervals due to the higher consequence of pipeline failures.
Compressor stations	Compressor stations are situated at strategic locations and are designed to increase the pressure of the transport gas to ensure that the required gas pressure and quantity is delivered to the extremities of the system. There are reciprocating, gas turbine, and electric drive compressors in use on our system.
Heating systems	When gas pressure is reduced by pressure regulators at delivery points, the gas temperature reduces. To maintain gas temperature above the lower limit specified in NZS 5442 – Gas Specification for Reticulated Natural Gas, heating systems are required.
Odourisation plants	Gas odourisation is used to provide a means for the detection and location of gas escapes. We odourise gas using electronic pumped odorant injection systems, supported by bulk odorant storage tanks at KGTP and the major receipt points from the Maui transmission pipeline.
Coalescers and filter/separators	Coalescers and filter/separators are used to protect downstream facilities such as compressors, pressure regulators and meters from fine particles of liquid contaminants and impurities in the gas streams.
Metering systems	Metering systems are used to provide accurate gas volume flow data. Meters have rotary-displacement, turbine, ultrasonic, mass flow or diaphragm gas volume measurement mechanisms.

ASSET CATEGORY	DESCRIPTION
SCADA and communications	The SCADA system constantly monitors asset operating conditions at strategic pipeline locations, including high-volume delivery points and delivery points at pipeline extremities. It also provides remote control of compressors and some MLVs.
Gas chromatographs (GCs)	A GC is a chemical analysis instrument for analysing chemical components in a complex sample. It uses flow through a narrow tube known as a column, through which different chemical constituents of a sample pass in a gas stream (carrier gas, mobile phase) at different rates depending on their chemical and physical properties and their interaction with a specific column filling (stationary phase). As the components exit from the end of the column, they are detected and identified electronically.
PIG launchers and receivers	PIG launchers and receivers facilitate the use of In Line Inspection (ILI) survey tools for pipeline condition monitoring and internal cleaning tools. PIG receivers also act to contain and facilitate safe disposal of debris which is removed from the pipeline by PIGs.
Pressure regulators	Pressure regulators reduce the pressure of the flowing gas to a pre-determined downstream pressure. Pressure regulators form part of delivery point equipment that supplies gas at reduced pressure to gas distribution networks, directly to customers or to downstream parts of the transmission system.
Pressure relief valves	Pressure relief valves are installed to protect pipelines or pressure vessels from over pressurisation. Pressure relief valves limit pressure to a pre-determined value by safely venting gas contained within the protected equipment to the atmosphere.
Isolation valves	Isolation valves are used to isolate sections of station pipe work, instrumentation tubing, equipment or control systems to facilitate maintenance, replacement or emergency shutdown.
Filters	Filters are installed to remove solid particulate contamination from the system and protect downstream equipment from erosion by impingement and blockage from build-up of contaminants.
Critical spares and equipment	We own a stock of critical spares and equipment for an anticipated range of pipeline repair options. Whenever new assets are introduced, an evaluation is made of the necessary spares and equipment items required to be retained to support the repair of any equipment failures.

50 years of natural gas

Natural gas transmission is reaching a significant milestone in New Zealand. This coming year will mark 50 years since the first gas fields came online.

New Zealand's oldest production field is the Taranaki Kapuni gas field, that came online in 1969, with the pipeline opening in the following year. The original 200mm (8 inch) pipelines had a total length of 600 kilometres, supplying gas to both Auckland and Wellington. The pipeline route was designed to be as straight as possible, as deviations from a straight line were deemed an unnecessary expenditure. Pipeline laying began with two separate crews, with pipeline camps set up to house and feed the crews as they progressed at a rate of approximately two to three kilometres per day.

Within a couple of months of the pipeline opening, there was a customer base of over 50,000 customers being provided with low cost instant heat for cooking and warming. When the Maui gas reserves were brought online in 1979, this allowed for other large energy projects to be initiated throughout the North Island. These projects included a synthetic petrol plant, methanol plant, an ammonia-urea plant, as well as the gas fired power stations.

The gas transmission system continues to serve customers across the North Island and is a key contributor to the Taranaki community.

Figure 4: Pipeline construction circa 1977



2.4 OUR ASSET MANAGEMENT APPROACH

First Gas' 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.
- **Asset Management System:** This system links our corporate objectives and stakeholder needs to specific asset management approaches through our Asset Management Policy. It aligns 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 First Gas regularly monitor to ensure we provide a safe and reliable gas transmission system. Where appropriate, the targets have been developed to align with the definitions developed by the Commerce Commission for Information Disclosure.

Our AMP captures 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 [Appendix H](#).

Addressing risks on our transmissions 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 First Gas 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 ensures that we are prepared for and can respond quickly to a major incident that occurs or may occur on our gas transmission system.
- **Event management:** This provides clear definitions and guidance for all disciplines working for First Gas in order to ensure a consistent approach in recognising and reporting events.

Given the potentially severe nature of failures on the gas transmission system (particularly loss of containment), appropriate and effective risk management is integral to our day-to-day operations. 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 risks 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.

Greater detail on our approach to risk management set out in [Appendix H](#).

Addressing geohazards on our network

The impact of geo-hazards and how this translates to pipeline integrity risk remains a key focus for First Gas. Geo-hazard is the term we use for land instability events, such as landslides, erosion or movement of rocks or debris, that has the potential to affect the integrity of transmission pipelines.

We have an objective of completing a full geohazard assessment of the transmission network in the next ten years. The assessment involves an initial desktop review and helicopter flight overview. From this, the system risk is assessed based upon observations, known local conditions and specific features into high, medium and low risks.

During discussion on the DPP reset for 2017-2022, we provided the Commission with information on the identified geohazard risks on our transmission system and work underway to address these risks.⁸ An updated table of geohazard risks is shown in Figure 5 below, with greater detail provided in [Appendix C](#).

Figure 5: Summary of geohazard risks on transmission system

LOCATION	HAZARD	ACTIONS	ASSESSED RISK ⁹	CHANGE IN RATING (FROM MARCH 2017)
Gilbert Stream	Loss of pipeline integrity due to erosion of the cliff face	Relocation project released to detailed design and materials ordering. Routine monitoring ongoing.	High	No change
White Cliffs	Loss of pipeline integrity due to the erosion of cliff face	Coastal erosion assessment review was completed by GNS in Jan 2017. Routine monitoring ongoing.	High	No change
Turakina River Crossing	Pipeline exposed on bank side of river	Relocation project released to detailed design and materials ordering. Routine monitoring ongoing.	High	No change
Awakau Road No.1	Pipeline traverses near the crest of a ridge	Pipeline integrity review required. Routine monitoring ongoing.	Intermediate	Changed from High to Intermediate
Mokau Land Movement	Slope Stability	Ongoing monitoring monthly Pipeline Integrity review required.	Intermediate	Changed from High to Intermediate
Awakau Road No.2	Slope Stability	Pipeline Integrity review and Field Assessment required.	Intermediate	Changed from High to Intermediate

8. Appendix G, *Default price-quality paths for gas pipeline businesses from 1 October 2017 to 30 September 202: Draft reasons paper*, First Gas submission to the Commerce Commission, 10 March 2017, http://firstgas.co.nz/wp-content/uploads/Commerce-Commission_Gas-DPP-draft-decision-March-2017.pdf

9. Based on First Gas Geohazard Risk Ranking Tool

LOCATION	HAZARD	ACTIONS	ASSESSED RISK ¹⁰	CHANGE IN RATING (FROM MARCH 2017)
Pukearuhe Strain Site	Pipeline intersects a large active land feature; ongoing land movement has the potential for pipeline deformation from land induced stress	Project plan resulted in the excavation and destressing of the section of pipeline	Low	Changed from High to Low
Waikokowai Rd	Pipeline crosses through the head of an active lobe associated with a larger relic landslide – potential for pipeline deformation from the land movement induced strain	Project scoped to remediate and passed to project delivery team. Routine monitoring ongoing.	Low	Changed from High to Low
Troopers Rd	Pipeline ascends through an area of active landslide slope; ongoing land movement has the potential for pipeline deformation from land movement induced stress	Scope of work include drainage to be installed and overburden removed. Routine monitoring ongoing.	Low	Changed from High to Low.
Wall Road (South)	Pipeline descends through a portion of an active landslide slope associated with a large relic landslide, ongoing land movement has the potential for pipeline deformation from land movement induced stress	Project plan resulted in the excavation and destressing of the section of pipeline. Routine monitoring ongoing.	Low	Changed from High to Low
Mangatea Rd Te Kuiti	Pipeline ascends through an active landslide; ongoing land movement has the potential for pipeline deformation from land movement induced stress	Project plan completed FY2017. Routine monitoring ongoing.	Low	Changed from High to Low
Bexley Station	Slope Stability	Pipeline Integrity review and Field Assessment required.	Low	Changed from High to Low
Mathers Road, Te Kuiti	Landslide	Geotech report and investigation completed.	Low	Changed from High to Low

2.5 CHANGES IN THE REGULATORY ENVIRONMENT

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

Refinements to Part 4 regulation

The last year has seen further refinements of the regulatory regime that oversees our gas transmission business, while First Gas has transitioned to the first year of the new DPP period (2017-2022). The majority of these refinements relate to information disclosure requirements and will increase the level of information we will be required to disclose in future years.

In late 2017, the Commerce Commission published its decisions on outstanding matters from its 2016 review of the Input Methodologies (IMs) that applied to both gas pipelines services and electricity distribution businesses. These decisions led to subsequent changes to the information disclosure requirements to align the disclosure requirements with the IMs. These changes included:

- Changes to the cost allocation methodology for our business and increased reporting on cost allocators.
- Revised definitions for a number of financial inputs to our information disclosures and price path (cost of financing, term credit spread differential and a revised leverage rate).
- Reporting of new recoverable costs and wash-ups (revenue wash-up, capex adjustment, catastrophic events and urgent project allowances).

- New disclosure and reporting requirements for related party transactions.
- Increased audit requirements and narrative in their opinion, focusing on any key matters that have required the auditor's attention and significant judgements.¹⁰

These changes will take effect from 1 October 2018 for our annual information disclosure reporting and in our 2019 AMP, that will be published by 30 September 2019.

Government's climate change policy

Over the past year, we have seen a heightened focus on climate change and how New Zealand will transition to a lower emissions economy. This focus brings both challenges and opportunities for natural gas, and the role that our gas pipeline infrastructure will play in the country's transition.

The Labour-led coalition Government has set a goal of achieving net zero emissions by 2050, supported by a move towards 100% renewable electricity by 2035. To achieve these goals, the Government is introducing a Zero Carbon Bill, that will establish an independent Climate Change Commission (CCC) to set carbon budgets, monitor process and oversee transition plans for impacted sectors. As this Bill is not expected to be formalised until early 2019, the Government has appointed an Interim Climate Change Committee to progress work while the CCC is formally established.

In April 2018, the Government announced that it will not issue new offshore oil and gas exploration permits. This followed a period of uncertainty on how the Government would approach the annual Block Offer process for oil and gas exploration. The policy states that existing offshore exploration and mining permits will be honoured, but that new permits will be restricted to onshore Taranaki.¹¹

The increased focus on climate change and the decision on offshore exploration has created uncertainty for many parties in the gas sector. However, we firmly believe that gas has an important role to play in the shift to a lower-emissions economy, and that gas provides a low carbon solution to some of the most vexing issues of seasonal energy demands, dry year risk, and maintaining energy affordability.

First Gas' approach to addressing climate change

First Gas supports the Government's decision to make action on climate change a priority. We believe that the best approach to achieving net zero emissions will involve the decarbonisation of multiple energy networks, including gas networks. This could be achieved through the production of hydrogen, the use of biofuels, carbon sequestration, or some combination of these technologies. We consider that our gas transmission and distribution networks can be part of the solution. These networks provide a flexible, resilient way to transport energy and already connect the major industrial facilities throughout the North Island and almost 300,000 homes and businesses.

We have engaged Vivid Economics from the United Kingdom to help us understand the role that gas pipeline infrastructure could play in a low-emissions economy. Vivid Economics is looking at potential scenarios for the future use of the gas network, building on the considerable scenario work undertaken to date in New Zealand. We discussed the draft findings of this work with stakeholders during June 2018 and will release the final report later in the year. We look forward to discussing this study with our stakeholders and hope that it informs debate on the best ways to decarbonise the energy system.

We are also actively engaging with government agencies to ensure the benefits of gas pipeline infrastructure are properly incorporated into government policy development. Our June 2018 submission¹² to the Productivity Commission highlighted the important role that natural gas can play in our country's low carbon economy and how New Zealand should keep its options open when assessing how we will achieve the 2050 target.

10. For further information on these decisions, please refer to the *Gas transmission information disclosure determination 2012* (consolidated 3 April 2018), available here: <https://www.comcom.govt.nz/regulated-industries/gas-pipelines/gas-information-disclosure/> and the *Gas transmission services input methodologies determination 2012* (consolidated 3 April 2018), available here: <https://www.comcom.govt.nz/regulated-industries/input-methodologies-2/gas-pipelines-2/>

11. New onshore Taranaki exploration permits will be issued for the next three years, but a decision on whether to continue running Block Offers will be reconsidered after that timeframe.

12. *Draft report – Low-emissions economy*, First Gas submission to the Productivity Commission, 8 June 2018, available here: <http://firstgas.co.nz/wp-content/uploads/First-Gas-submission-to-low-emissions-economy-inquiry.pdf>

3. YEAR IN REVIEW

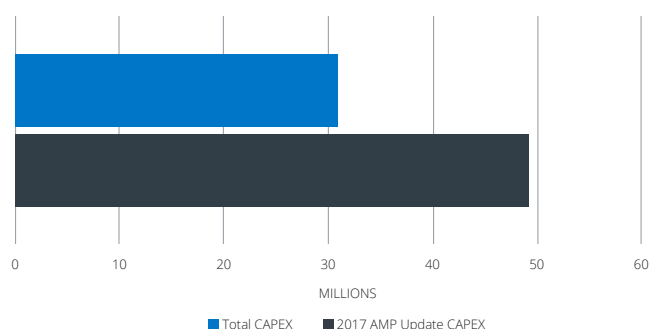
This section provides an overview of First Gas' major projects and initiatives over the past year ending 30 September 2018, the first year of the DPP reset for 2017 – 2022. We review our forecast expenditure against the plans stated in our 2017 AMP Update and discuss the variances in activities undertaken.

3.1 EXPENDITURE SUMMARY

First Gas remains focused on creating and maintaining a safe and resilient network for our customers, and this is reflected in the work that we have undertaken over the last 12 months. Figures 6 and 7 outline our actual expenditure for the year ended 30 September 2017¹³ and compare actual expenditure to the forecasts presented in our 2017 AMP Update.

We set an ambitious work programme for FY2018, and while we have not delivered on all of this work, we still believe that it needs to be done. Some projects have been deferred for reasons outside our control (e.g. GTAC IT system). While, other projects have been deferred as we want to ensure the way we execute the work provides good value and reflects the best possible implementation approach. Subsequently, we have rephased the capital works programme across the remaining years of this DPP period.

Figure 6: Total Capex in FY2018 versus forecast expenditure in 2017 AMP Update



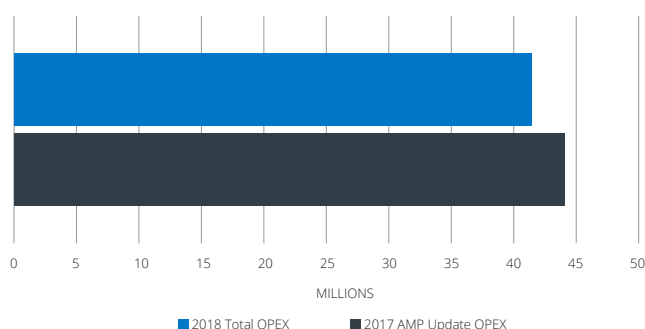
Major variances in expenditure for FY2018 relate to:

- Deferral of the GTAC project to FY2019, due to the GIC not approving the new code this year (\$4.5 million).
- Deferral of the physical enabling works for the Gilbert Stream re-alignment project to FY2019. This deferral was due to the need to verify and optimise the design (\$7.9 million).
- Rescheduling the Warkworth lateral expansion project to end of this DPP period, reflecting updated customer requirements (\$5.1 million).
- Variations to the scope of Turakina River protection works, to enable implementation of a better solution for the site at a lower cost (\$1.3 million).

Other business activities that contributed to the reduction in Capex spend included:

- A review of the capital works plan, with greater emphasis placed on ensuring efficient delivery of the projects in the best seasonal period.
- A review of the asset risk or requirement, with projects re-scheduled to balance the business capacity according to a review of the project benefit and need.
- Forecasts have been developed at a greater level of detail and more heavily scrutinised by the First Gas programme delivery management and asset management teams.

Figure 7: Opex in FY2018 versus forecast expenditure in 2017 AMP Update



Major variances in expenditure relate to a number of one off savings and improvements. Over the year, First Gas has been able to apply economies of scope, brought greater focus on gas assets, and applied learnings from the amalgamation of the Maui and non Maui transmission businesses under a single owner, and operating the pipelines as one gas transmission system.

13. All data from 1 July 2018 to 30 September 2018 has been forecasted, in order to provide a complete 12 months of data.

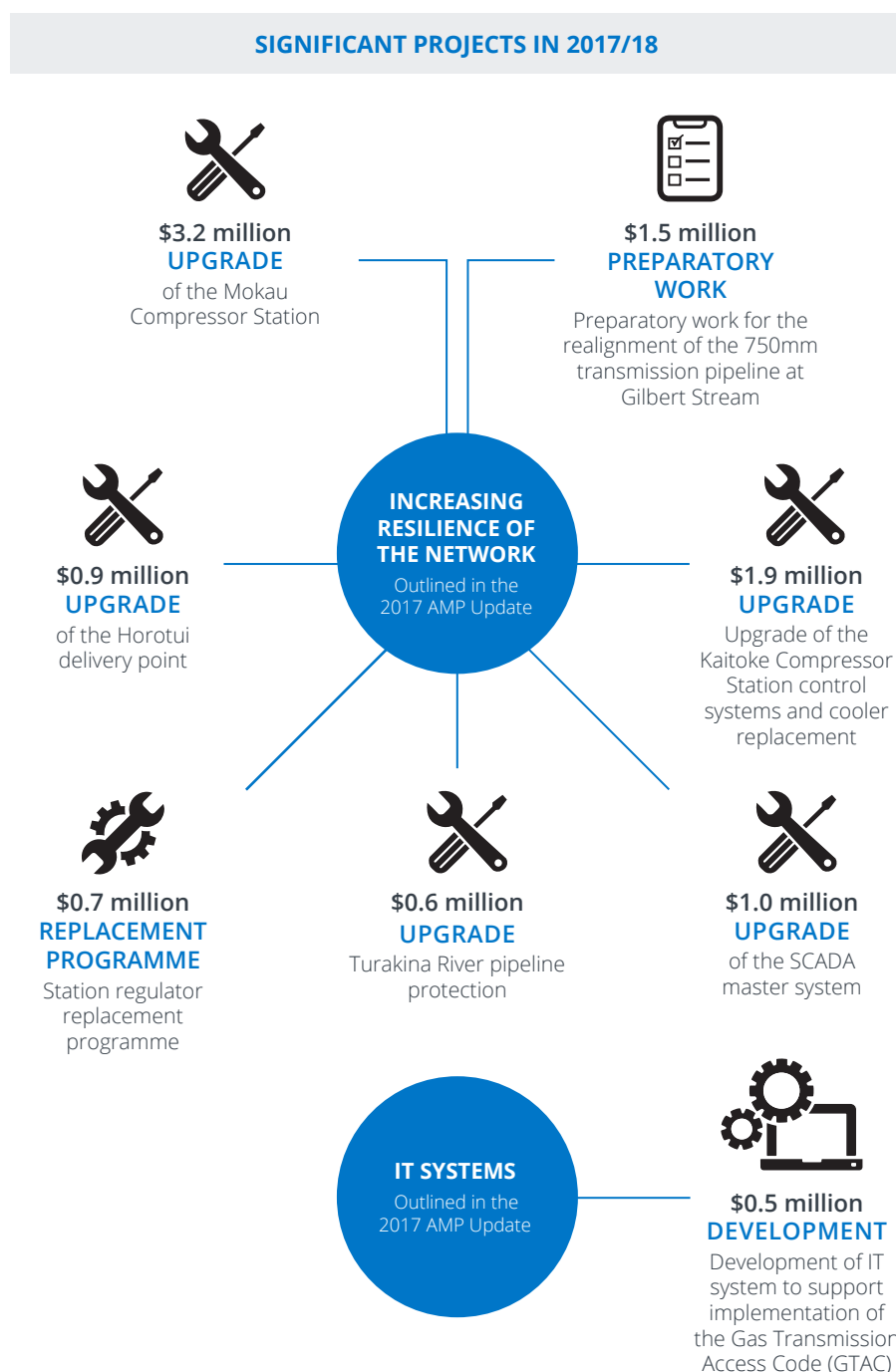
3.2 SIGNIFICANT ACTIVITIES UNDERTAKEN IN FY2018

The last year has been another busy year for First Gas, as we embedded our new business processes, and continued to deliver the significant capital works programme set out for this DPP period (1 October 2017-30 September 2022). Table 2 outlines the most significant projects that were delivered during the last 12 months.

All of these projects were identified in our 2017 AMP Update, with the scope and justification provided for each project.

We discuss these projects over the following pages, as well as our progress on the White Cliffs realignment project, the one area of expenditure that was not approved as part of our DPP reset. We also set out the significant work we have undertaken through our asset management improvement programme.

Table 2: Significant projects completed in FY2018



Upgrade of the Mokau Compressor Station

As part of our strategic compression operating regime review, the Mokau compressor station was planned to be upgraded to provide a pressure increase to the system North of the Mokau. This work was initiated in 2017 and included a significant upgrade of the compressors. This work is ongoing, with the focus now on ensuring the balance of the plant is fit for purpose.

This upgrade project will create efficiencies for our operational compression needs, running costs, maintenance schedules, and replacement horizons. In addition to the activities to upgrade the compressors, additional work is required to ensure that the balance of plant is fit for purpose.

Preparatory work for the Gilbert Stream realignment project

The Gilbert Stream realignment project in Northern Taranaki is a priority for First Gas, with coastal erosion now within ten metres of the 750mm (30-inch) high pressure pipeline at Gilbert Stream.

Over the past year, we have completed significant preparatory work for this project. We have completed the FEED work, completed the emergency response plan, and have commenced detailed design work. The main project execution is now planned for the first quarter of 2019, following the consenting, detailed design and procurement phases (see further detail in section 4.1 below). This deferral of works was driven by the business need to verify and optimise the design of the realignment of the pipeline section.

Upgrade of the Kaitoke Compressor Station control system and cooler replacement

As noted above, First Gas has been reviewing the operating regime for compressors. The system north of Taranaki has redundancy, with major stations at Mokau and Rotowaro able to fulfil similar duties. However, the compression heading south of Taranaki is less resilient, driving the need to do work at the Kaitoke compressor station.

The Kaitoke compressor station is a vital compressor station that maintains the pressure in the southern transmission system and provides a vital pressure boost when required. Over the last 12 months, we have carried out two key activities on the site:

- The replacement of an obsolete and outdated control system for the compressors.
- The replacement of the cooler.

The control system projects and cooler replacement were initiated in FY2017. The control system upgrade was completed in FY2018, with the cooler replacement planned to be installed in FY2019.

Upgrade of the SCADA master system

Our SCADA master system is critical to maintaining gas deliveries to our customers, enabling us to monitor and partially control the gas transmission system on a 24/7 basis. With the rapid advancement of computer technology, our SCADA system hardware platform has reached the upper limit of its lifecycle and is now obsolete and unsupported.

First Gas initiated a project to upgrade our SCADA system in 2017, with the project expected to be completed in FY2018.

Delivery point regulator replacement programme

First Gas has continued with the work programme to replace our fleet of obsolete Grove 80 regulators across the majority of our delivery points.

In 2013, notification was received of the planned obsolescence of the regulators and supporting soft parts by the manufacturer. To address this risk, First Gas purchased a significant number of soft parts for our large population of regulators and established a regulator replacement programme that began 2017. We are targeting a number of sites each year to upgrade regulators to newer equipment.

We intend to complete the replacement programme by FY2021. This replacement programme will reduce the risk of regulator failure and supply disturbances for our customers. In the long-term, First Gas will be moving towards a newer model of regulators, removing the risk around issues with these soft parts.

Upgrade of the Horotiu delivery point



First Gas has upgraded the Horotiu delivery point to support a new customer load in the region.

In late 2017, First Gas received a new customer connection request to expand the ability to supply gas to Open Country Dairy in Horotiu. Open Country Dairy has built a new milk powder processing plant and required gas supply to the new plant by May 2018. The costs for this project are spread across both our transmission and distribution networks.

Development of the new Gas Transmission Access Code



Over the last 12 months, First Gas has continued to develop a single access code to replace the two existing access codes for the gas transmission system.¹⁴

This project was initiated in August 2016 and is a strategic initiative for the New Zealand gas industry. First Gas believes that the consolidation of the two existing codes into the proposed single Gas Transmission Access Code (GTAC) will provide a more effective way of making pipeline capacity available. It should also reduce barriers to market entry and improve the efficiency of the gas market. We have held a number of workshops over the last year to test approaches with our stakeholders and produced a full GTAC in December 2017.

The new code will be supported by new IT system from Tieto, a supplier to gas infrastructure markets in 35 countries. This new fit for purpose system will provide efficiencies in managing the commercial operations of the transmission pipeline system through automated nominations, approvals and scheduling systems.

In May 2018, the industry regulator, the Gas Industry Company (GIC) assessed that the proposed new code was not “materially better” than the existing two codes and identified several specific areas for improvement. While we were disappointed with this outcome, First Gas considers that the GIC assessment provided a good platform for refining the proposed code arrangements in a focused and timely way. Stakeholders have agreed to a targeted work programme to address outstanding issues.

First Gas is seeking to have an approved code by the end of 2018 or early 2019. This will allow for the development of the IT solution in 2019, in advance of a go-live date of 1 October 2019. This AMP incorporates capital cost forecasts for the new IT system that align with this work programme and are consistent with our previous estimates of project cost.

White Cliffs re-alignment project

As detailed in previous AMPs, the White Cliffs project involves the realignment of both high pressure pipelines at White Cliffs, Taranaki. These two pipelines are impacted by ongoing coastal erosion that threatens to eventually expose the pipelines that supply gas across the North Island. Expenditure for this project was not approved as part of the DPP reset, as the Commerce Commission considered that this project required further analysis and scrutiny. This section provides an update on the project planning and our approach to securing funding for this essential project.

Project planning

Planning for this project has continued throughout the year and is now being led through the recently established Major Projects team at First Gas. To inform our project planning, we continually monitor coastal erosion at the site. Our latest monitoring results indicated that the cliff-face erosion has currently stabilised and there have been no significant episodic events.

The FEED study completed in 2016 identified a direct inland realignment route as the preferred option for project implementation. The detailed viability of a longer inland option (the next best alternative identified in the FEED) was reassessed during the year, through an options screening report. The longer inland option has now been discounted due to significant additional cost, land access issues, and the potential technical challenges of longer stretches of Horizontal Directional Drilling (HDDs) required.

This options screening report confirmed that the direct inland route is the most feasible and cost-effective solution. We are now focusing on value engineering the FEED study and working with land owners to ensure our ability to access the site and execute this project.

Funding approach for the White Cliffs project

Given that the White Cliffs project was not included in our DPP allowance, First Gas has been working with the Commerce Commission to identify how we can best secure funding for this essential project.

A range of funding options are available, including a Customised Price-Quality Path (CPP) to replace our DPP. One of the issues we are discussing with the Commerce Commission is whether a more targeted approach to information requirements and verification is possible in this case, given the narrow driver for a CPP application (geohazard risk at one site). While the Commerce Commission's Input Methodologies allow applicants to apply for modifications and exemptions from the standard CPP requirements, the Commerce Commission does not consider that CPP applications should be limited to a single issue or expenditure need. The Commerce Commission instead considers that the principle of “proportionate scrutiny” would apply in such cases, where the level of scrutiny applied would be commensurate with the price and quality impact on consumers.

14. The Maui Pipeline Operating Code (MPOC) and the Vector Transmission Code (VTC).

While the absence of secured funding creates uncertainty over project timing, we continue to believe that the White Cliffs project needs to be done, and we are working to resolve funding issues. While our preference is to progress the required realignment work, we acknowledge that regulatory oversight helps to ensure that our expenditure provides value for money for consumers.

We have reviewed the CPPs completed over the past year (for Powerco and Wellington Electricity) to inform our approach to a possible CPP application. We have also met with our major stakeholders during the year to ensure they are kept up to date of our progress with this major project. Section 4 below sets out plans to progress discussions for White Cliffs in the coming year.

Figure 8: White Cliffs area



Asset Management improvement programme

Over the last year, a number of activities have been initiated to improve our asset management practices and ensure we continue to meet our asset management objectives. This improvement programme is aligned with our increased strategic focus on asset management and included work on the following areas:

- **Review of the Asset Management framework and system:**

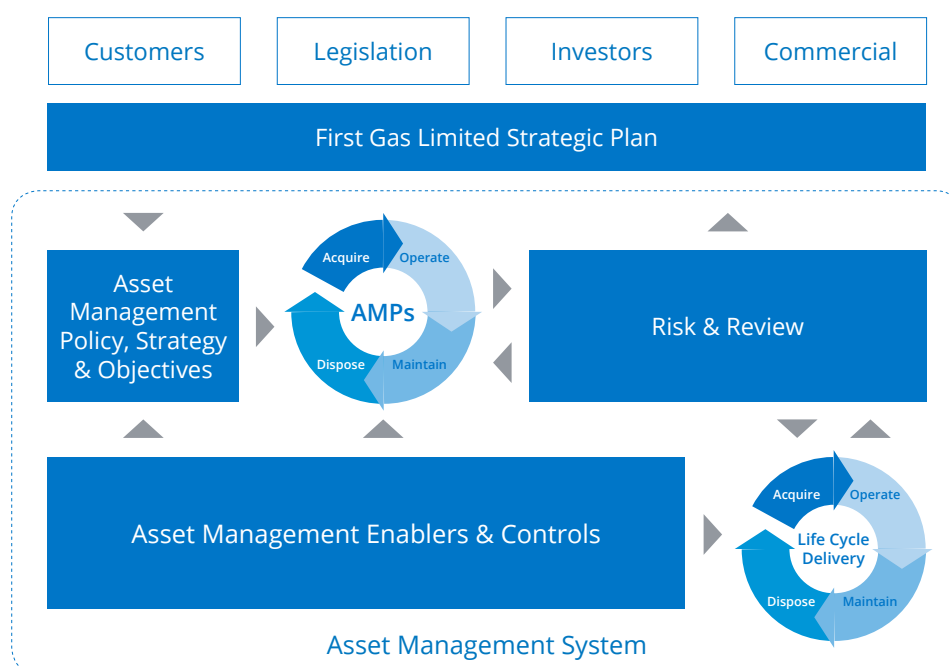
We have reviewed and updated the core elements of the First Gas framework to reflect improved asset management maturity and ensure a clear “line of sight” from the business’ strategic plan and goals down to the individual day to day activities. This is illustrated in Figure 9 below.

- **Updated processes for planning and scheduling:**

We have reviewed and updated the short-term planning and scheduling processes and procedures for our projects. We have also aligned these new processes with the implementation of *Akwire*, a planning and scheduling tool that simplifies and enhances existing functionality of our systems (*Maximo*, our enterprise asset management system).

- **Review of cost governance:** We have reviewed, developed and deployed more robust workflows for management of Capex work programmes, starting from the initiation phase right through to the hand over to project delivery. We have aligned these new processes with the implementation of *Project Server*, a flexible on-premises solution to help quickly start projects, prioritise project portfolio investments and manage projects.

Figure 9: Overview of asset management framework



- **Maintenance optimisation:** We have reviewed maintenance plans and developed maintenance strategies based on eliminating waste and the use of technology to collect and collate information.

Performance of the transmission system

A key premise for the AMP is that existing reliability, safety and supply quality levels will be maintained and improved.

We have set targets to help drive performance improvements and measure our progress in delivering reliable, safe and high-quality service (these targets are detailed in [Appendix H](#)).

The following table shows that we have seen improvement or maintained 100% compliance across a number of areas over the past three years (shown in green). We have also seen performance fall in some areas (shown in red).

Additional information regarding our KPI's and targets is contained in [Appendix H](#).

Figure 10: Key Performance Indicator trend table

KEY PERFORMANCE INDICATORS	2017	TREND	2018 TARGET
Safety: Lost time injuries	0	▶	0
Response time to emergencies	100%	▶	100%
Unplanned interruptions	0	▶	0
Major interruptions	0	▶	0
Environmental	0	▶	0
Asset Management Maturity Assessment	2.7	▲	3
Public reported escapes and gas leaks	4	▲	<5
Compressor reliability	95%	▶	>97%
Lloyds annual audit compliance	1	▲	0
Compressor availability	86%	▶	>95%

4. THE YEAR AHEAD

This section sets out the areas of focus for First Gas over the coming year commencing 1 October 2018, the second year of the DPP reset for 2017-2022. The focus remains on providing our customers with a safe and resilient transmission system, while maturing and optimising our approach to asset management.

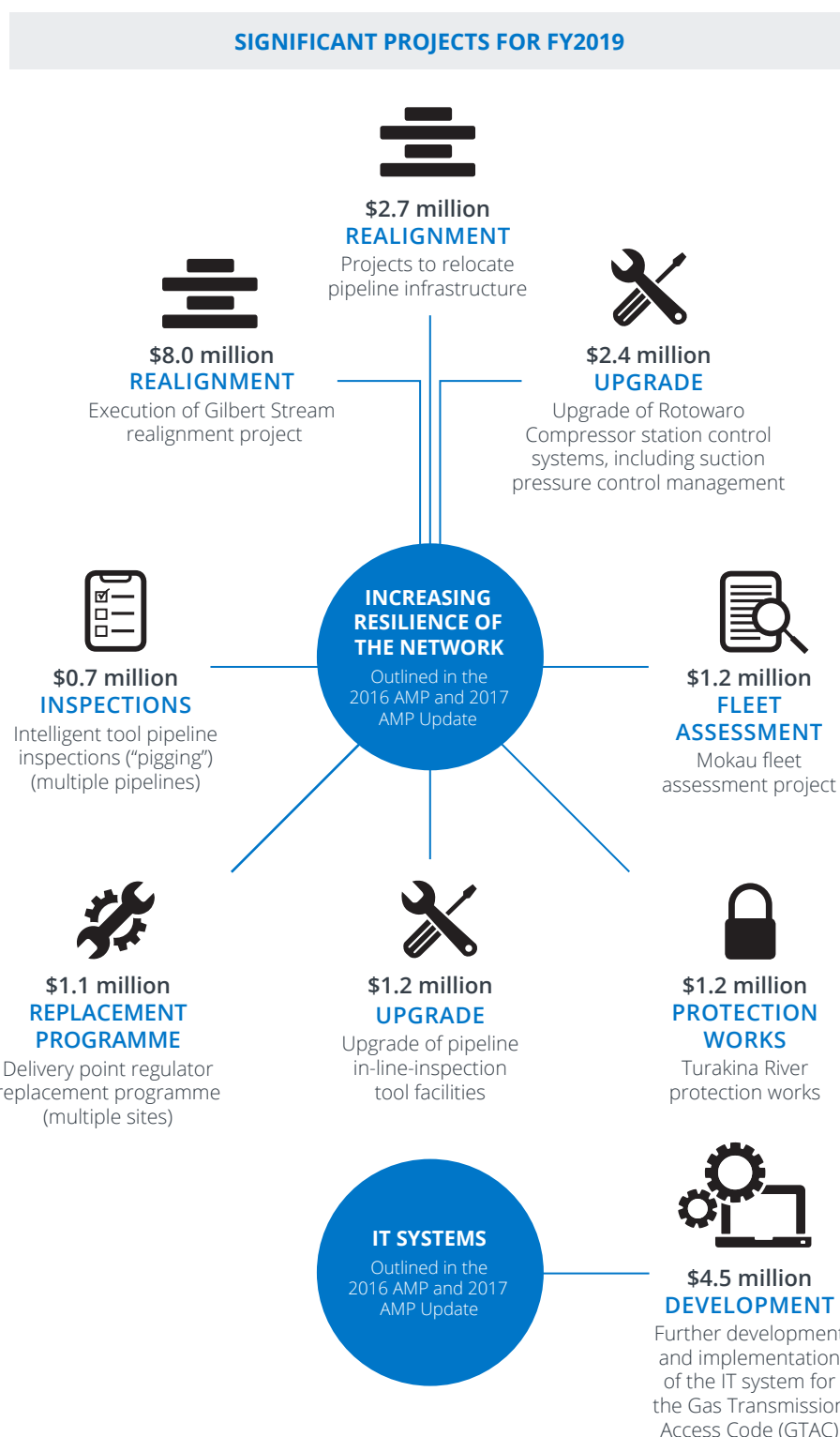
4.1 SIGNIFICANT ACTIVITIES FOR FY2019

Table 3 sets out the major activities we plan to undertake throughout FY2019.

We outline each of these projects below and the location of these significant projects is shown in Figure 11 below (with the exception of the IT GTAC project). These projects represent almost 55% of the overall Capex programme for our gas transmission business for the coming year. Greater detail on all significant projects can be found in [Appendix L](#).

We also provide details on the next stages for the White Cliffs realignment project, continuous work on assessing geohazard risk, and the further work on our Asset Management improvement programme.

Table 3: Significant projects for FY2019



Map Key

- Production Station
- Compressor Station
- Delivery Point
- Delivery Point
- City/Town
- First Gas High Pressure Pipelines
- Maui High Pressure Pipelines

11

We are planning for the bulk of the physical works to be undertaken during the summer of 2018/2019. We do not expect that this work will result in any reductions in transmission capacity or impact on gas deliveries to our customers. Implementation of this project will provide valuable lessons for the larger White Cliffs realignment project, located north of the Gilbert Stream site.

- ▶ The use of drone technology to monitor the cliff face allows us to ensure that the risk is managed while we prepare to carry out the realignment.

Rotowaro compressor station control system upgrade



Rotowaro is a strategic compression site and we are currently undertaking a review of our compression needs in order to meet future demand. A number of key activities are planned for the Rotowaro Compressor station throughout FY2019, including replacement of the inlet pressure control system for the turbine compressors to improve reliability and security of supply. In addition to the pressure control upgrade, we are continuing with a replacement programme for the obsolete pneumatic control systems on the reciprocating compressors. The pneumatic systems are outdated, with new system providing better control and monitoring capabilities and allowing for trending of asset performance.

This activity aligns with the improving the asset condition in Schedule 12a, a big driver on the asset condition is ensuring that we continue with our programme of upgrading the existing control systems.

Upgrades to the Mokau fleet



As part of First Gas' upgrade of its compressor stations, a fleet assessment was conducted on the equipment on site at the Mokau compressor station. There have been a number of findings from this assessment to bring these assets in line with the original equipment manufacturers recommendations. This work will form a package of work to be completed on this site in the coming year.

Upgrades to our pigging facilities



Pipeline pigging is an essential asset management activity. First Gas uses a tool referred to as a 'PIG' (Pipeline-Inspection-Gauge), which is inserted into the pipeline at dedicated launch and receive locations. Pigging of the pipelines allows us to carry out maintenance and inspection activity without stopping the flow of gas.

First Gas has embarked on an initiative to upgrade our pigging facilities to ensure they are aligned with industry good practice. Part of this work involves upgrades to our pigging launchers and receivers.

Our fleet of launchers and receivers currently have varied configurations that reflect what was best practice at the time they were manufactured. We are looking to move to standardised designs for our facilities, taking into account current pigging technologies and configurations.

We have identified a number of sites that will be upgraded in FY2019.

Projects to relocate pipeline infrastructure

We are undertaking two projects to relocate pipelines, following requests from third parties.

Murphys Road bridge realignment

Vista Estate LP are progressing a residential development with associated access ways within an area of land on Murphys Road in Flat Bush, Auckland.

The First Gas Ltd owned and operated DN350 pipeline, '400 Line', is currently in an easement that runs through a large portion of the area for development.

Ports of Auckland

Ports of Auckland Limited (POAL) have purchased a block of land in Te Rapa just North of Hamilton. New Zealand Railways Main Trunk Railway for the North Island runs through this land and POAL plan to turn the purchased land into an inland port.

The land is to be developed to provide both closed and open storage areas mainly for the storage of containers. NZ Rail intend to create three railway sidings off the main trunk line to facilitate access to the storage areas.

The First Gas owned and operated 6 inch 402 line runs through the land that has been purchased. The line is required to be realigned and lowered to allow the POAL works to progress as the depth of cover over the pipeline is not of sufficient depth nor has sufficient protection to allow for the POAL development.

Delivery point regulator replacement programme

As mentioned in section three, a programme of regulator replacement has been under way to replace our fleet of obsolete Grove 80 regulators. We plan to complete this programme within the next two years.

The programme was initiated a number of years ago and we procured sufficient spares to maintain the fleet until the completion of the program. This way we ensure that we are not exposing ourselves to unnecessary risks.

Intelligent pigging

The frequency of our intelligent pigging programme is driven by our Pipeline Integrity Management Plan. Typically for pipelines that transit urban area or are in areas that pose an increased risk, the intelligent pigging will be conducted at five yearly intervals. For pipelines that transit rural areas or are not exposed to elevated potential for risk, the pigging is conducted at ten yearly intervals. For all our piggable pipelines, it is a requirement from our pipeline certifier that we conduct the pigging at our specified intervals to maintain our certificate of fitness.

Through the course of FY2019, we are planning to conduct intelligent pigging on the 600 series pipelines in the southern system, and on the 500 pipeline in the Bay of Plenty system.

Turakina River protection works



River bank erosion has undermined the existing 100 Line pipeline protection structures at the Turakina River. A project to provide a new protection structure is underway.

Ongoing land access issues have rendered the initial (100-year flood event) river bank stabilisation solution non-viable. A revised solution, protecting the pipeline but not stabilising the riverbank erosion has been proposed. This solution is suitable for a 20-year flood event and can be implemented within the existing easement. This solution will be constructed under the existing pipeline resource consents.

White Cliffs re-alignment project



Over the next 12 months, First Gas will continue to monitor the site, and assess how best to design and sequence the realignment works. We will also continue discussions with landowners to secure access to the site.

As outlined in section three, we are now focusing on value engineering the FEED study and will continue with planning the execution phase of the White Cliffs project during FY2022/ FY2023. The execution phase will involve the construction and commissioning of the new pipelines, removal of redundant pipeline sections, reinstatement of worksites and monitoring of remediation over 12 months.

First Gas will continue our discussions with the Commerce Commission in 2018 to discuss the appropriate approach for securing funding for this project. The decision to proceed or not with a CPP application is expected to be made between December 2018 – February 2019, to ensure we have sufficient time to prepare a CPP application.

Addressing geohazard risks on our system

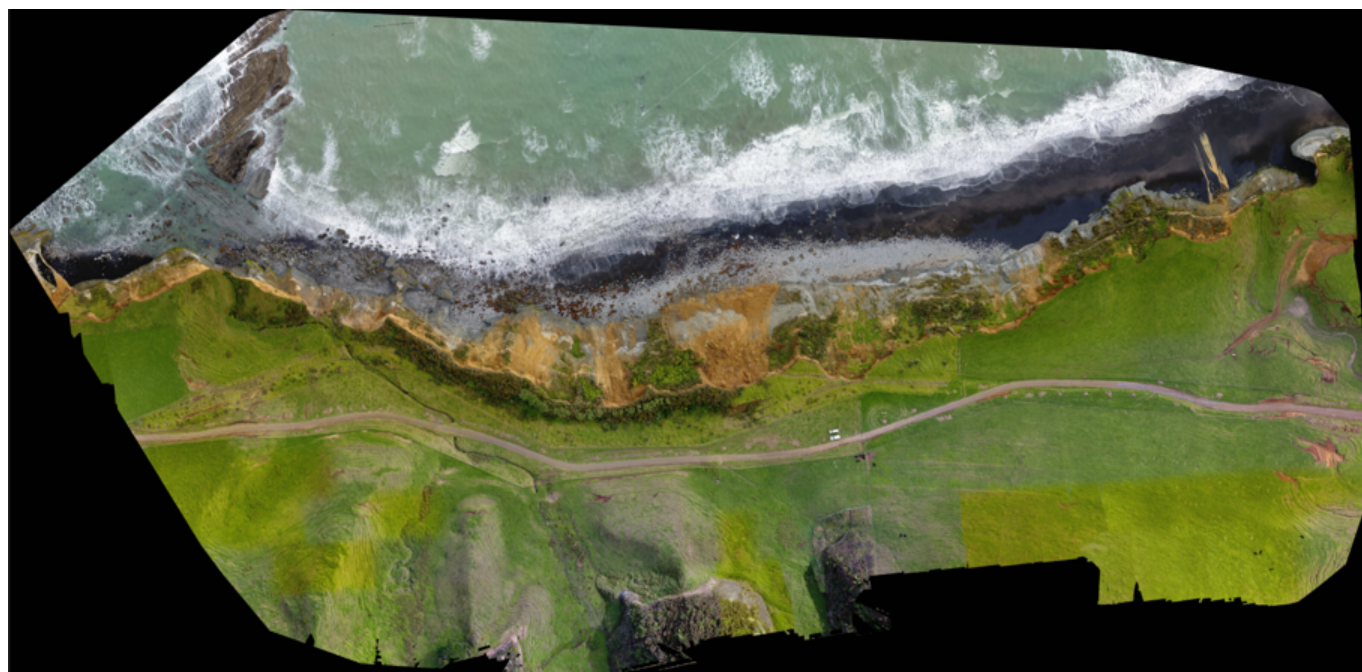
As outlined in section two above and in our 2017 submission on the DPP reset, First Gas has implemented a new programme to better understand and manage geohazard risks on our gas transmission system. This significant programme of work involves:

- Initial reporting of each of the geohazards, assessing each feature for its likely impact to pose a risk to the pipeline.
- Conducting more detailed field assessments, geotechnical assessments, and pipeline integrity impact assessments. This work is aligned with our intelligent pigging reports to gain a more detailed understanding of the specific feature, how active it is and the impact to the pipeline.

Remediation is planned where required, alongside routine monitoring on the feature.

This process of work enables us to ensure that the activities we undertake follow a risk-based approach. In [Appendix C](#), we provide greater detail on the status of our current risks and planned activities for each site.

Figure 13: UAV image monitoring White Cliffs erosion



Asset condition (Schedule 12A)

Schedule 12a (report on asset condition), provides a high-level overview of the asset condition rating as per the Commerce Commission's grading categories.¹⁵ 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.

A summary of the work programmes where we have identified assets as being grade 1 (meaning end of service life, immediate intervention required) include:

- **Compressors** (22.22% are classified as grade 1): A programme is underway to upgrade the existing out-dated pneumatic control systems with current technology and carry out hours-run based major overhauls. This will result in 22% of the assets being replaced in the next five years.
- **Gas fired heaters** (30.28% are classified as grade 1): A refurbishment programme will be ongoing throughout the period. This will result in 30% of the assets being replaced in the next five years.
- **Metering systems** (28% of ultrasonic meters and 54% of rotary meters are classified as grade 1): Meter replacements are an ongoing programme throughout the AMP period. Over the next five years, we anticipate that 10% – 20% of the meters will be replaced. This replacement programme is based on age of the existing meters. Performance will be monitored to ensure that the replacement programme is targeted to the meters where performance issues warrant the replacement.
- **SCADA and communications, remote terminal units** (12.98% are classified as grade 1): A programme to replace the CPU component within the remote terminal unit (RTU) will result in the extension of life of all the RTUs at a significantly reduced cost than replacing the entire RTU. A 100% replacement programme of the CPU component will be undertaken in the next five years.

Further detail on the condition, risks and issues, and planned activities can be found in [Appendix C](#).

Asset Management improvement programme

Our Asset Management Maturity Assessment Tool (AMMAT)¹⁶ gap analysis and other external and internal reviews demonstrate that while First Gas has improved in a number of areas since the last AMMAT in 2016, we still have opportunities for improvement. Our asset management improvement programme going forward includes a number of initiatives aimed at achieving these improvements and optimising the long-term performance of our assets. These initiatives include:

- **Maturing our risk management system and asset health:** As part of our drive to improve the way we use and communicate asset health; First Gas is developing a risk management system that evaluates and compares the different risks that the business is exposed to and translates them into a single risk profile that will provide an overall asset health index.

The asset health index and the asset criticality (an indication of the importance of the asset) are used to provide 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 we believe it is needed to reduce risk and maintain asset reliability. This will allow First Gas to describe how the annual Capex and Opex programmes are influencing the overall asset health to control risk and can describe to customers the potential for these risks to impact overall gas supply.

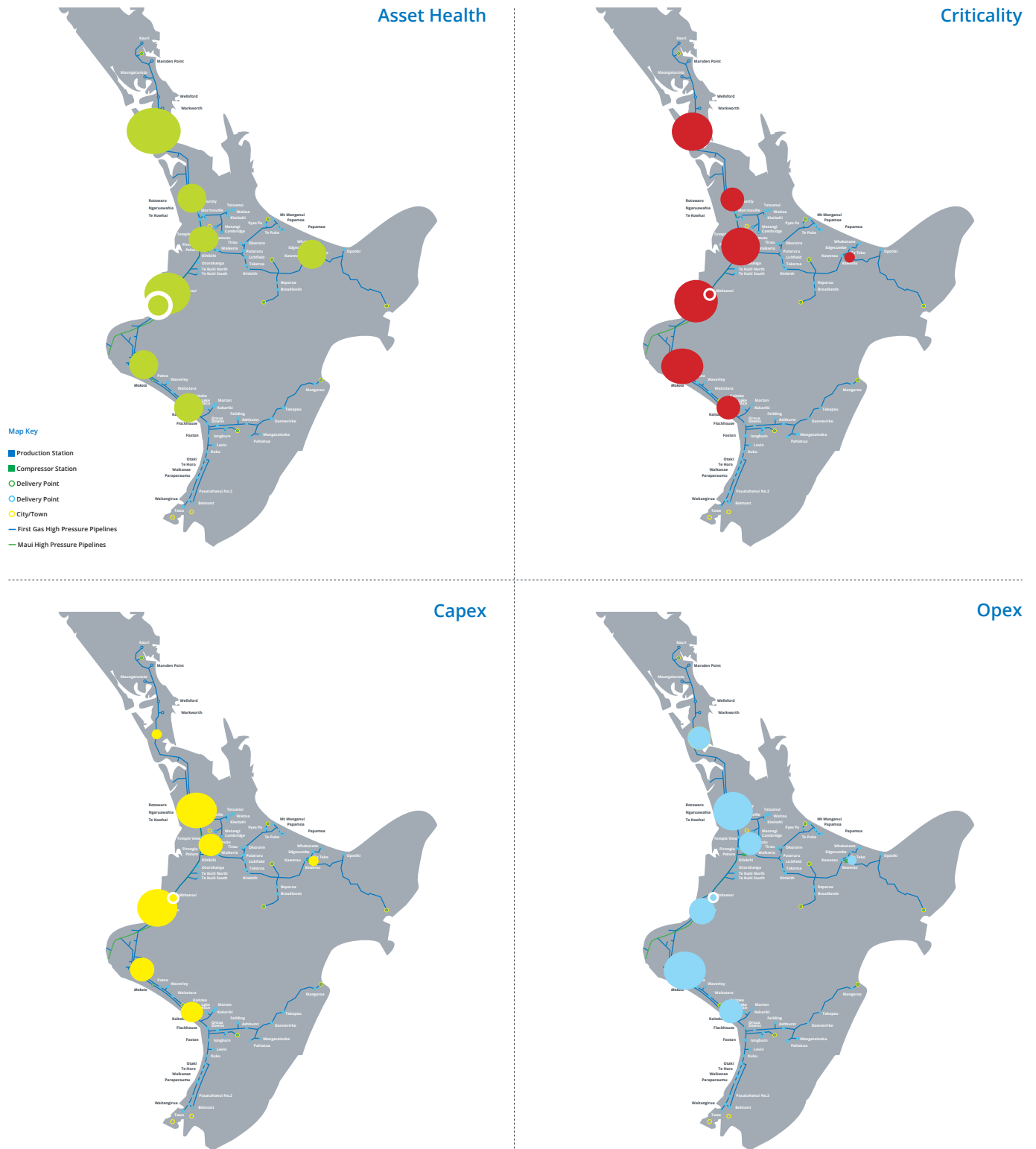
We have developed the framework to calculate the overall asset index by compressor station, which we will review before rolling out to other assets. When we are confident that the overall asset health index is a true representation of asset health, we will look at providing a dynamic dashboard that will ensure we are focusing on continuous improvement and are investing our expenditure in the right areas.

- **Line of Sight:** Reviewing our asset health and criticality information alongside our planned expenditure enables the business to make informed decisions about where expenditure will add the most value to the company. Opex on the asset will be driven by asset criticality – the more critical the asset, the more emphasis will be placed on completing the maintenance activities prescribed. Capex is driven by asset health, ensuring that expenditure is targeted to the right asset to maintain performance levels.

15. When First Gas 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.

16. See Appendix H for further detail.

Figure 14: Area dashboard 9



– **Embedding and evolving the Asset Management system:**

We intend to embed and further develop our overall asset management framework, asset management system elements, and ensure our documentation more closely aligns with *ISO 55000* (Asset Management Standards). Key elements of this system include:

- Asset Management Plans
- Capital expenditure
- Maintenance optimisation
- Asset risk
- Planning and scheduling
- Project management

– **Roll out of the maintenance optimisation programme:**

Over the coming year, we will expand this programme to all compressor and odorant stations. We will also develop technology to monitor, collect and collate asset data.

- **Optimising project management reporting:** We are implementing a new suite of software systems to improve our project management reporting, control and monitoring. This will provide greater visibility over current projects, greater cost control and improved monitoring with near-time information. An example of the portfolio summary being developed under project management is provided in Figure 15.

Figure 15: Project Server Dashboard



5. EXPENDITURE FORECASTS

As First Gas is improving on our asset management approaches and systems, we are gaining a greater understanding of our risk profile and where we need to allocate our funding. Over the last 12 months, we have had a critical review on our expenditure and delivery forecasts of our capital works plan. Subsequently, we have made some adjustments to our planned expenditure profiles to create a more stable expenditure profile and allow for better resource planning over the remaining years of the DPP period.

5.1 CAPEX FORECAST

Our forecast Capex spend over the next ten years is set out in Figure 16.

The increased level of Capex investment forecast for FY2019 can be attributed to:

- The implementation of the new IT system to support the new code (GTAC), at a projected cost of \$4.5 million.
- The execution of the Gilbert Stream realignment project, at a cost of \$8.0 million.

The re-phasing of expenditure for the remainder of the DPP period will allow for better resource planning, and project execution. It will also enable us to deliver the total level of Capex forecast for this DPP period.

5.2 OPEX FORECAST

The forecast Opex over the next planning period is set out in Figure 17. There is no significant change in ongoing Opex from that set out in 2017 AMP Update.

The reduction in OPEX for FY2018 has been the result of one-off savings and efficiency improvements in the business. For FY2019, we will be undertaking a review of the Opex activities and looking for opportunities for additional savings.

Figure 16: Forecast total Capex (all figures in FY2018 prices)

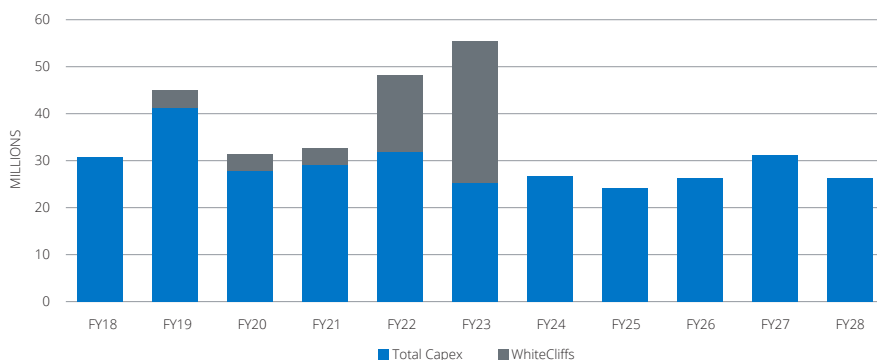
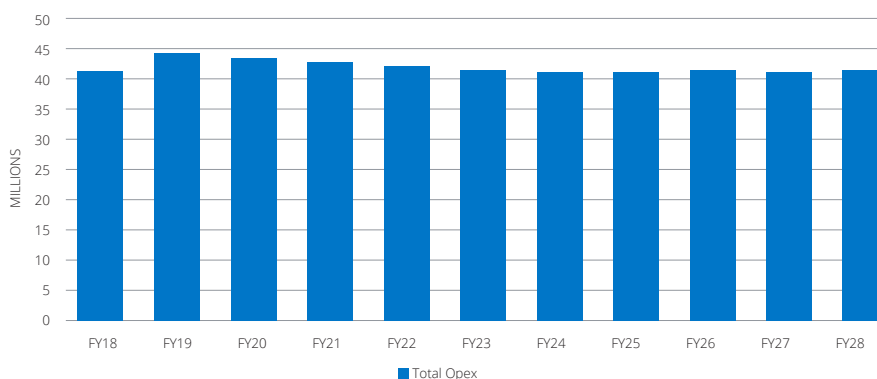


Figure 17: Forecast total Opex (all figures in FY2018 prices)



6. STAKEHOLDER ENGAGEMENT

First Gas recognises the importance of regular engagement with our major gas users and customers who rely on the consistent and safe delivery of large volumes of gas to maintain their ongoing productivity and business. Throughout the year, we have focused on maintaining regular dialogue with our stakeholders and sought out timely feedback, to improve the transmission services we provide across our system.

6.1 ENGAGING WITH THE GAS INDUSTRY

The development of the single Gas Transmission Access Code (GTAC) has been a key focus of our stakeholder engagement over recent months. We have held a number of structured workshops to seek feedback on the draft code, to discuss the draft and final recommendations from the GIC, and to discuss a targeted work programme going forward. We have also held meetings with individual shippers to get a more thorough understanding of their views. We have welcomed the openness of our stakeholders to engage on this project and shape a path forward.

First Gas has continued to regularly attend major gas user group (MGUG) briefings to share our detailed operational plans, over and above that set out in our AMPs. We have also met more regularly with our large gas users, to better understand their businesses and how we can assist them.

We ensure we have regular engagement with the upstream gas producers. Over the last year, we met with producers to view a demonstration of compliance with gas quality standards. Producers verified that they meet gas specifications and discussed with First Gas the systems they have in place to monitor this. First Gas also discussed progress on the GTAC with producers, and how this impacts their sector. First Gas has also increased our engagement with EmsTradePoint, the whole gas market operator. We regularly contribute to their operations working group, which helps us understand how shipping affects the competitiveness of New Zealand gas market.

Looking forward, we have also started discussions with stakeholders around the future use of our pipelines. We have begun discussions with staff from the Ministry of Business, Innovation and Employment (MBIE) and Callaghan Institute about the possible role of hydrogen in New Zealand.

6.2 LAND AND PLANNING STAKEHOLDER MANAGEMENT

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

- Influencing the national policy and council plans that influences and affects operation of our assets. We are taking part in a National Planning Standard working group alongside other utility providers.

- Updating and reviewing our current communication channels. We are now producing multi-language communication material, updating our public website, and developing more information aids such as a Developer Guide, HSE guides for farmers, biosecurity policy and standards, and a council guide. Going forward, we are also investigating new marketing techniques that will help us better engage with our customers and land owners.
- Interacting more with the field operations teams, to ensure we are continually improving how we work so that our customers are receiving the best level of service.
- Providing clarity and documented standards around Pipeline Easement Management. We are also improving the unauthorised activity management process, and the time and quality of responses.
- Embedding and developing a new land data management system that helps manage and record all interactions with our stakeholders and provide information access in the field.

Managing conflicting interest

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

From 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 transmission operating codes (which include obligations relating to confidentiality) and we need to comply with the Health and Safety in Employment (Pipelines) Regulations 1999 and other relevant legislation.
- Seeking solutions that are consistent with the principles found in the codes and in relevant legislation or regulation.
- Communicating effectively with stakeholders so that all parties know where they stand.

In all instances of conflicting interests, we will strive to engage with stakeholders in a transparent manner to explain our decisions.

