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Trends in gas pipeline business performance

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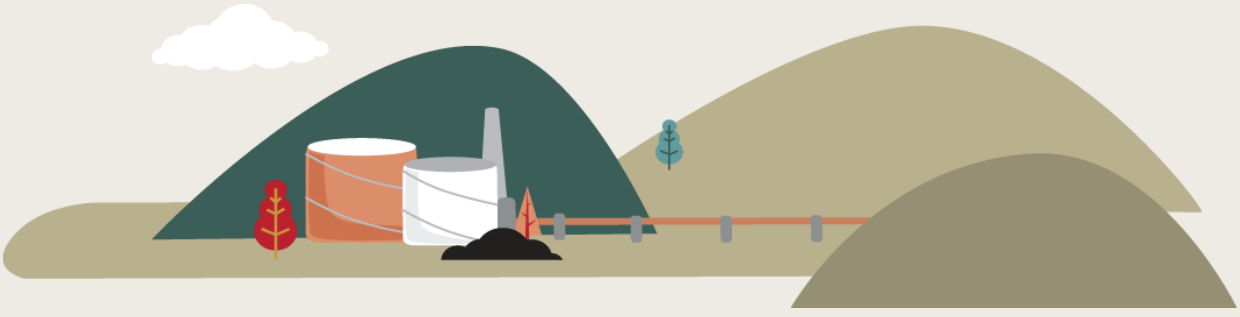


Contents

Executive summary

Purpose of the report

X1. The purpose of this report is to help people understand the drivers for change in the price and quality of services provided by gas distribution (hereafter referred to as local gas pipeline) and gas transmission businesses (collectively, gas pipeline businesses) over time.

X2. The aim of providing insights into gas pipeline business activities and issues is to promote greater understanding of the performance of gas pipeline businesses, their relative performance, and any changes in performance over time. We are required to summarise and analyse information that gas pipeline businesses disclose to us under Part 4 of the Commerce Act 1986 (the **Act**).

X3. While this report identifies and explores trends in gas pipeline businesses' revenue, expenditure and reliability, it does not make conclusions about whether changes over time constitute 'poor' or 'strong' performance. The specific context and operating conditions of each gas pipeline business is important to understanding how 'good' their performance is, which requires detailed, company-specific analysis.

X4. Further information on our responsibilities under the Act is provided in the 'Approach to trend analysis of gas pipeline businesses' paper which accompanies this report.

X5. The energy sector is in a period of change and uncertainty, and the pace of change may accelerate. This will have implications for the infrastructure owned by gas pipeline businesses, and the regulatory regime they operate under. We note however that this report is backwards looking, with the intention of tracking change over time and allowing trends in local gas pipeline and gas transmission pipeline use and investment to be observed.

The analysis within this report will be of interest to stakeholders including gas customers, and we welcome your feedback

X6. We expect that this analysis will be of interest to all stakeholders in the gas industry. It is intended to aid customers in determining whether the prices that they pay for gas pipeline business services, and the quality of the services they receive, reflect an industry that works efficiently and to their long-term benefit.

X7. We intend to update this report and the accompanying fact sheet and interactive online dashboard regularly, with relevant analysis and insights when new data becomes available. This is the second iteration of this report, the first of which was published in December 2021. This current version of the report has been updated with data from 2021 information disclosures. We welcome feedback to help improve the depth and quality of our insights in future analysis.[1]

[1] We can be contacted by email: infrastructure.regulation@comcom.govt.nz

X8. Throughout this report we make reference to the higher inflation experienced in the 2021 year. The impact in general is as follows: high inflation experienced would have negatively impacted gas pipeline businesses' returns due to higher input costs. This would have been largely offset by CPI-driven increases in actual allowable revenue, and gas pipeline businesses would also have benefited from higher revaluations to their regulated asset base. However, the use of a lagged CPI index to set revenue would have led to timing differences between the increased costs incurred and increased revenue collected, resulting in a net unfavourable impact on returns during the current default price-quality path (**DPP**) period.

The structure of this report

X9. Following this executive summary, the report is structured as follows:

X9.1 Chapter 1 – an introduction to the report, including an overview of our role in regulating gas pipeline businesses;

X9.2 Chapter 2 – on local gas pipeline business performance, beginning with an overview of local gas pipeline businesses;

X9.3 Chapter 3 – on gas transmission business performance, beginning with an overview of gas transmission; and

X9.4 Appendix A – a glossary of abbreviated terms used within the report.

X10. A summary of our analysis of the performance of local gas pipeline businesses, detailed within chapter 2, is provided below. This is followed by a summary of our analysis of the performance of gas transmission businesses, detailed in chapter 3.

Summary of the performance of local gas pipeline businesses

X11. The annual revenue that local gas pipeline businesses have collected through providing regulated services has increased by $5m since 2014, to $135m. Growth in the number of customers connected, primarily new residential and small business customers, has led to all customers on average paying $443 per year, which is $36 less in nominal terms than they did in 2014. Once general price inflation is accounted for, local gas pipeline business revenues have fallen by $99 per customer on average in real terms since 2014.

X12. 33% and 27% of local gas pipeline business revenues went toward operating expenditure (**opex**) and depreciation respectively in 2021. Depreciation and opex have increased by 6% and 4% per year on average respectively since 2014, resulting in customers on average paying $120 and $146 for each in 2021, $29 and $23 more per year than in 2014.

X13. Profit has declined following the 2017 DPP reset.[2] The average profit per customer was $113 in 2021, $77 less than the average profit per customer in 2014. The rates of return for local gas pipeline businesses were generally in line with our estimates of their reasonable rate of

[2] More information on the DPP reset can be found on the Commission's website.

return adjusted for ex-post inflation, suggesting that they have generally not made excessive profits over the last eight years.

X14. The annual capital expenditure of local gas pipeline businesses was 45% higher in 2021 than in 2014. The increase in the value of the regulated asset base as a result of network and non-network capital expenditure has led to steady increases in depreciation. The regulated asset base (upon which the total return on assets is based) of all local gas pipeline businesses collectively was valued at over $1b in 2021, an increase of $234m (28%) since 2014.

X15. The total number of outages, and the average duration and frequency of outages experienced by customers of local gas pipeline businesses have generally decreased since 2014, with the exception of Powerco, due to planned outages for replacement works of pre-1985 pipes during 2021. The number of emergencies experienced by customers, and the number of complaints made by customers has also decreased significantly.

Summary of the performance of gas transmission businesses

X16. Gas transmission businesses' regulated revenue has remained relatively stable at around $131m in 2021, decreasing by $1.9m in nominal terms since 2014. After accounting for general price inflation, gas transmission revenues have fallen by $15m since 2014. The volume of gas delivered via transmission pipelines has also decreased since 2014.

X17. Opex and depreciation comprised 48% and 26% of gas transmission revenues respectively in 2021. Opex has increased by $22m in nominal terms, or 7% per year on average since 2014. While depreciation is a smaller component of gas transmission businesses' revenue, it has increased at a faster rate between 2014 and 2021, by $1m or 8% per year on average.

X18. Overall, the profit earned by gas transmission businesses has decreased from $48m by $4.9m or 16% per year on average between 2014 and 2021. Their rates of return were generally in line with our estimates of a reasonable rate of return adjusted for ex-post inflation, suggesting that they have generally not made excessive profits over the last eight years.

X19. In 2021, gas transmission businesses' capital expenditure was $7m or 29% lower than in 2014, with the decrease in capex in 2021 being attributable to the discontinuation of the gas transmission access code project (**GTAC**). Growth in network and non-network assets has led to depreciation increasing by $7.9m since 2014. The regulated asset base of First Gas Transmission (upon which their total return on assets is based) was valued at $874.5m in 2021, an increase of $82m (10%) since 2014.

X20. We expect interruptions to gas transmission services to be infrequent and brief, and this was the case between 2014 and 2021. Beyond outage and network integrity measures, we collect metrics on compressor unit availability and utilisation, which have generally improved since 2014.

Chapter 1 – Introduction

Purpose of the report

1. The purpose of this report is to help people understand the drivers for change in the price and quality of services provided by regulated gas distribution and gas transmission businesses (collectively, gas pipeline businesses) between 2014 and 2021.

    1.1 For this analysis, we use data from 2014 to 2021, for years ending 30 September.[3] We exclude 2012 and 2013 as both years lack data at the granularity required for some categories.

2. The aim of providing insight into regulated gas pipeline business activities and issues is to promote greater understanding of the performance of regulated gas pipeline businesses, their relative performance, and any changes in performance over time to help inform assessment of how the purpose of the regulatory regime under Part 4 of the Commerce Act 1986 (the **Act**) is being met.[4]

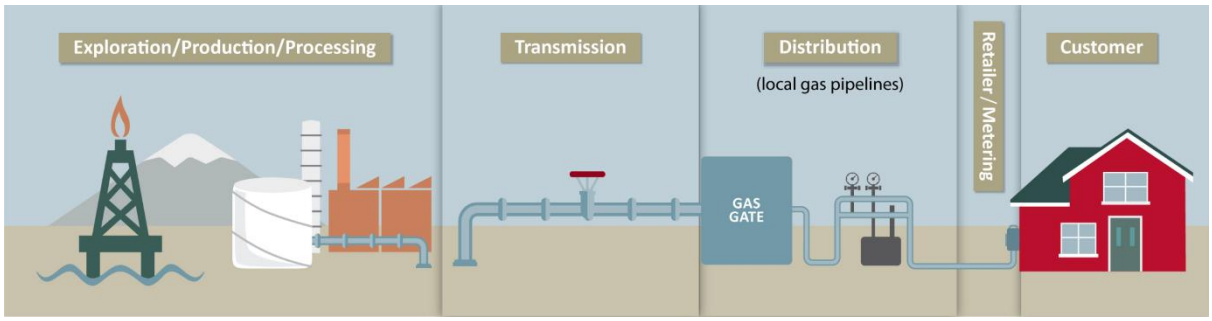
The gas industry features many participants with different roles in gas production, transport, and consumption

3. The production of natural gas for use by consumers begins with exploration, extraction, and processing. Conventional gas producers located around Taranaki process gas for general use, and then the gas is injected into high-pressure transmission pipelines that stretch throughout the North Island. Large gas consumers (eg, Methanex, Huntly power station) may connect to the transmission system directly, while local gas pipeline businesses (ie, GasNet, First Gas, Powerco, Vector) transport gas from the high-pressure transmission system through to homes and businesses.

4. Wholesalers buy gas from gas producers, and on-sell it to gas retailers or directly to customers. Large customers may also buy directly from gas producers; in New Zealand, most of the natural gas consumed is by large industrial customers, with gas production contracted to these customers under long-term arrangements. Gas retailers contract directly with the gas transmission business, local gas pipeline businesses and gas metering providers to arrange for transport of the gas through to smaller commercial customers, small businesses and households.

[3] Not all gas pipeline businesses provide data for years ending on 30 September. GasNet and Vector provide their information disclosures for years ending 30 June, while Powerco and First Gas provide information disclosures for years ending 30 September. Our treatment of the time differences is described in further detail in the 'Approach to trend analysis of gas pipeline businesses' paper which accompanies this report.
[4] Commerce Act 1986, s 52A.

Figure 1: Various elements of the natural gas supply chain



5. Each local gas pipeline business operates in different regions:

   5.1 Vector: Auckland

   5.2 Powerco: Wellington, Hutt Valley and Porirua, Taranaki, Manawatu and Horowhenua, and Hawkes Bay

   5.3 First Gas: Northland, Waikato, the Central Plateau, Bay of Plenty, Gisborne, and Kapiti Coast

   5.4 GasNet: Whanganui, Marton, Bulls, Flockhouse, and Waitotara.

6. First Gas acquired its Northland, Waikato, Central Plateau, Bay of Plenty, Gisborne, and Kapiti Coast local gas network assets from Vector in 2016, and separately in 2016 acquired further Bay of Plenty network assets from GasNet.

7. The high-pressure transmission system owned by First Gas is comprised of two pipeline systems which interconnect with one another:

   7.1 one between Taranaki and Huntly, historically known as the Maui pipeline; and

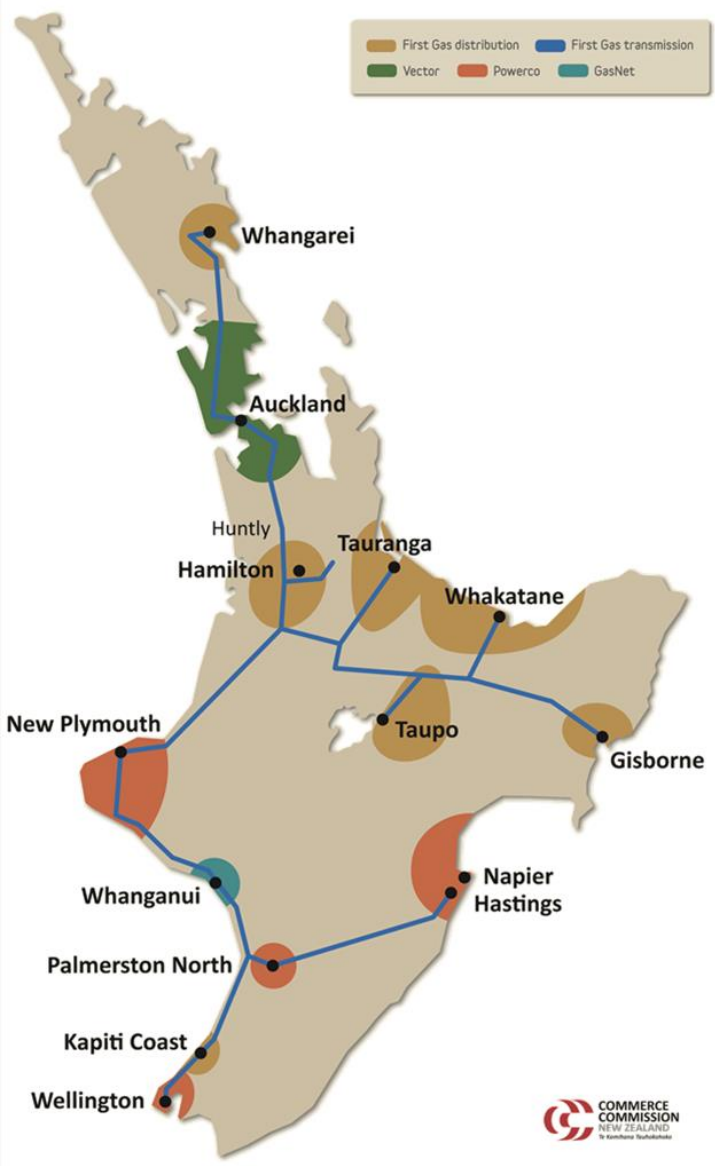
   7.2 the other system stretching from Taranaki throughout the North Island – as far as Northland, Gisborne and Wellington.

8. First Gas acquired these two transmission pipeline systems in 2016: the pipeline between Taranaki and Huntly from Maui Development Limited (**MDL**), and the remaining pipelines from Vector. For the purpose of this analysis, we do not report on each gas transmission pipeline separately. Therefore, any reference to "gas transmission businesses" may refer to either MDL and Vector, to First Gas alone, or to all three businesses.

9. First Gas owns local gas pipelines and the transmission pipeline systems – so while 'First Gas Distribution' and 'First Gas Transmission' are part of the same company, the information regime described in paragraph 12 requires separate disclosures. The information disclosure requirements differ between local and transmission pipelines, and therefore so does the data that is disclosed.

10. Figure 2 shows the locations of the various local gas networks in the North Island, as well as the location of the gas transmission system.

Figure 2: Location of the various local gas networks and gas transmission system in the North Island



The regulatory framework that governs the gas market includes several regulators, including the Commerce Commission

11. Under Part 4 of the Act, we are responsible for regulating the gas pipeline services provided by four local gas pipeline businesses (Vector, Powerco, GasNet and First Gas) and the gas transmission business, First Gas.[5]

[5] Not all local nor transmission gas pipelines are regulated eg, Nova Energy, a subsidiary of the Todd Corporation, owns non-open access local networks and gas transmission pipelines which are not subject to regulation under Part 4.

12. The intent of Part 4 of the Act, in the context of the gas industry, is to ensure regulated gas pipeline businesses have incentives to invest and innovate in their networks, improve efficiency, and provide services at a quality that reflects consumer demands, while preventing them from making excessive profits. We apply two types of regulation to these gas pipeline businesses:

    12.1 price-quality (**PQ**) path regulation, where we set the revenue each business can charge to gas consumers and the minimum quality standards they must maintain; and

    12.2 information disclosure (**ID**) regulation, which requires gas pipeline businesses to publish information (publicly) each year detailing their performance, including pricing, future expenditure forecasts, outages and interruptions, and financial statements.

13. Under Part 4, we are required to summarise and analyse any information that gas pipeline businesses disclose under our ID requirements, for the purpose of promoting greater understanding of the performance of individual businesses, how they are performing compared to each other and any changes over time.[6]

    13.1 Gas pipeline businesses have been subject to the current ID regime under Part 4 of the Act since 2012, with slight variations in ID schedule requirements over time.[7]

    13.2 While this report identifies and explores trends in gas pipeline businesses' revenue, expenditure and reliability, it does not make conclusions as to whether changes over time constitute 'poor' or 'strong' performance. The specific context and operating conditions of each gas pipeline business is important to understanding how 'good' their performance is, which requires detailed, company-specific analysis.

14. Further information on our responsibilities under the Act is provided in the 'Approach to trend analysis of gas pipeline businesses' paper which accompanies this report.

15. Other regulatory agencies also have responsibilities in the gas industry. The Gas Industry Company (**GIC**) is the industry's co-regulator, established under the Gas Act 1992 (the **Gas Act**). It is responsible for administering governance arrangements for the downstream gas industry (from processing through to retail). The Ministry of Business, Innovation and Employment (**MBIE**) has a central role in governing, monitoring and advising on the wider gas market, and assessing recommendations made by the GIC. At an operational level, WorkSafe is responsible for monitoring and enforcing safety standards set out in the Gas Act (or within regulations made under the Gas Act).

[6] Commerce Act 1986, s 53B(2)(b). Additionally, s 53B(3) provides that, as part of that summary and analysis, we may include an analysis of how effective the ID requirements imposed on the services are in promoting the purpose of Part 4.

[7] Gas pipeline businesses were subject to an ID regime under the Gas (Information Disclosure) Regulations 1997 until it was replaced by the introduction of Part 4 ID regulation through the Commerce Amendment Act 2008. The previous ID regime was substantially different and focussed primarily on financial statements.

The analysis within this report will be of interest to stakeholders including gas customers

16. We use the term 'customers' to mean the entities connected to a local gas pipeline business, which can be households or businesses, or to mean industrial consumers that are connected directly to the transmission network. We do not consider gas shippers (including gas retailers) to be customers for the purpose of this report.

17. In general, most customers do not have a direct relationship with their local gas pipeline business nor the gas transmission business. Instead, they engage with a gas retailer to which they pay their bill, and the retailer passes through a portion of this bill (historically this has been roughly 40-45%) to pay for the services of the local gas pipeline business and the gas transmission business.

18. We expect that this analysis will be of interest to all stakeholders in the gas industry. It is intended to aid customers in determining whether the prices they pay for gas pipeline business services, and the quality of the services they receive, are reflective of an industry that works efficiently and to their long-term benefit.[8] This analysis will also be an important input into our assessments of the performance of gas pipeline businesses, and the effectiveness of our regulatory regime.

The operating environment of the gas industry is changing and increasingly uncertain

19. The energy sector is in a period of change and uncertainty, and the pace of change may accelerate.[9] He Pou a Rangi, the Climate Change Commission (**CCC**), has released its final advice which suggests that the role of natural gas will diminish over time as decarbonisation efforts progress, and that consequences for network infrastructure will need to be considered.[10] In response to the CCC's report, the Government did not agree with the CCC's recommendation to ban new gas connections, however, there continues to be significant uncertainty around the future of natural gas.[11]

20. MBIE is currently developing a gas transition plan and an energy strategy. The plan "will focus on actions through to 2035 for the fossil gas sector to reduce emissions, and support the transition to a net zero carbon economy by 2050".[12] In terms of New Zealand's energy strategy, the Government has "committed to reaching net zero for long-lived gases by 2050,

[8] We do not assess specific prices to particular customer groups but assess prices on average.
[9] Commerce Commission "Open letter—ensuring our energy and airports regulation is fit for purpose" (29 April 2021), page 2
[10] He Pou a Rangi Climate Change Commission, "Ināia tonu nei: a low emissions future for Aotearoa", page 277
[11] Ministry for the Environment, "Aotearoa New Zealand's first emissions reduction plan: The Government's response to He Pou a Rangi – Climate Change Commission's recommendations", page 40
[12] Ministry of Business, Innovation and Employment, https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/gas-transition-plan (viewed on 16 January 2023)

set a target that 50% of total energy consumption will come from renewable sources by 2035, and has an aspirational target of 100% renewable electricity by 2030."[13]

21. If production volumes and consumption of natural gas decreased in the long term, there would be flow-on effects for local gas pipelines and gas transmission pipelines, as it means that the recovery of investment will need to be spread across fewer users.[14] Local gas pipeline businesses have experienced customer connection and volume growth in the past, but they and the regulatory regime they operate under may need to adapt to a decline in gas consumption in the future.

22. If alternative gases produced from renewable sources (eg, biogas, green hydrogen) end up playing a large role in decarbonising New Zealand's economy, gas pipelines could continue to be used for transport services. The GIC noted in its Gas Market Settings Investigation Consultation Paper that "the existing gas transmission and distribution infrastructure will be a critical component to supplying reticulated 'green' gases in future".[15]

23. We note that this report is backwards looking, with the intention of tracking change over time and allowing observation of trends in local gas pipeline and gas transmission pipeline use and investment.

We have published other summary materials alongside this report

24. We intend to update this report regularly with relevant analysis and insights when new data becomes available. This is the second iteration of the report, the first of which was published in December 2021. This current version of the report has been updated with data from 2021 information disclosures. We welcome feedback to help improve the depth and quality of our insights in future analysis.

25. This report is supported by materials that highlight our key findings and allow stakeholders to interrogate the data behind them. The range of material allows stakeholders easy access to the information at various levels of interest. It includes:

    25.1 a paper titled 'Approach to trend analysis of gas pipeline businesses' (**Approach paper**), which describes the technical aspects of the analytical approaches we have used, and the legislative context in which we undertook this analysis;

    25.2 a fact sheet highlighting the key findings of our analysis; and

    25.3 an interactive online dashboard that describes the key findings of our analysis and allows users to drill further into the detail if they wish.

[13] Ministry of Business, Innovation and Employment, https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/new-zealand-energy-strategy/ (viewed on 16 January 2023)
[14] Gas Industry Company "Gas Market Settings Investigation Consultation Paper", page 40
[15] Ibid, page 19

This report and the supporting materials add to our existing suite of summaries and analysis

26. The analysis presented in this report and supporting materials contribute to an existing suite of summary and analysis of ID data that can be found on our website.[16]

27. We publish and update the following range of summaries and analysis on a regular basis:

    27.1 a database of the ID data, which groups the raw data disclosed by each local gas pipeline business and gas transmission business into two manipulatable repositories in Microsoft Excel;[17] and

    27.2 annual one-page performance summaries, which provide high-level statistics on each local gas pipeline business' performance, including revenues, expenditure, asset condition and system reliability.[18]

28. We have also previously commissioned external reviews of asset management practices, to encourage gas pipeline businesses to manage their assets to meet consumer demands in the future. We have published external reports:

    28.1 In 2015, reviewing local gas pipeline businesses' asset management plans (**AMP**s) which describe their future investment and maintenance planning.[19]

    28.2 In 2019, assessing local gas pipeline businesses' risk management practices, to aid investigation into how effectively and efficiently they are supplying regulated services.[20]

    28.3 In 2019, assessing First Gas' geotechnical risk management for their gas transmission assets, to determine how well they had assessed, documented and managed geotechnical risk and geohazards affecting their gas transmission pipelines.[21]

29. In May 2022 we published the default price quality path (**DPP**) effective from 1 October 2022 to 30 September 2026. This follows the 2017-2022 gas DPP, for which a range of analysis and modelling was also undertaken.[22] In the Gas Trends report published in the prior year, we

[16] See https://comcom.govt.nz/regulated-industries/gas-pipelines/gas-pipelines-performance-and-data
[17] See https://comcom.govt.nz/regulated-industries/gas-pipelines/gas-pipelines-performance-and-data/information-disclosed-by-gas-pipeline-businesses
[18] See https://comcom.govt.nz/regulated-industries/gas-pipelines/gas-pipelines-performance-and-data/performance-summaries-for-gas-distributors
[19] See https://comcom.govt.nz/regulated-industries/gas-pipelines/gas-pipelines-performance-and-data/summary-and-analysis-of-information-disclosed-by-gas-pipeline-businesses/review-of-asset-management-plans
[20] See 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
[21] See https://comcom.govt.nz/regulated-industries/gas-pipelines/gas-pipelines-performance-and-data/summary-and-analysis-of-information-disclosed-by-gas-pipeline-businesses/geotechnical-risk-management-review-of-first-gas-transmission-pipelines
[22] See https://comcom.govt.nz/regulated-industries/gas-pipelines/gas-pipelines-price-quality-paths/gas-pipelines-default-price-quality-path/2022-2027-gas-default-price-quality-path

mentioned that we were planning to provide an analysis of gas profitability for both gas distribution and gas transmission businesses in 2022. We did not complete this analysis in 2022 due to other work priorities

30. Further background about New Zealand's gas industry can be found on the GIC website's 'about' page.[23] MBIE's 'Gas statistic page' also provides information about New Zealand's gas infrastructure and industry governance.[24]

[23] See https://www.gasindustry.co.nz/about/about-the-industry/
[24] See https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/gas-statistics/

Chapter 2 – Performance of local gas pipeline businesses (Gas distribution)

Purpose of this chapter

31. The purpose of this chapter is to provide an overview of local gas pipeline businesses and the results of our analysis of their performance, including trends in businesses' revenue and costs and the quality of the regulated services they provide. The aim is to give insight into issues that have affected local gas pipeline businesses in recent years, and the underlying drivers of the trends or anomalies observed where possible.

32. Trends are first examined from a high-level industry view, in most cases followed by detailed examination at the individual company level. The key findings are based on industry-wide or company averages, so do not describe differences in the experiences of *individual* customers, as the averages cover all customers (from small residential customers to large industrial customers) across all regional networks.

33. Except where we refer to single-year figures, or state that a figure is an absolute increase in dollars or dollars-per-customer, our analysis refers to the growth implied by the trend – for the reasons explained in the Approach paper regarding our use of trend analysis.

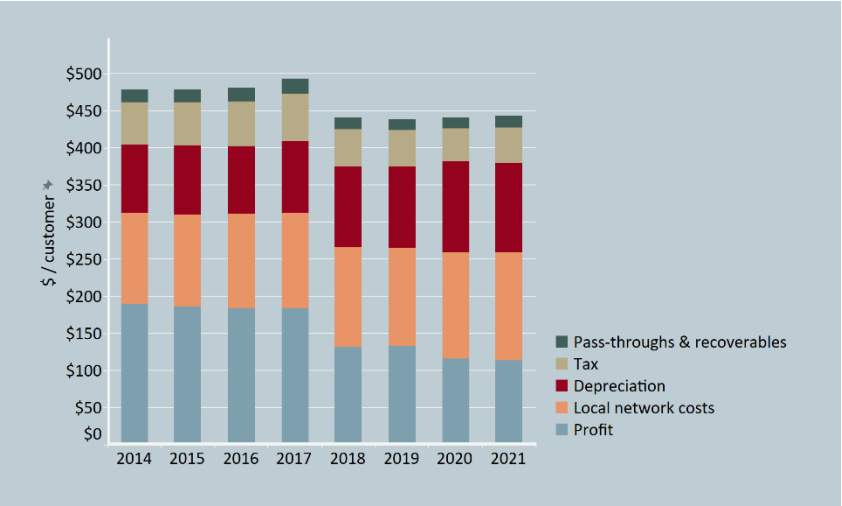
34. Further, unless otherwise stated, the charts and figures for monetary data are given in nominal terms – ie, they have not been adjusted to exclude the impact of inflation.

Key findings

35. The annual revenue that local gas pipeline businesses have collected through providing regulated services has increased by $5m since 2014, to $135m. Growth in the number of customers connected, primarily new residential and small business customers, has led to all customers on average paying $443 per year, which is $36 less in nominal terms than they did in 2014. Once general price inflation is accounted for, local gas pipeline business revenues have fallen by $99 per customer on average in real terms since 2014.

36. Figure 3 shows the breakdown of what the average revenue per customer has recovered between 2014 and 2021.

Figure 3: Breakdown of local gas pipeline business revenue per customer, 2014-2021



37. 33% and 27% of local gas pipeline business revenues went toward operating expenditure (**opex**) and depreciation respectively in 2021. Depreciation and opex have increased by 6% and 4% per year on average respectively since 2014, resulting in customers on average paying $120 and $146 for each in 2021, $29 and $23 more per year than in 2014.

38. Profit has declined following the 2017 DPP reset. In 2021, the average profit per customer was $113, $77 less than the average profit per customer in 2014. The rates of return for local gas pipeline businesses were generally in line with our estimates of their reasonable rate of return adjusted for ex-post inflation, suggesting that they have generally not made excessive profits over the last eight years.

39. The annual capital expenditure (**capex**) of local gas pipeline businesses was 45% higher in 2021 than in 2014. The increase in the regulated asset base (**RAB**) as a result of network and non-network capex has led to steady increases in depreciation. The RAB (upon which the total return on assets is based) of all local gas pipeline businesses collectively was valued at over $1b in 2021, an increase of $234m (28%) since 2014.

40. Investment in local gas pipeline networks has been focussed on supporting growth on networks and maintaining assets. Investment in new connections and system growth has increased by $17m since 2014, while investment in maintaining assets has been consistent over time.

41. Network relocation and capitalised financing costs form a comparatively small portion of capex, but network relocation capex has a high degree of consumer visibility as these costs are often offset partially by capital contributions from the consumers who seek relocation. Consumers also make contributions toward the capital cost of new connections. On a per-customer basis since 2014, capital contributions have increased from $813 by $489 in nominal terms or 60%.

42. The cost of running all local gas pipeline businesses has averaged $38m per year between 2014 and 2021. In 2021, the cost of running local gas pipeline businesses had collectively

increased by $10m since 2014, to $43m. Business support costs have grown by $4m or 33% since 2014, to $17m in 2021 – the largest opex cost across local gas pipeline businesses in 2021. Albeit a relatively small component of opex, the cost of responding to interruptions and emergencies for each local gas pipeline business has been increasing since 2014, with 2021 on par with 2020 at $6m.

43. The quality of service metrics that we collect for local gas pipelines have generally been improving over time. Local gas pipeline businesses have been the predominant source of their planned and unplanned outages, and the total number of outages occurring across all local gas pipeline networks has decreased since 2014. The number of emergencies experienced by customers, and the number of complaints made by customers have also decreased significantly. The average duration and frequency of outages experienced by customers of local gas pipeline businesses have generally decreased or remained flat since 2014 on all networks, with the exception of Powerco, due to planned outages for replacement works of pre-1985 pipes in the Hutt Valley and Porirua region.

44. The remainder of the chapter is structured as below, following an overview of local gas pipeline businesses:

    44.1 regulated revenue

    44.2 primary components recovered by revenue

    44.3 capital expenditure

    44.4 investment breakdown

    44.5 operating expenditure

    44.6 service reliability

    44.7 profit

    44.8 return on investment.

Overview of local gas pipeline businesses

45. Local gas pipeline businesses are responsible for the transport of natural gas from gas gates on the high-pressure gas transmission system through to households and businesses across the North Island.

46. Local gas pipeline businesses deliver gas to a range of consumers, from households to some large industrial customers.[25] Households and businesses (eg, greenhouses, hospitals, restaurants) use gas primarily for cooking and water and space heating, while some larger industrial processes may use gas as a feedstock. Table 1 shows the number of customers

[25] Large industrial customers with higher volume or pressure needs will generally connect directly to gas transmission pipelines.

connected to local gas pipeline businesses, represented by installation control points (**ICP**s), and the average gas volume consumed in gigajoules (**GJ**) by each customer type in the 2021 disclosure period.

Table 1: number of customers and average gas volume consumed by customer type in 2021 (most recent disclosure period)

Customer type	Number of ICPs	Average volume consumed (GJ/ICP/year)
Residential and small business	294,393	26
Business and small commercial	6,911	340
Medium and large commercial	1,899	1,967
Industrial and Non-standard	529	37,505

47. Residential and small business consumers far outnumber other gas consumers, but on average each residential and small business customer consumes a relatively small amount of gas. In contrast, very few industrial consumers are connected to local gas pipelines but consume over 1,400 times more than residential and small business customers on average.

48. The local gas pipeline businesses we regulate are Vector, Powerco, First Gas and GasNet. Each local gas pipeline business operates in different regions, as described in paragraph 5. Within this chapter, "First Gas" refers to the First Gas distribution business (ie, not the gas transmission business).

    48.1 First Gas began operating as a local gas pipeline business in 2016, as described in paragraph 6. Trends shown at the local gas pipeline business level therefore do not include any data for First Gas prior to 2016. Additionally, Vector's revenues and expenditure in absolute terms are much smaller after 2016 as a result of the sale of its network outside of Auckland.

49. The regions that the local gas pipeline businesses operate in do not overlap with each other, which results in localised monopolies in the services that they provide using their local gas pipeline assets. Table 2 shows the length of each gas pipeline system and the average number of connections per kilometre, as at the end of the 2021 disclosure period.

Table 2: Table of gas pipeline characteristics in 2021 (most recent disclosure period)

Gas pipeline business	System length at year end (km)	Gas consumer density (ICP/km) (Average number of ICPs in disclosure year per system length)
First Gas Distribution	4,917	14
GasNet	688	15
Powerco	6,150	18
Vector	6,825	17
First Gas Transmission	2,514	NA

50. Vector and Powerco have the largest and most customer-dense networks. Given their sizes, Vector's and Powerco's investment and expenditure will *generally* (but not always) drive the trends observed across the local gas pipeline businesses collectively. First Gas also has a local gas pipeline system of considerable length, but its network covers some regions with lower population densities, resulting in fewer customers per kilometre.

51. Local gas pipeline network assets fall broadly into three categories:

51.1 mains pipes, which are underground and operate at different pressures to move gas to service points on the street;

51.2 service pipes, which branch off main pipes and deliver gas to individual customers; and

51.3 additional equipment for:

51.3.1 pressure regulation (ie, District Regulation Stations, **DRS**);

51.3.2 isolation (ie, line and service valves);

51.3.3 special crossings (above or below ground sections of pipe to traverse natural or constructed environmental features);

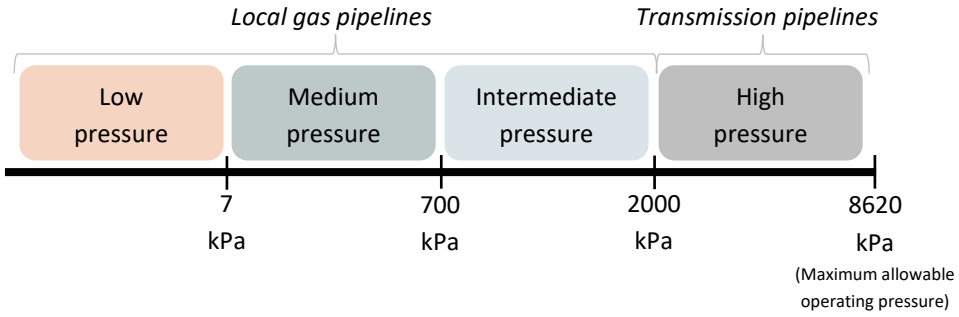
51.3.4 corrosion protection (ie, cathodic protection systems);

51.3.5 safety and protection; and

51.3.6 communication of data (ie, supervisory control and data acquisition (**SCADA**) systems).

52. Local gas pipelines and transmission pipelines transport gas at different pressures. Figure 4 shows the range of pressures applicable to different classes of pipes.

Figure 4: Pipe pressure classifications for local gas pipelines and transmission pipelines



Local gas pipeline businesses are subject to a weighted average price cap under their default price-quality path

53. At least every five years we undertake a review of the DPP that applies to local gas pipeline businesses.[26, 27] The first DPP applied from October 2013 to September 2017. The previous reset was in May 2017 and applied from 1 October 2017. The most recent reset was in May 2022 and applies from 1 October 2022 onwards.

54. The starting price for local gas pipeline businesses is specified in terms of an initial maximum allowable revenue (**MAR**) value. This is net of pass-through costs and recoverable costs. The MAR reflects several elements, including:

    54.1 what an appropriate return on the regulated assets of the gas pipeline businesses would be, represented by our estimate of the weighted average cost of capital (**WACC**);

    54.2 our forecast of how the RAB will change (through the commissioning of new assets and depreciation); and

    54.3 how we forecast the operational expenditure of the local gas pipeline business during the regulatory period.

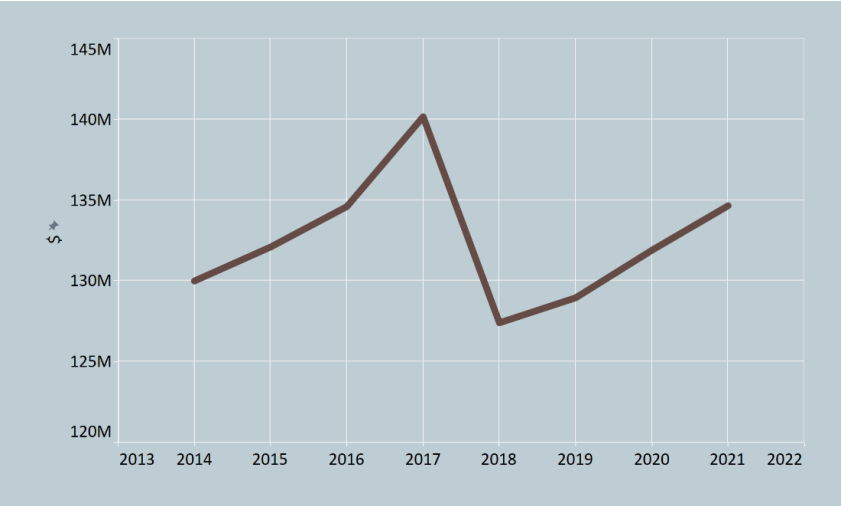
55. The average price charged across the customer base is then capped, rather than the *total* amount of the revenue; this is known as a weighted average price cap (**WAPC**). We do not cap individual prices for specific customer groups, but set a maximum average price. The allowable revenue over time determined using the MAR can change depending on the actual demand of customers, compared to the demand that is forecast when the DPP is set. A WAPC indirectly incentivises local gas pipeline businesses to grow their customer base as they are rewarded with an increase in total revenue.

Local gas pipeline businesses are collectively earning $5m more revenue than they did in 2014

56. Local gas pipeline businesses recover the cost of providing regulated gas distribution network services by collecting revenue from the gas customers that they serve (passed through via a retail bill). The prices they are allowed to charge are determined by PQ regulation, which we reset at least every five years. Figure 5 shows the total revenue collected by all local gas pipeline businesses from 2014 to 2021 in nominal terms.

[26] Commerce Act 1986, s 53M(4).
[27] Section 53M(5) of the Commerce Act allows us to set a shorter regulatory period than five years if we consider that it would better meet the purpose of Part 4 of the Act (but not shorter than four years).

Figure 5: Total revenue for all local gas pipeline businesses, 2014-2021



57. The total revenue from local gas pipeline services has increased by $4.7m (or by 3.6%) from $130m since 2014. Following a peak of $140m in 2017, total revenue dropped to $127m in 2018 but has been steadily increasing since.

The number of customers connected to local gas pipeline businesses has increased by 1.6% per year since 2014, with growth largely from residential and small business connections

58. The number of customers connected to a local gas pipeline (represented by ICPs) and the volume of gas delivered are key drivers of network growth for local gas pipeline businesses (and therefore investment and cost recovery). Figures 6 and 7 show the total number of ICPs connected to local gas pipelines, and the volumes of gas delivered through these pipelines between 2014 and 2021. Figure 8 shows the growth in customer connections and gas delivered broken down by customer type, for all local gas pipeline businesses between 2014 and 2021.

Figure 6: Total number of ICPs connected to local gas pipelines, 2014-2021

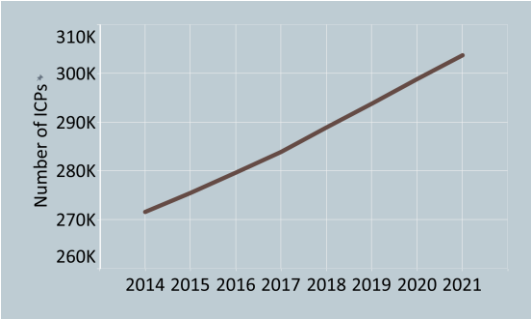
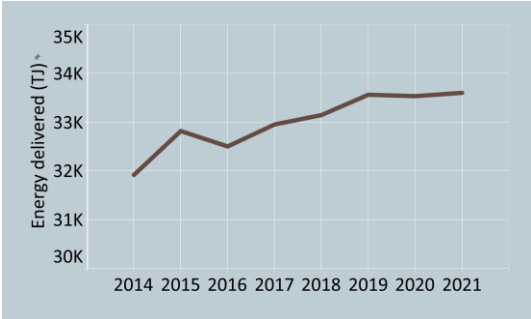


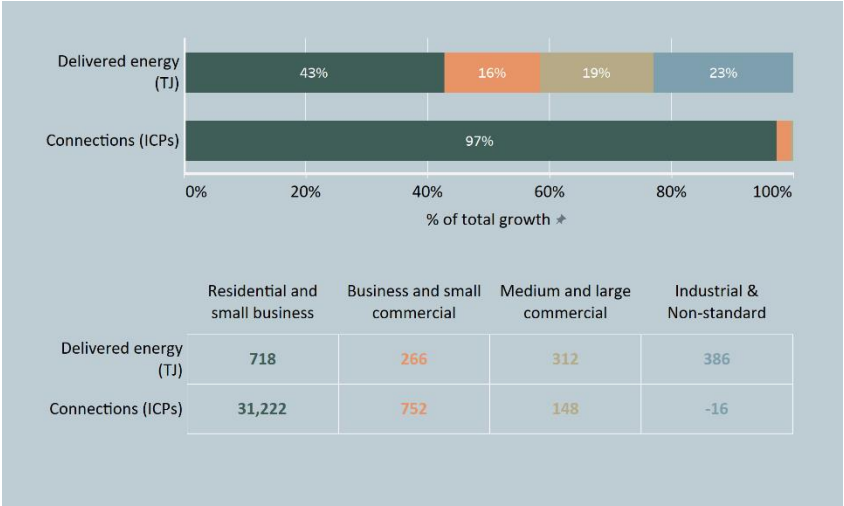
Figure 7: Total energy delivered through local gas pipelines, 2014-2021



59. The total number of ICPs connected to local gas pipelines has increased by just over 32,000 connections since 2014. Growth has been steady over time, at a rate of 1.6% per year on average between 2014 and 2021. Most of this increase has been from residential and small business connections.

60. The volume of energy delivered through local gas pipelines has also increased, by 1,682 terajoules (**TJ**[28]) since 2014, or 0.7% per year on average.

Figure 8: Share of growth in ICPs and delivered volume by customer type for all local gas pipeline businesses, 2014-2021



	Residential and small business	Business and small commercial	Medium and large commercial	Industrial & Non-standard
Delivered energy (TJ)	718	266	312	386
Connections (ICPs)	31,222	752	148	-16

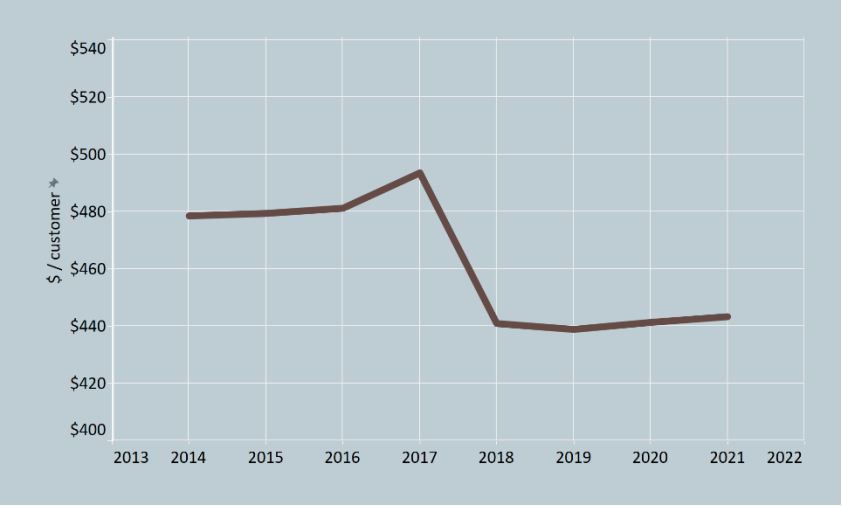
61. Although residential and small business connections each consume comparatively little gas on average (~0.04TJ per year), the total volume growth has been greatest for residential and small business connections (718 TJ since 2014), followed by business and commercial connections (578 TJ since 2014) and industrial and non-standard connections (386 TJ since 2014), as a result of the significant growth in residential and small business connections since 2014.

[28] One TJ is equivalent to 1000 GJ.

Customers of local gas pipeline businesses are paying $36 less on average than they did in 2014

62. We use the number of customers to represent growth in demand on local gas pipelines in this report. Trends adjusted for the volume of energy delivered are largely the same as those adjusted for the number of customers.[29] Figure 9 shows the average revenue per customer across all local gas pipeline businesses from 2014 to 2021.

Figure 9: Average revenue per ICP across all local gas pipeline businesses, 2014-2021



63. Revenues have fallen by $36 per customer in nominal terms between 2014 and 2021, or by 8%; this decrease contrasts with the increase in total revenues alone due to growth in the number of customers connected to local gas pipelines. This decrease can also be explained in part by the changing gas customer mix, ie, an increased proportion of total number of customers that are residential and small business consumers. Each individual residential and small business customer consumes far less gas than large business, commercial or industrial customers, and the revenue of local gas pipeline businesses from each residential and small business customer is thus also (relatively) small. As customer growth has been largely from residential and small business customers as noted in paragraph 60, even as the total revenue grows, the average annual revenue across all gas customers has been falling.

After accounting for general price inflation, local gas pipeline business revenues have fallen by $99 per customer since 2014

64. The total revenue increase described above reflects the general price pressures, or inflation, that impact the wider economy. Figures 10 and 11 show the change in the consumer price index (**CPI**) used to represent inflation since 2014, and the annual change in revenue per customer adjusted for inflation (or, in 'real' terms) since 2015.

[29] We have chosen to use ICPs in preference to TJ, though variation in the energy used by each customer will mean that this does not allow a full appreciation of the rate of change in the 'use' of pipelines in all cases.

Figure 10: Annual rate of inflation, years ending September, 2014-2021

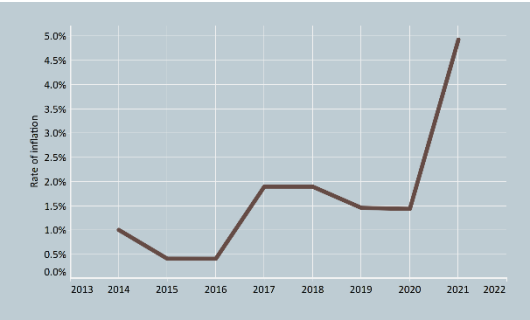
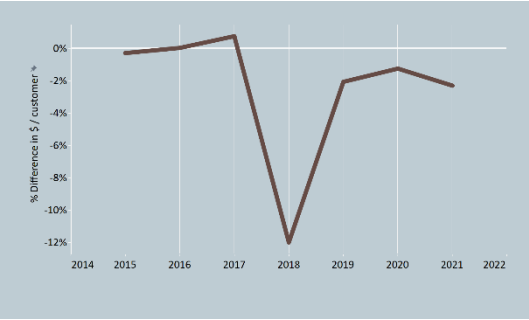


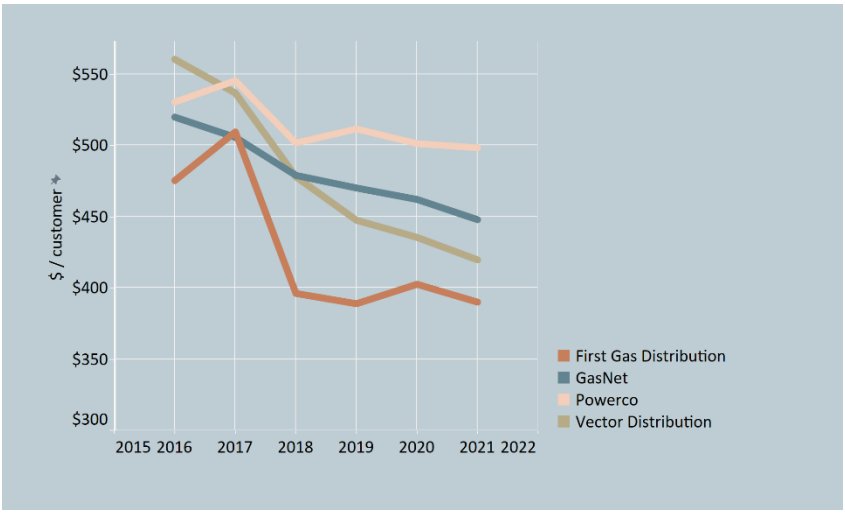
Figure 11: Annual rate of change in total revenue per ICP connected to all local gas pipeline businesses, adjusted for inflation (ie, in real terms), 2015-2021



65. CPI has increased by approximately 1.8% per year on average (and 13% in total) since 2014, with the sharpest increase in the 2021 year. Using CPI to adjust for inflation, revenues have fallen by $99 per customer in real terms, or 21% between 2014 and 2021. The rate of change in real revenue per customer connection has fluctuated over this time, and a step down in 2018 is consistent with the reset of local gas pipeline business' price-quality paths in 2017 – as typically any significant realignment occurs in the first year of the five-year regulatory period.

66. Similar downward trends in real revenue per connection can be observed for each of the local gas pipeline businesses. These are shown in Figure 12, which shows the total revenue per ICP for each local gas pipeline business, adjusted for inflation, between 2016 and 2021. Note that the data is limited to this range as 2016 was the first disclosure period for the 'First Gas Distribution' entity, following First Gas' purchase of Vector's local and transmission gas pipelines outside of Auckland (described in paragraph 6).

Figure 12: Total revenue per ICP for each local gas pipeline business, adjusted for inflation (ie, in real terms), 2016-2021



67. Over the last six years, all local gas pipeline businesses have seen their revenue per ICP decrease in real terms, by between 1% (Powerco) and 6% (Vector) on average per year. The realignment in the first year of the new regulatory period is most noticeable for Vector, Powerco and First Gas, of which the latter two went on to have slight increases in real revenue per customer connection between 2018 and 2021.

Local gas pipeline business revenue recovers five primary components, with operating expenditure and depreciation comprising 33% and 27% respectively in 2021

68. The revenue of local gas pipeline businesses allows them to recover five high-level components:

    68.1 Opex, which is comprised of costs that are borne by the pipeline business and relate to the services that the business provides using its assets;

    68.2 Depreciation, which represents the recovery of capital invested in the local pipeline business over the asset's life;

    68.3 A component that they retain as cash profit. Cash profit is defined within this report as the total regulatory profit after tax excluding revaluations;

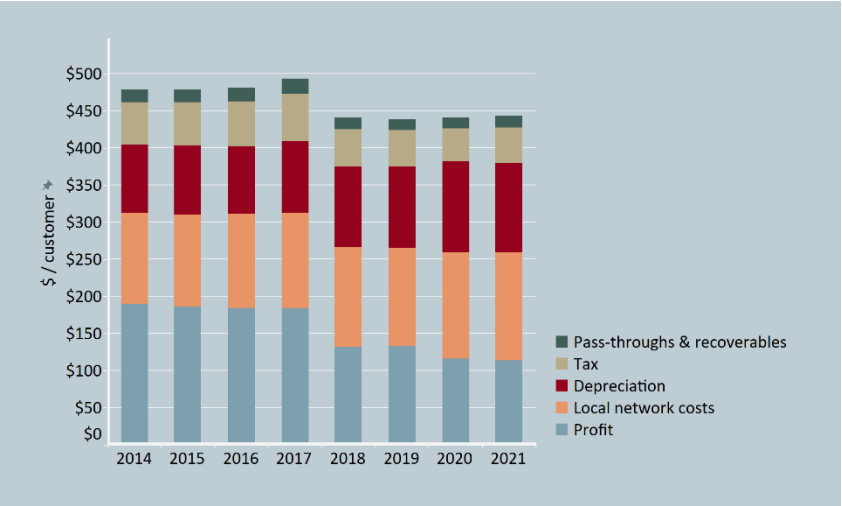
    68.4 Tax, which is primarily driven by profit; and

    68.5 Pass-through or recoverable costs, which are the costs of services provided by other parties, eg, rates, levies under the Act and industry levies.[30] The local gas pipeline businesses 'pass-through' or recover these costs by bundling them into network charges and passing on the funds they receive from customers (via retailers) to the parties that provide the service, without any mark-up. Transmission charges are billed separately rather than being passed through; further detail is provided in paragraph 79.

69. Figure 13 shows the breakdown of revenue per customer in nominal terms between 2014 and 2021.

[30] Recoverable costs may also include costs such as certain fees payable in relation to a customised price-quality path (**CPP**), urgent project allowances allowed under a CPP, or catastrophic event allowances.

Figure 13: Breakdown of local gas pipeline business revenue per customer, 2014-2021



70. At a per-customer level, opex costs are the largest component of revenue at 33% in 2021, followed by depreciation and cash profits at 27% and 26% respectively in 2021. Tax and pass-through and recoverable costs are comparatively small.

Depreciation and operating costs have increased by 5% and 4% per year on average respectively since 2014, while profit has declined following the 2017 DPP reset

71. Figures 14 to 21 show the trends in the total opex, depreciation, cash profit, and pass-through and recoverable cost components for all local gas pipeline businesses between 2014 and 2021, and for each local gas pipeline business individually between 2016 and 2021.

Figure 14: Opex trend across all local gas pipeline businesses, 2014-2021

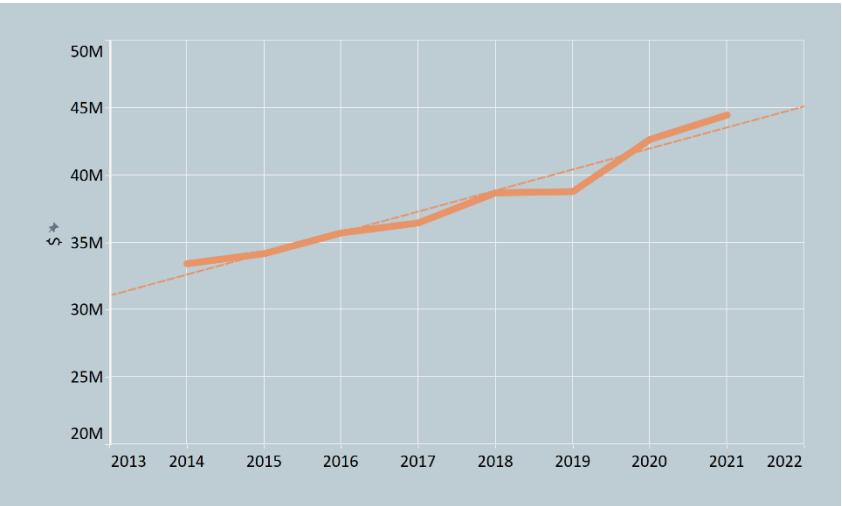
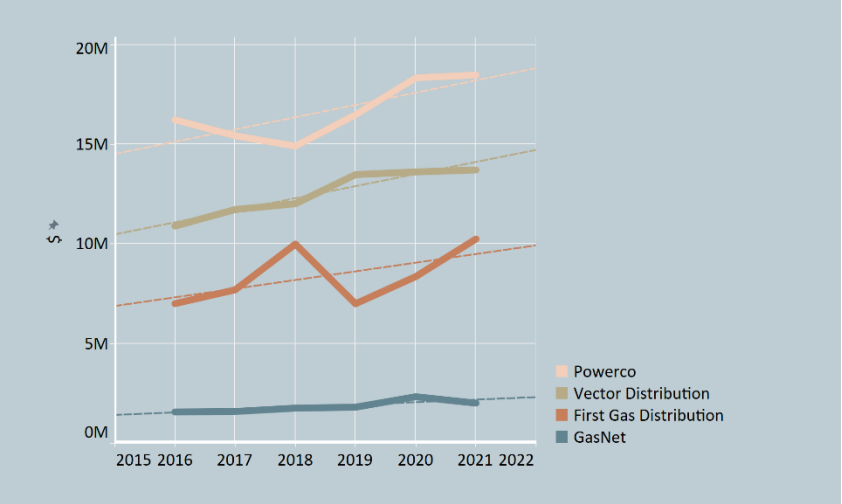


Figure 15: Opex trend for each local gas pipeline business, 2016-2021



72. Opex has historically been the largest component of revenue and has increased consistently since 2014, by $1.6m or 4% per year on average. The trend is similar at a per customer level, but growth in the number of connections has tempered the increase in opex per connection, increasing from $123 per customer on average by $23 (19%) since 2014, or 2.5% per year on average.

73. All local gas pipeline businesses have seen increases of between 14% (Powerco) to 47% (First Gas) in their annual opex over this period. Increases in opex have been greatest for First Gas and Vector, with increases of $3.3m (47%) and $2.8m (26%) in nominal terms respectively since 2016.

Figure 16: Depreciation trend across all local gas pipeline businesses, 2014-2021

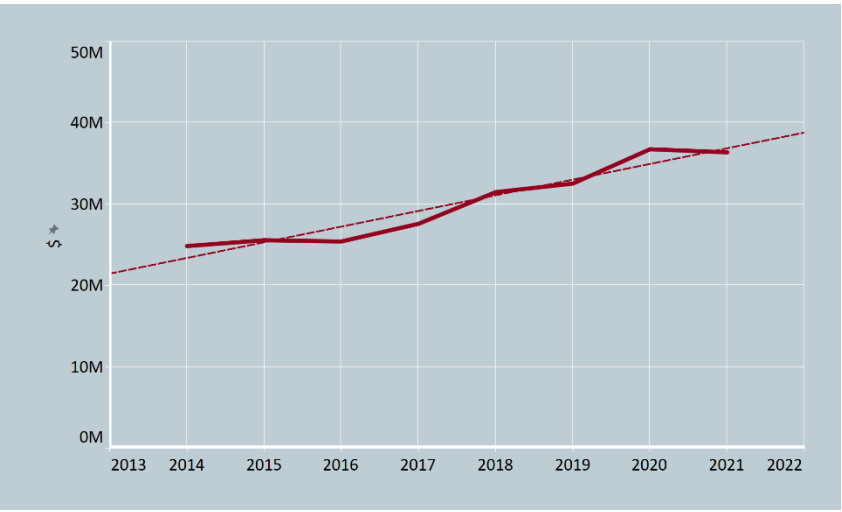
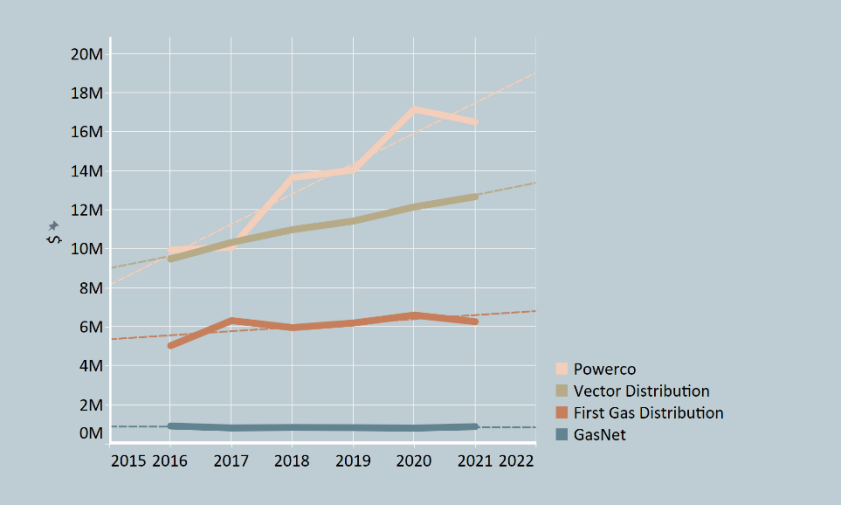


Figure 17: Depreciation trend for each local gas pipeline business, 2016-2021



74. While smaller than opex, depreciation has been increasing at a faster rate since 2014, at $1.7m or 6% per year on average. At a customer level, depreciation has increased since 2014 from $91 per customer on average by $29 (32%), or 4% per year.

75. The increase in depreciation seen at an industry level between 2017 and 2021 is attributable to a marked increase in Powerco's depreciation over the same period. This is described in greater detail later at paragraph 94. Between 2016 and 2021, Powerco had the greatest increase in depreciation at $0.9m or 11% per year on average, followed by Vector and First Gas with increases of $0.5m (6%) and $0.2m (5%) per year on average. GasNet's depreciation has remained flat over the 2016 to 2021 period.

Figure 18: Cash profit trend across all local gas pipeline businesses, 2014-2021

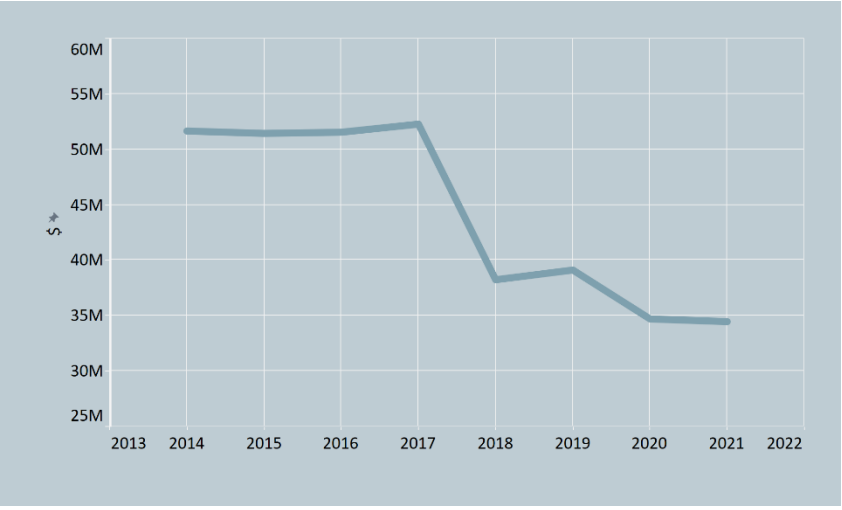
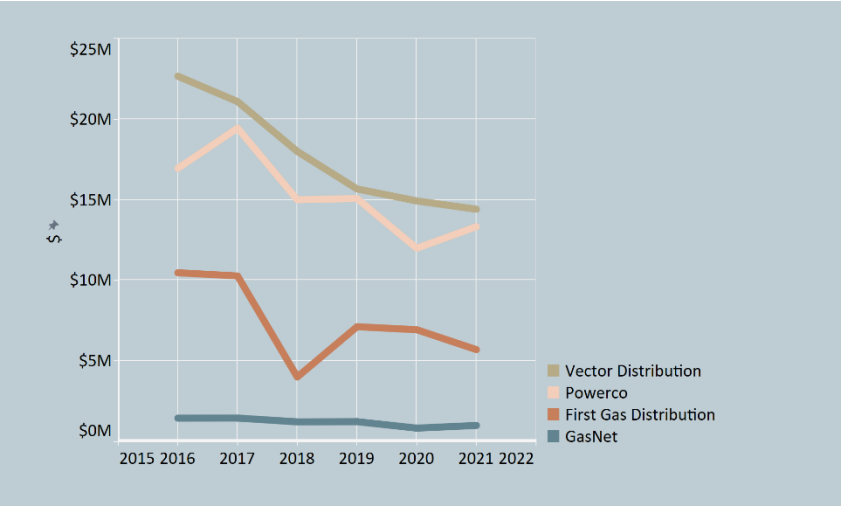


Figure 19: Cash profit trend for each local gas pipeline business, 2016-2021



76. The WACC we estimate when we set the price-quality path for local gas pipeline businesses determines our expectations of profit for each local gas pipeline business at the time we set the DPP (through the allowed rate of return on their regulated assets, described in paragraph 55).[31] Cash profits have decreased by $2.4m or 6% per year on average between 2014 and 2021, and have fallen for each of the local gas pipeline businesses by at least 21% since 2016. Profits as a proportion of each local gas pipeline businesses' revenues have decreased between 27% (Powerco) and 49% (First Gas). Profit and return on investment for local gas pipeline businesses is described in further detail at the end of this chapter.

77. Tax has decreased by $1.3m since 2014, following the downward trend in cash profits.

[31] As our estimate of WACC includes a forecast of inflation, the actual allowed rate of return may differ once the difference in forecast and ex-post inflation is accounted for. Ex-post return on investment is discussed in further detail at the end of this chapter.

Figure 20: Pass-through and recoverable costs trend across all local gas pipeline businesses, 2014-2021

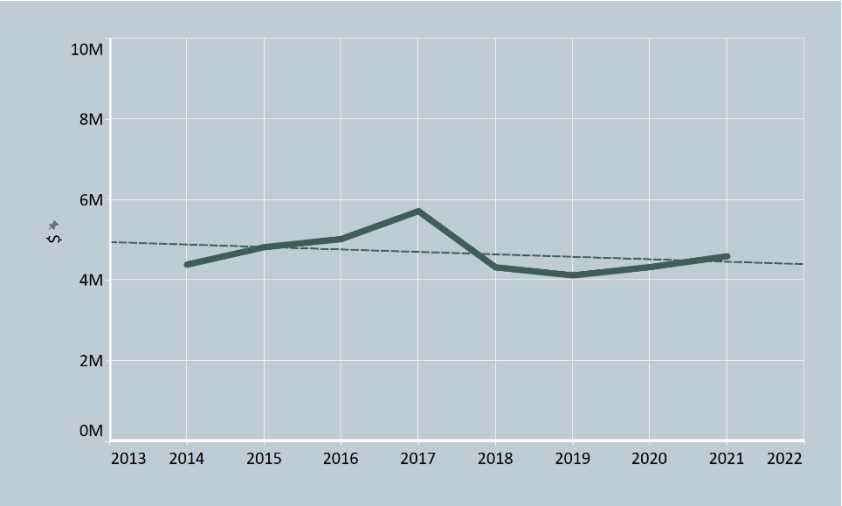
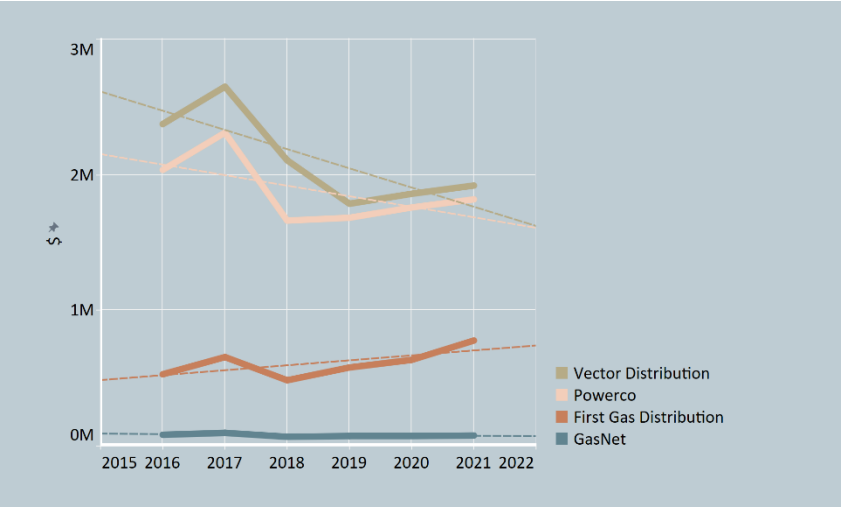


Figure 21: Pass-through and recoverable costs trend for each local gas pipeline business, 2016-2021



78. The pass-through component of local gas pipeline business revenue does not include the costs associated with gas transmission pipelines and thus forms a comparatively small component of local gas pipeline business revenue.[32] Gas transmission costs are not passed through to customers via local gas pipeline businesses, but by the gas retailer. Pass-through and recoverable charges increased from $4.4m to $5.7m between 2014 and 2017, before falling back to $4.3m in 2018 and remaining fairly steady with a small increase to $4.6m in 2021. Pass-through and recoverable costs were approximately $15 per customer on average in nominal terms in 2021.

[32] We also regulate local electricity lines businesses under Part 4 of the Act, and their pass-through and recoverable costs are a proportionally larger revenue component as they do include electricity transmission charges.

79. Pass-through and recoverable costs have decreased for Powerco and Vector by 10% and 21% respectively since 2016. GasNet's pass through and recoverable costs have remained flat. First Gas' pass-through and recoverable costs have risen by 60% over the same period, owing to an increase in their rates – up from $285,000 in 2016 to $563,000 in 2021.

Local gas pipeline businesses' capex was 45% higher in 2021 than in 2014, mostly in network assets directly

80. Both capex and opex across local gas pipeline businesses has been increasing over time, as shown in Figure 22.

Figure 22: Total capex vs opex for all local gas pipeline businesses, 2014-2021

81. As a proportion of total expenditure, local gas pipeline businesses collectively spend more on capex projects than opex. Total industry capex has also increased at a faster rate than opex since 2014 – capex has increased by $19m (45%), while opex has increased by $10m (30%) in nominal terms.

82. Local gas pipeline businesses invest in assets to support the growth and health of the networks that they operate. Capex is reported by local gas pipeline businesses across a range of ID categories, which fall under four broad descriptions. These categories and the purpose of the capex are described in Table 3.

83. Local gas pipeline businesses capex can be split into costs associated with network and non-network assets:

83.1 *Network assets* are directly involved in distributing gas from the high-pressure transmission network to a customer's household, eg, pipelines, line valves, protection and control systems.

83.2 *Non-network assets* support local gas pipeline services but are not part of the network itself, eg, vehicles, office equipment.

84. The capex categories in Table 3 that relate to network assets are described as *network* capex, and those relating to non-network assets as *non-network* capex.

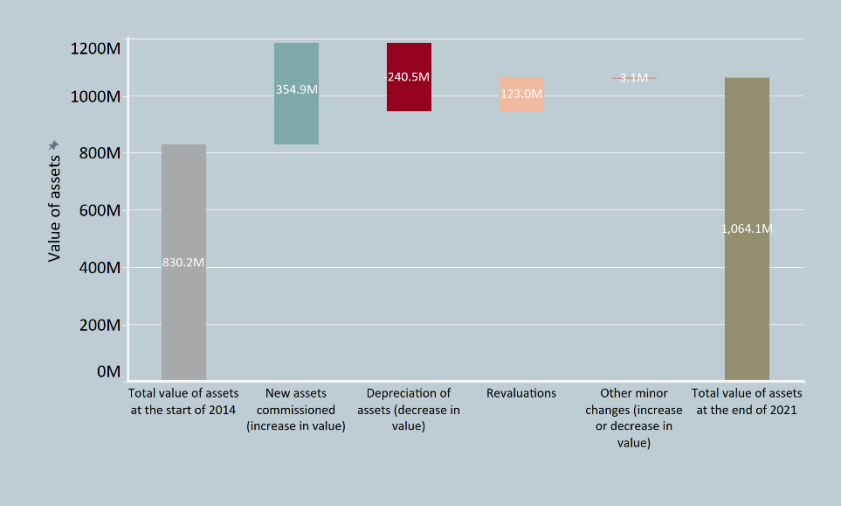
Table 3: Mapping of categories and purpose of capex

Category used	Capital expenditure category in ID	Capex type	Purpose of capex
Maintaining assets	Asset replacement and renewal	Network	To mitigate deterioration of assets or their surroundings, or address obsolescence of assets
	Reliability, safety and environment	Network	To improve the quality or safety of the network for consumers, to meet regulatory requirements or achieve enhancements related to the environment
Supporting growth	Consumer connections	Network	To establish new connection points for consumers on the network, or alter existing connection points
	System growth	Network	To implement a change in demand on the network assets (and includes expenditure that is not recoverable from the source of the change in demand)
Office and support	Non-network routine	Non-network	On general assets not directly related to the network used in the supply of gas distribution services
	Non-network atypical	Non-network	Special projects not directly related to the network used in the supply of gas distribution services
Other ancillary investment	Network relocation	Network	Expenditure to relocate assets, with service potential not being materially different from the original location
	Financing	Non-network	Costs associated with borrowing for capex projects/programmes

The regulated asset base of all local gas pipeline businesses was valued at over $1b in 2021, an increase of $234m since 2014

85. Capex contributes to the growth of the local gas pipeline businesses' RAB (the assets used by the local gas pipeline businesses to deliver the regulated services, and is the basis upon which local gas pipeline businesses' profit is estimated when the DPP is set) once assets are commissioned. Figure 23 shows the drivers of changes to the industry's total RAB value between 2014 and 2021.

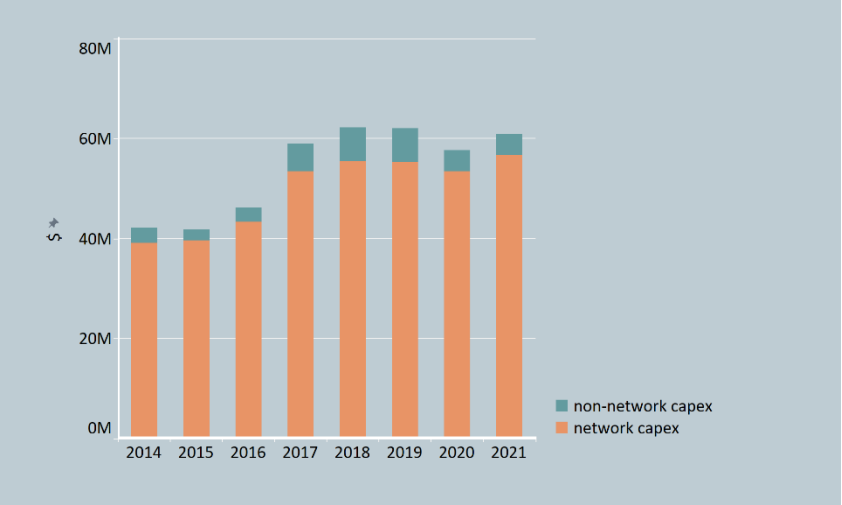
Figure 23: Waterfall of changes for RAB across all local gas pipeline businesses, 2014-2021



86. Newly commissioned assets are the most significant contributor to the change in value of the RAB, with an addition of $355m since 2014. Depreciation has decreased the RAB by $240m over the same period, while revaluation has lifted the RAB value by $123m. In total, local gas pipeline businesses have a RAB valued at over $1b in 2021.

87. The RAB is composed primarily of network assets, reflecting that historical capex has been dedicated largely to network investment. Figure 24 shows the split of capex between network and non-network investment across all local gas pipeline businesses, from 2014 to 2021.

Figure 24: Split of network vs non-network capex for all local gas pipeline businesses, 2014-2021



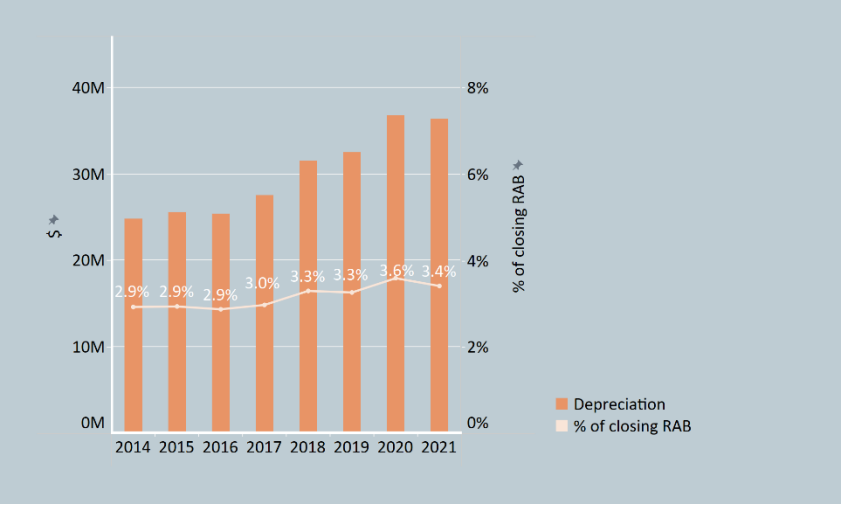
88. Network capex has increased by $18m or 45% between 2014 and 2021 but has been fairly consistent since 2017. Investment in non-network assets has increased by $1m or 43% since

2014 and, unlike network capex, has increased most between 2017 and 2019, with spend levelling off to just over $4m in 2020 and 2021.

An increase in network and non-network capital expenditure has led to steady increases in depreciation since 2014

89. An increase in commissioned capex ultimately flows through to the prices consumers pay for the services of the local gas pipeline businesses via increases in the value of the RAB and thus depreciation which, along with forecast opex allowances, factors into the setting of the MAR. Increasing levels of capex across network and non-network assets have led to a steady increase in depreciation over time, shown in Figure 25 in total and as a proportion of the RAB.

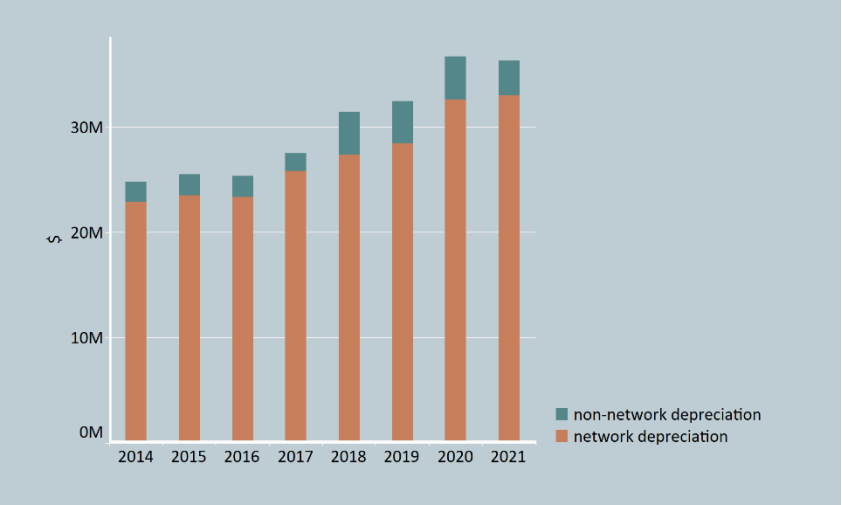
Figure 25: Total depreciation and as a percentage of RAB for all local gas pipeline businesses, 2014-2021



90. Total depreciation across all local gas pipeline businesses has increased from $25m or 2.9% of the industry RAB in 2014, up to $36m or 3.4% of the industry RAB in 2021. Depreciation as a proportion of a given asset's remaining value increases over time as the remaining life of that asset falls, so the increase of depreciation as a percentage of the closing industry RAB also indicates a slowly aging asset base on average.

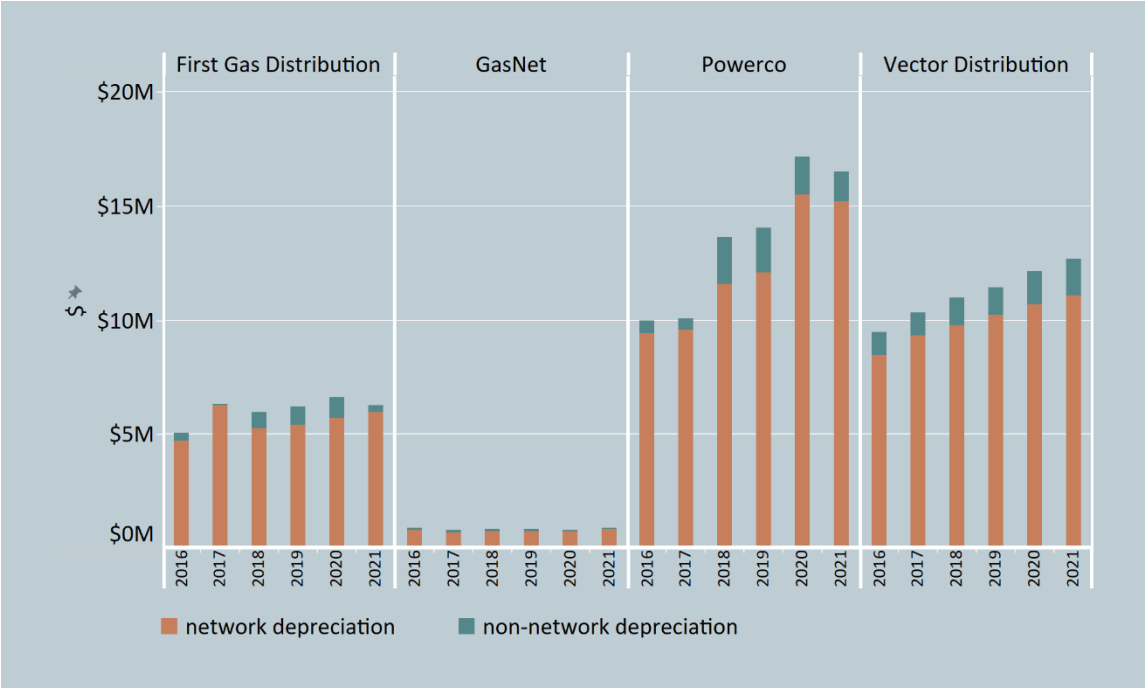
91. Consistent with network investment being a greater proportion of overall capex, network depreciation far outweighs the amount of non-network depreciation. Figure 26 shows the proportion of network to non-network depreciation for all local gas pipeline businesses between 2014 and 2021, while Figure 27 shows the proportion of network to non-network depreciation for each local gas pipeline business between 2016 and 2021.

Figure 26: Split of network vs non-network depreciation for all local gas pipeline businesses, 2014-2021



92. Network depreciation across all local gas pipeline businesses has increased by $10m or 45% since 2014. Increases in non-network capex have led to an increase in non-network depreciation of $1.3m or 65% since 2014, as investments in non-network assets are depreciated quicker than network assets due to their shorter useful asset lives. However, non-network depreciation remains a comparatively small portion of total depreciation.

Figure 27: Split of network vs non-network depreciation for each local gas pipeline business, 2016-2021



93. First Gas' and Vector's network depreciation have risen by $1.3m (28%) and $2.6m (31%) respectively since 2016, and GasNet's network depreciation has remained flat over the same period. Powerco has seen a large increase in its network depreciation of $5.8m or 62% since 2016, with step changes in 2018 and 2020. Rather than a significantly increased capex programme, these changes are attributable to:

    93.1 an update to the asset lives for Powerco's largest asset categories in 2018, to reflect the standard physical asset lives more accurately. This resulted in shorter asset lives across a significant portion of their RAB, which means that the depreciation that recovered the total investment in these assets needed to be larger per year for the remainder of their lives; and

    93.2 the application of more granular asset life measurements applied to the calculation of network asset depreciation in 2020, made possible due to recent IT system investment. The application of shorter asset lives across some assets similarly resulted in higher depreciation per year for the remainder of these assets' lives.

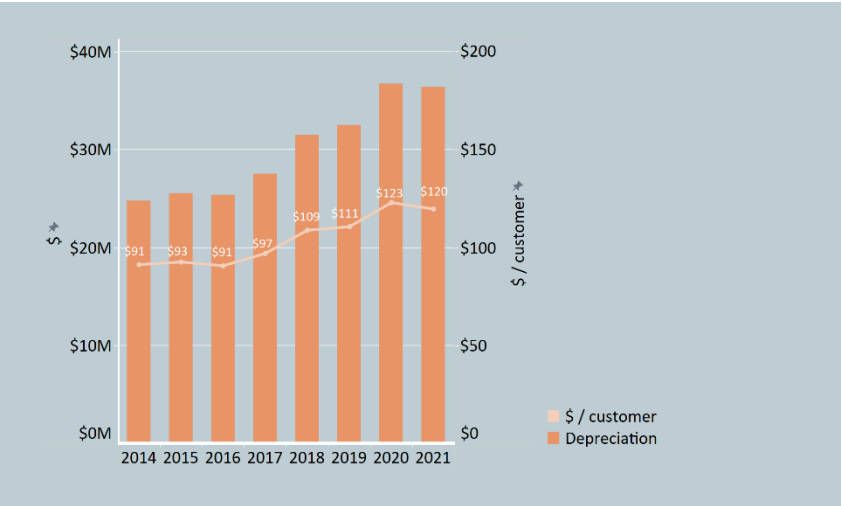
94. The overall effect of these changes is to bring Powerco's depreciation forward in time.

95. The increase in non-network depreciation seen at an industry level has also been driven by Powerco, which has seen its non-network depreciation increase by $0.8m since 2016. Changes in non-network depreciation have been less marked for First Gas and Vector, at $0m and $0.6m respectively, while GasNet's non-network depreciation has decreased by $0.1m between 2016 and 2021.

Customers are each paying $29 more on average for depreciation in 2021, compared to 2014

96. All depreciation is ultimately reflected in the line charges paid by customers and has been growing on a per-connection basis up until 2021, where there was a small decrease ($3 per customer) from 2020. Figure 28 shows the trend in depreciation per ICP across all local gas pipeline businesses between 2014 and 2021.

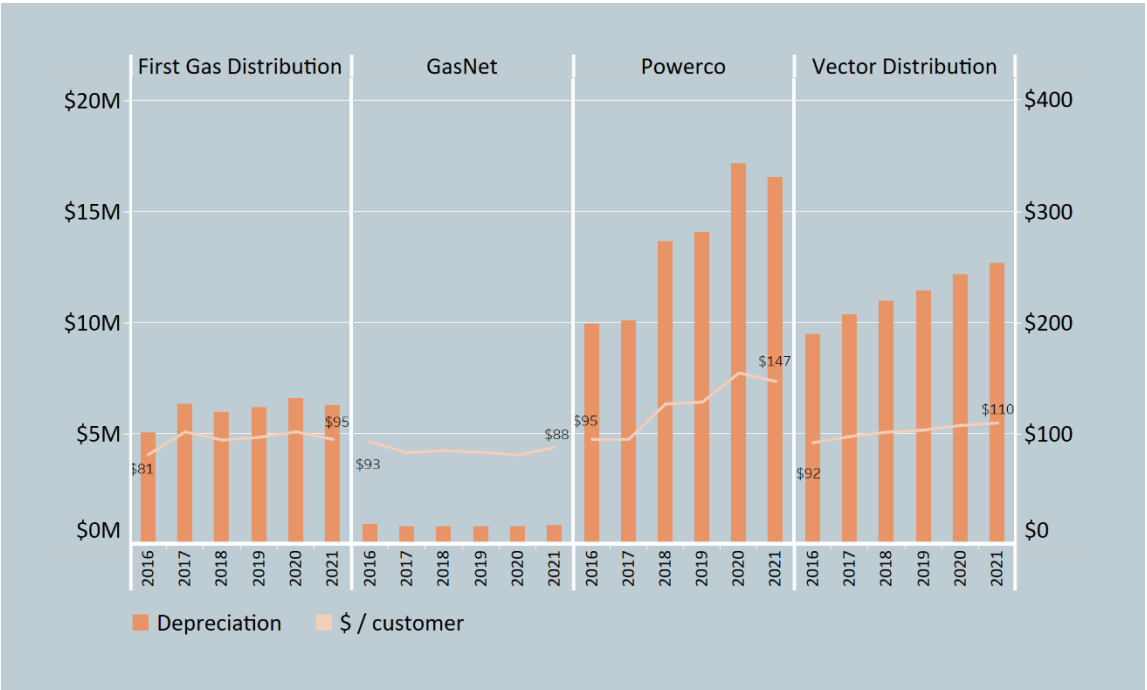
Figure 28: Depreciation per customer for all local gas pipeline businesses, 2014-2021



97. Increases in depreciation have outpaced customer growth, rising by $29 per customer in nominal terms since 2014. More than half of the increase in depreciation per ICP occurred between 2019 and 2020.

98. Trends in depreciation differ noticeably between local gas pipeline businesses. Figure 29 shows depreciation per customer for each individual local gas pipeline business between 2016 and 2021.

Figure 29: Depreciation per customer for each local gas pipeline business, 2016-2021

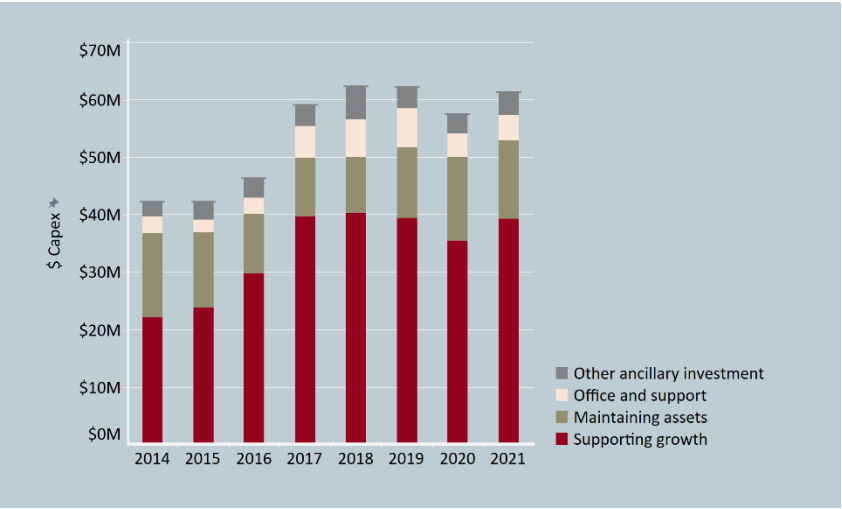


99. Depreciation per customer has risen for the three largest local gas pipeline businesses but has fallen for GasNet since 2016. Powerco has seen the largest increase over the last five years, with step changes in 2018 and 2020, and a decrease in 2021, for the reasons described in paragraph 93.

Local gas pipeline investment has been focused on supporting growth on networks and maintaining assets

100. Local gas pipeline business capex programmes have been focussed mainly on the 'supporting growth' and 'maintaining assets' capex categories. Figure 30 shows capex by high-level investment category across all local gas pipeline businesses between 2014 and 2021.

Figure 30: Capex by high-level investment category for all local gas pipeline businesses, 2014-2021



101. Expenditure to support network growth includes 'consumer connection' expenditure (the direct costs of connecting new customers to the network) and 'system growth' expenditure (costs associated with growing use of the network, typically relating to step-changes in capacity). Capex to support growth has totalled $270m over the last eight years and increased by $17m since 2014.

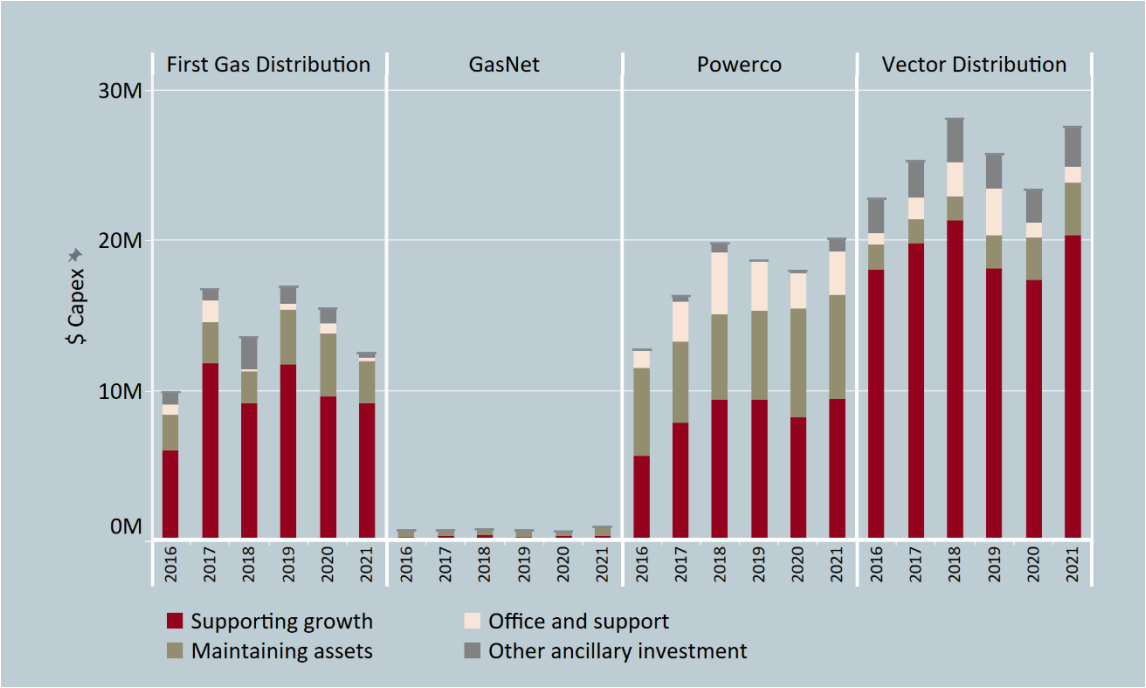
102. As per paragraph 56, we limit the revenue of local gas pipeline businesses, but the WAPC allows them to earn more (or less) revenue depending on the extent to which actual demand is more (or less) than what is forecast when the DPP is set. This has historically provided an indirect incentive for local gas pipeline businesses to grow the number of customer connections on their networks, allowing local gas pipeline businesses to thereby increase

their total revenues and profits.[33] This is consistent with the growth in 'consumer connection' and 'system growth' capex shown in Figure 32.

103. Expenditure to maintain assets is focussed on replacing or improving existing assets to ensure they remain safe and fit-for-purpose. Maintaining assets capex includes expenditure for 'asset replacement and renewal', and 'reliability, safety and environment', which have totalled $99m over the last eight years and decreased by $1m since 2014.

104. Figure 31 shows the capex by investment type for each individual local gas pipeline business since 2016.

Figure 31: Capex by high-level investment category for each local gas pipeline business, 2016-2021



105. Vector and Powerco have been responsible for most local gas pipeline investment since 2016. Powerco's capex has also increased at the fastest rate since 2016, from $12.8m by $7.3m or 57%.

106. Vector spends most on supporting growth in its network, averaging $19m per year since 2016. Vector also spent the most of all local gas pipeline businesses in other ancillary investment since 2016, due to its high level of spending on network relocations which averaged $2.5m per year since 2016. Powerco invests more than any other in maintaining assets and office and support, investing an average of $6m and $3m per year respectively between 2016 and 2021. First Gas invests primarily in supporting growth, averaging $10m

[33] The MAR may grow with inflation and forecast growth in quantities; the latter includes the relative growth in demand for each demand group (broadly, consumer types).

per year since 2016, while GasNet's investment is focussed on maintaining assets at $0.4m per year on average over the same period.

Investment in new connections and system growth has dominated capital expenditure on local gas pipeline businesses since 2014

107. Demand growth and new customer connections can cause a need to reinforce parts of the network, which may require occasional periods of greater investment in assets that are used by large numbers of customers, classed as system growth capex. As a result, both new connection capex and system growth capex are in the 'supporting growth' category. Figure 32 shows investment in new connections and system growth capex across all local gas pipeline businesses between 2014 and 2021, while Figure 33 shows a breakdown of the investment in system growth across local gas pipeline businesses from 2014 to 2021.

Figure 32: Supporting growth capex for all local gas pipeline businesses, 2014-2021

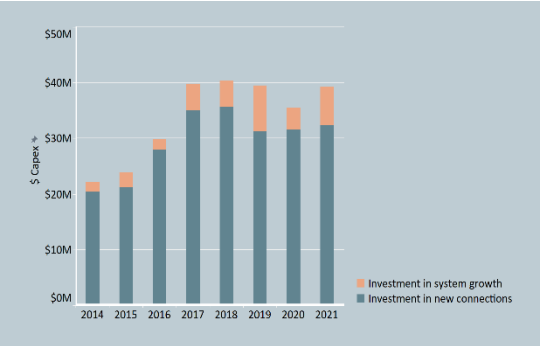
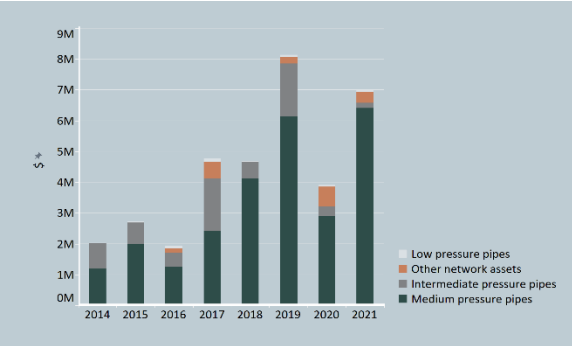


Figure 33: Breakdown of investment in system growth by all local gas pipeline businesses, 2014-2021

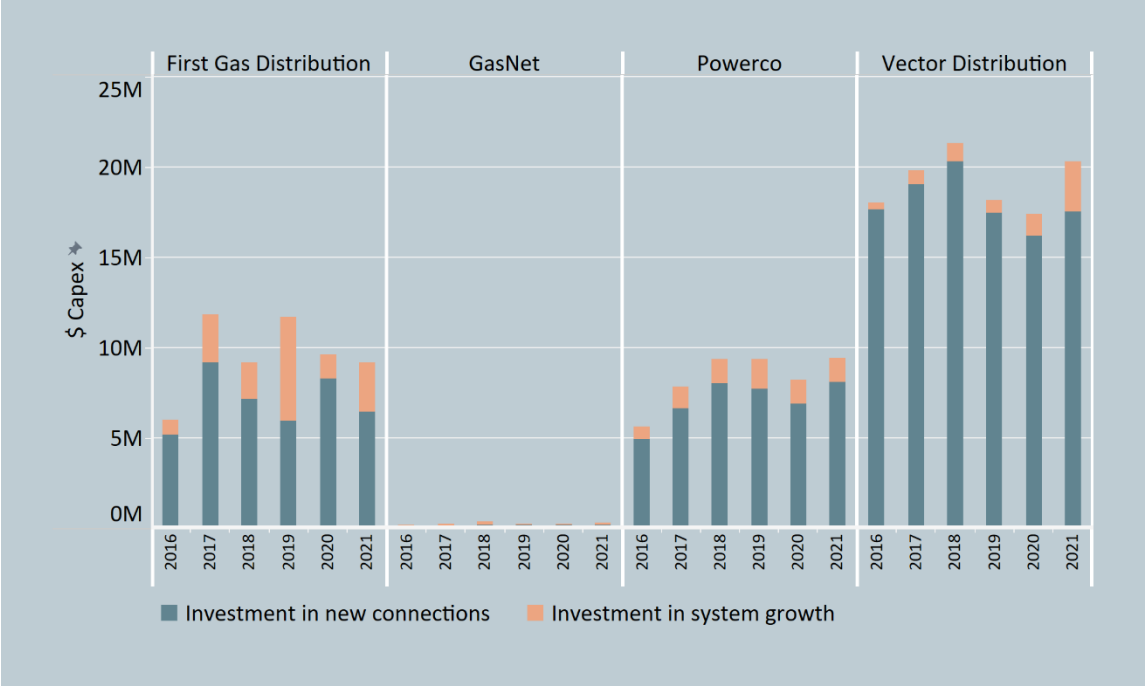


108. Investment in customer connections and system growth has grown by $12m and $5.2m respectively since 2014. Both customer connection capex and system growth capex saw marked increases in 2017, and customer connection capex appears to have plateaued from 2019 onward. In the case of system growth, capex occurred across a range of asset types.

109. The majority of system growth capex has been in medium-pressure pipelines, averaging $3.3m per year since 2014; a large portion of this occurred between 2017 and 2021. Intermediate-pressure is the next-largest component, averaging $0.8m per year since 2014.

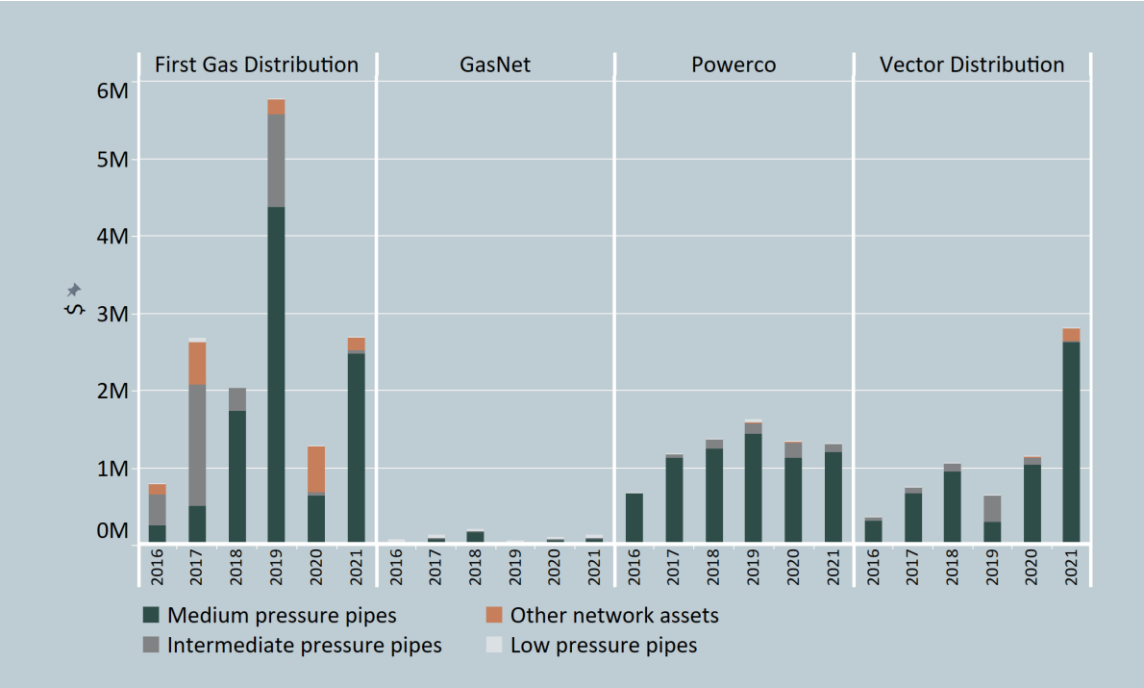
110. On an individual company basis, differences in capex programmes to support growth and ensure system capacity become more apparent. Figures 34 and 35 show capex for supporting growth and a breakdown of system growth investment for each local gas pipeline business.

Figure 34: Supporting growth capex for each local gas pipeline business, 2016-2021



111. Of the four local gas pipeline businesses, Vector invests the most in supporting growth capex and in customer connections specifically, averaging $18.1m per year in new connection capex between 2016 and 2021. Vector's supporting growth capex had been increasing in the three years 2016 to 2018, before decreasing for two years then increasing again in 2021. First Gas' and Powerco's supporting growth investment are the next highest: both have grown by approximately $3m to $4m since 2016.

Figure 35: Breakdown of investment in system growth by each local gas pipeline business, 2016-2021

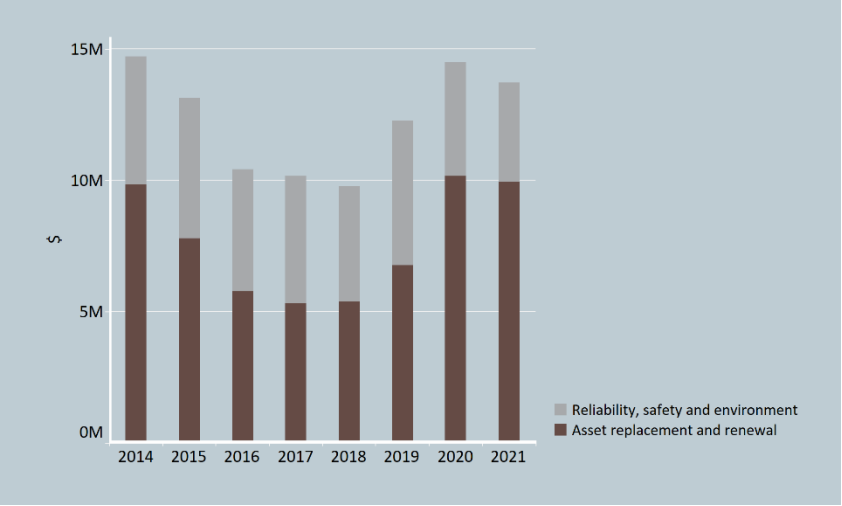


112. For investment in system growth specifically, Powerco, First Gas and Vector have been investing consistently in medium-pressure pipeline assets. First Gas has also had some notable intermediate-pressure pipeline investment in 2017, 2019 and 2021. First Gas' investment in system growth spiked in 2019 and 2021 which was associated with a restart of pipeline integrity upgrades, following a halt in 2018 to assess priority areas. Vector's investment in system growth has also increased in the 2021 year attributable to medium pressure pipe capex.

Investment in maintaining assets has been reasonably consistent over time, increasing slightly from 2019 onward

113. Collectively, local gas pipeline businesses have invested approximately $10m to $15m each year on maintaining their assets. Figure 36 shows the trend of expenditure in maintaining assets for all local gas pipeline businesses from 2014 to 2021.

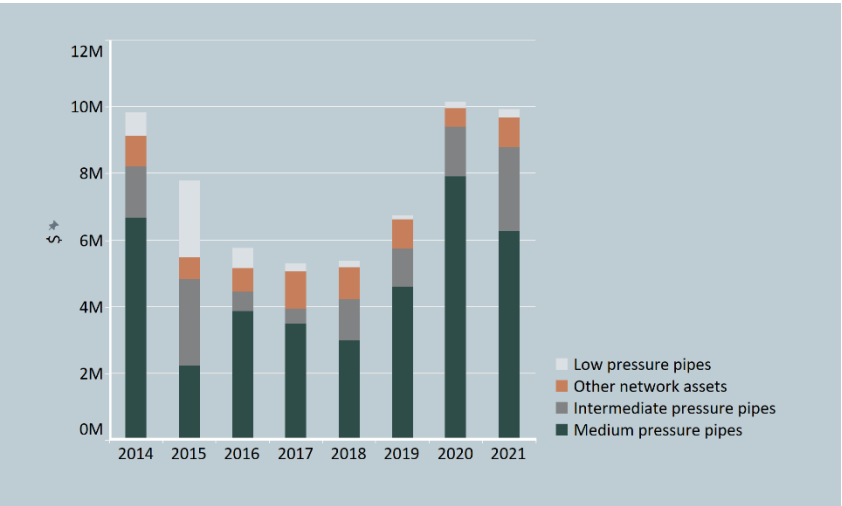
Figure 36: Maintaining assets capex for all local gas pipeline businesses, 2014-2021



114. The total investment in maintaining assets dropped slightly between 2016 and 2018, before rising in 2020 and levelling off slightly in 2021. This is largely because of movement in asset replacement and renewal capex, which is both larger and more variable year to year compared to reliability, safety and environment capex. Asset replacement and renewal capex has increased by $0.1m since 2014, while reliability, safety and environment capex has fallen by $1.1m over the same period.

115. As with system growth capex, the asset replacement and renewal capex occurred across a range of asset types, which can be seen in Figure 37.

Figure 37: Breakdown of investment in asset replacement and renewal capex by all local gas pipeline businesses, 2014-2021

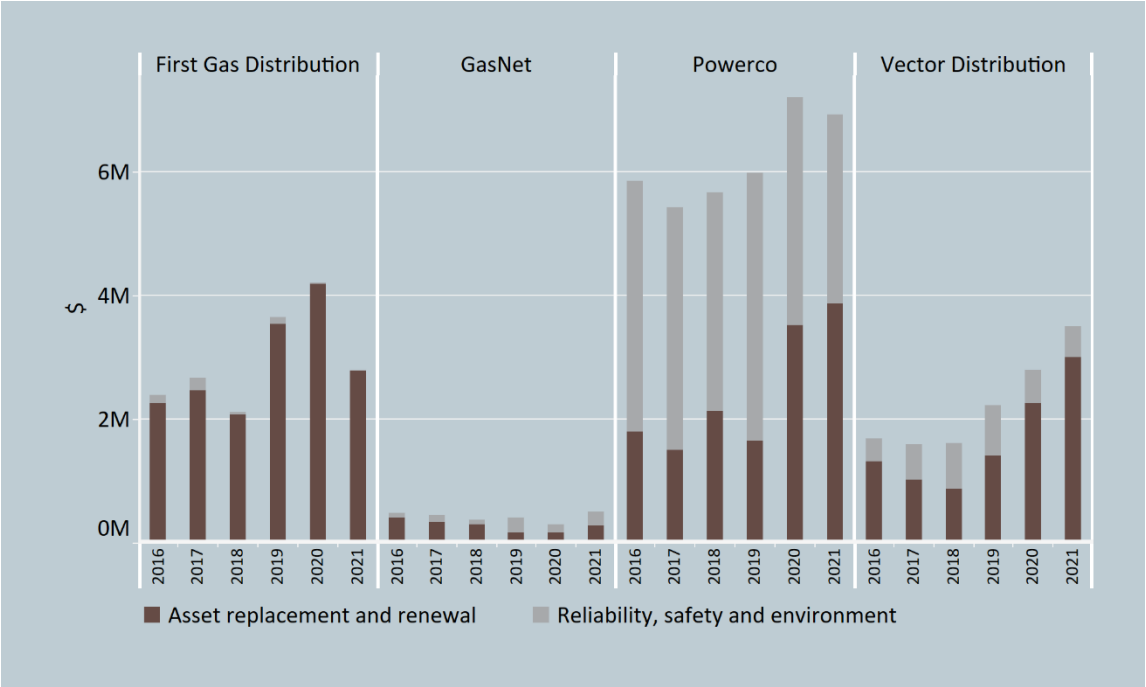


116. Asset replacement and renewal capex is mostly on medium-pressure pipeline assets, but the amount has fluctuated over time. Since 2014, between $2.2m and $7.9m has been invested in medium-pressure pipeline asset replacement and renewal per year. Intermediate-

pressure pipelines is the next-largest component, with $0.5m to $2.6m invested per year over the same period.

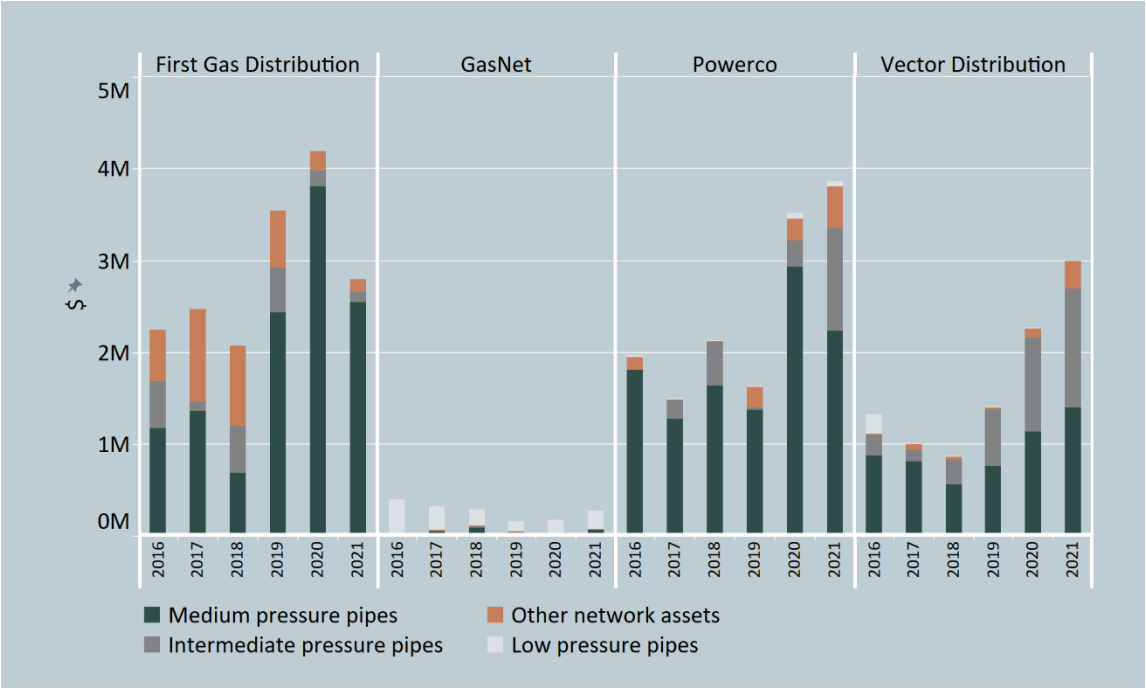
117. Figures 38 and 39 show the trend in capex in maintaining assets and a breakdown of asset replacement and renewal investment for each individual local gas pipeline business.

Figure 38: Maintaining assets capex for each local gas pipeline business, 2016-2021



118. Figure 38 shows that Powerco is spending the most of all the local gas pipeline businesses to maintain assets, at an average of $6m per year between 2016 and 2021, followed by First Gas which averaged $3m per year between 2016 and 2021. Capex on maintaining assets has been increasing since 2016 for First Gas ($0.1m or 3% per year on average), Powerco ($0.2 or 7% per year) and Vector ($0.4m or 22% per year), while GasNet's capex on maintaining assets has remained steady over the six year period from 2016.

Figure 39: Breakdown of investment in asset replacement and renewal by each local gas pipeline business, 2016-2021

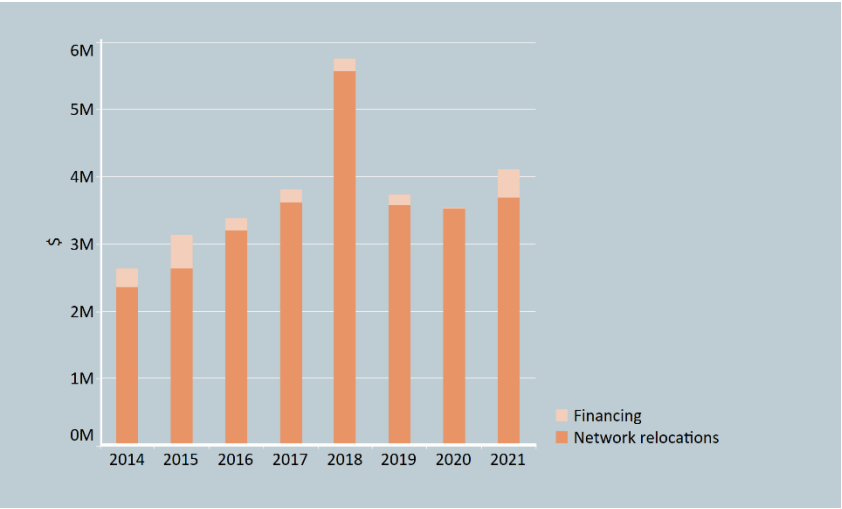


119. The gradual increases of medium-pressure asset renewal and replacement capex seen at the industry level in recent years are attributable to First Gas, Powerco and Vector. Vector's asset renewal and replacement capex has mostly been spent on medium-pressure pipelines since 2016, with an increasing focus on intermediate-pressure pipelines in recent years. GasNet's asset replacement and renewal expenditure has been targeted mainly at low-pressure pipelines, as these form the majority of its pipeline system.

Network relocation and financing costs form a comparatively small portion of capital expenditure

120. Changes to other ancillary investment have been driven primarily by network relocation. Figure 40 shows the trend in other ancillary investment, between 2014 and 2021.

Figure 40: Other ancillary investment across all local gas pipeline businesses, 2014-2021



121. Network relocation capex grew by $1.3m since 2014; it peaked in 2018 and has decreased since. Capitalised financing costs is the smallest of all capex categories, averaging $0.1 per year between 2014 and 2021.

Customers have been contributing more capital toward new connections and relocations on local gas pipelines over time

122. While network relocation is a relatively small portion of overall capex spend, it is a component of capex with a high degree of consumer visibility as relocation costs are often offset to a degree by capital contributions from the consumers who seek connection or relocation. Each local gas pipeline business has its own capital contribution policy that determines the contributions they require from customers. Figures 41 and 42 display how capital contributions have been allocated to the different capex categories, and the average capital contribution per new customer between 2014 and 2021.

Figure 41: Purpose of capital contributions across all local gas pipeline businesses, 2014-2021

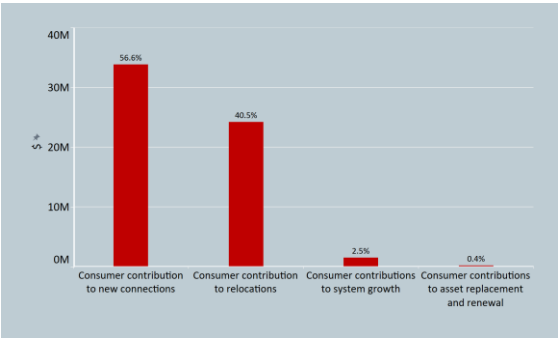
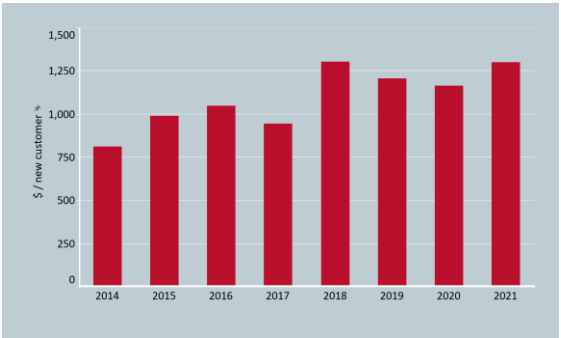


Figure 42: Capital contributions per new customer for all local gas pipeline businesses, 2014-2021



123. Capital contributions over the last eight years have been made primarily for new connections and network relocations. On a per-customer basis, capital contributions have increased from $813 by $489 in nominal terms or 60% since 2014. Figures 43 and 44 show the proportion of new connection and relocation capex that has been funded through capital contributions between 2014 and 2021. Capital contributions are shown in the narrow red bars on each graph, while the wider bars show the total expenditure of the category.

Figure 43: Proportion of new connection capex funded by capital contributions across all local gas pipeline businesses, 2014-2021

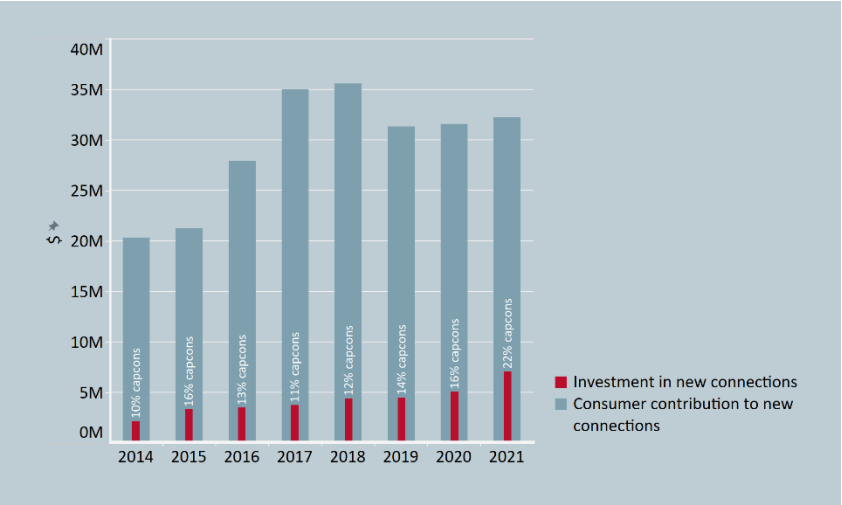
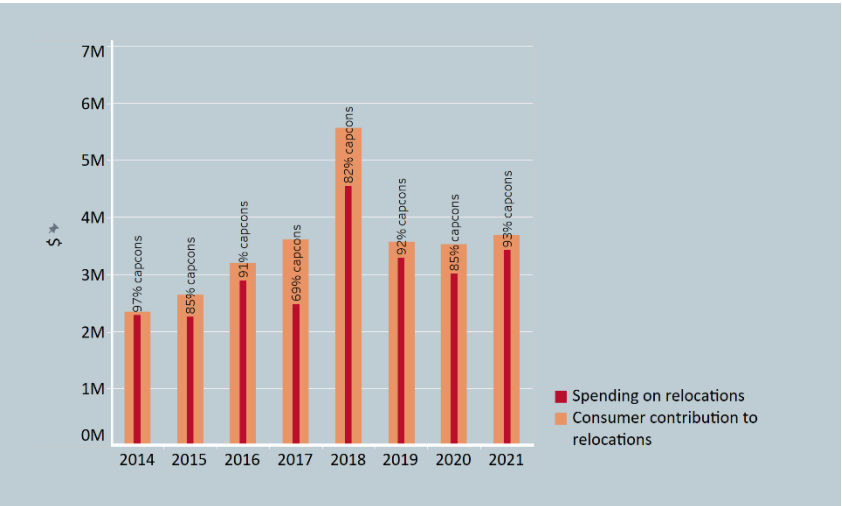


Figure 44: Proportion of network relocation capex funded by capital contributions across all local gas pipeline businesses, 2014-2021



124. While the majority of network relocation expenditure is recovered through capital contributions by consumers, the capital cost of new connections is mostly borne across the customer base of local gas pipeline businesses (ie, by new *and* existing customers). This is because the new connection and relocation capex not paid for by capital contributions is

recovered over time through the depreciation component of the local gas pipeline business' revenue.

125. The extent to which new customers contribute to connections or relocations varies across local gas pipeline businesses depending on their capital contribution policies. Since 2017, Vector (which has the highest investment in new connections) has changed its capital contribution policy to recover increasing amounts of new connection capex costs and, as they are responsible for the majority of new connections across all local gas pipeline businesses, the proportion of capital contributions to new connections has visibly increased from 2018 onwards. From July 2021, Vector changed its capital contribution policy to require a 100% contribution for new connections.

The cost of running all local gas pipeline businesses has averaged $38m per year between 2014 and 2021

126. Around 28% of local gas pipeline businesses' revenue between 2014 and 2021, averaging $38m per year, was used to operate their networks and businesses on a day-to-day basis. In 2021, the cost of running local gas pipeline businesses had collectively increased by $11m since 2014, to $45m.

127. As with capex, opex occurs over a range of different categories. Table 4 describes the different opex categories and the broad purpose of the expenditure that falls within it.

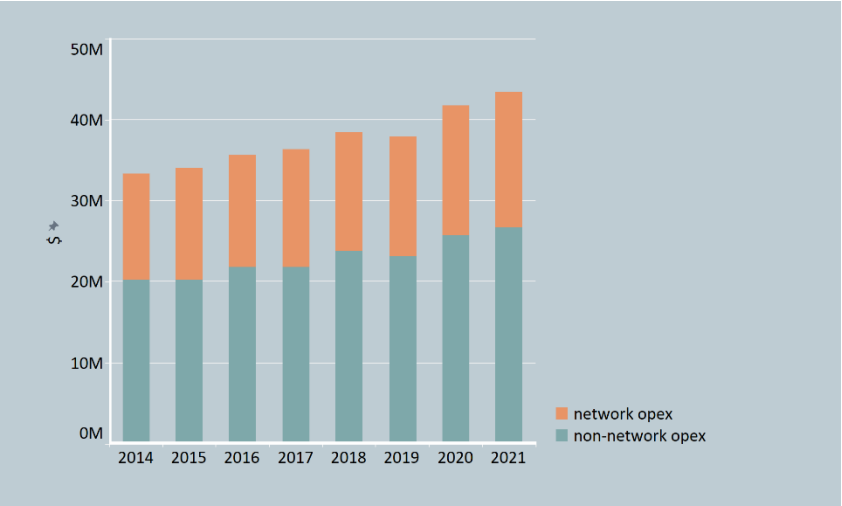
Table 4: Mapping of categories and purpose of opex

Operational expenditure category in ID	Opex type	Purpose of opex
Asset replacement and renewal (ARR)	Network	To replace, refurbish or renew items that are asset components to ensure quality of supply
Service interruptions, incidents and emergencies (interruptions)	Network	Remedial work responding to an unplanned instantaneous event that impairs the normal operation of network assets
Routine and corrective maintenance and inspection (routine maintenance)	Network	Planned work to rectify faults (beyond initial fault response), routine inspections and testing
System operations and network support (SONS)	Non-network	Managing and operating the network, eg, control centre and network planning activities
Business support	Non-network	Administration or opex that is not directly incurred in the physical operation and maintenance of the network, eg, corporate activities
Term credit spread differential (TCSD) allowance	Other	An allowance to cover the notional additional costs of raising long term debt (to the extent the firm has issued such debt).

Network and non-network operating costs have both been increasing since 2014

128. In general, non-network operating costs exceeds network opex spend. Figure 45 shows the split of network and non-network opex across all local gas pipeline businesses between 2014 and 2021.

Figure 45: Split of network vs non-network opex for all local gas pipeline businesses, 2014-2021



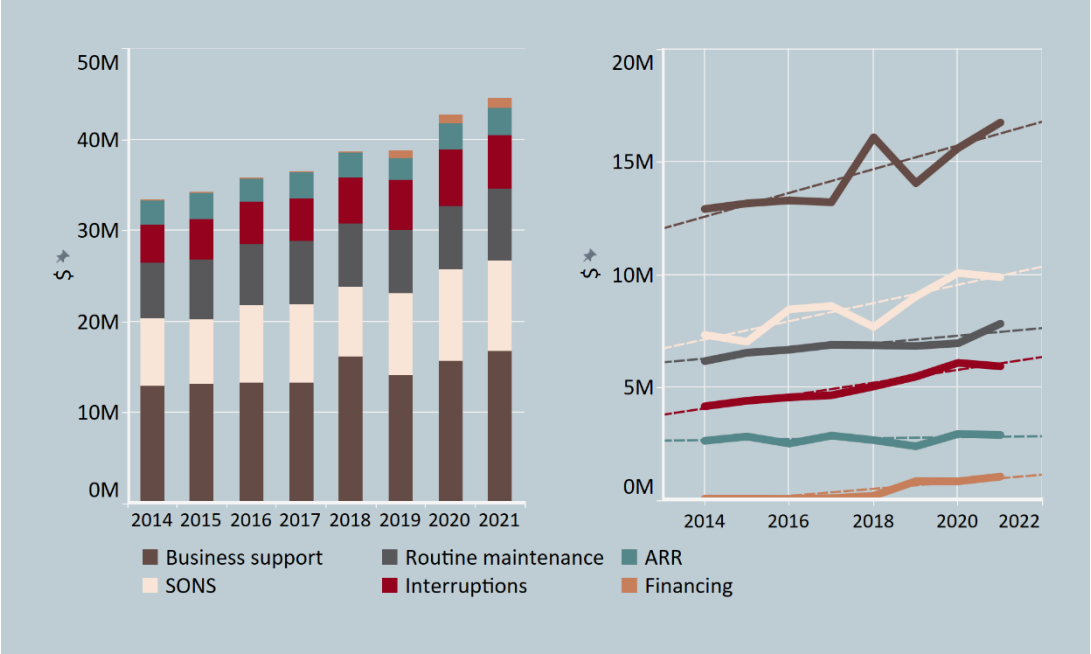
129. Network opex has increased by approximately $0.5m or 4% on average per year since 2014. Non-network opex has grown by closer to $0.9m or 4% on average per year over the same period. The rate of growth in network and non-network opex exceeded the rate of input cost inflation for electricity and gas supply over the same period, which averaged 2.8% per year between 2014 and 2021.[34]

130. Non-network opex is composed of 'system operations and network support' spending, and 'business support' costs, which formed 23% and 38% of total opex respectively between 2014 and 2021. Figures 46 and 47 show opex by expenditure category and the trend of each between 2014 and 2021.

[34] Stats NZ Infoshare, table reference: PPI021AA, limited to ANZSIC06 level 3 of Electricity and Gas Supply (viewed on 30 November 2022).

Figure 46: Opex by expenditure category for all local gas pipeline businesses, 2014-2021

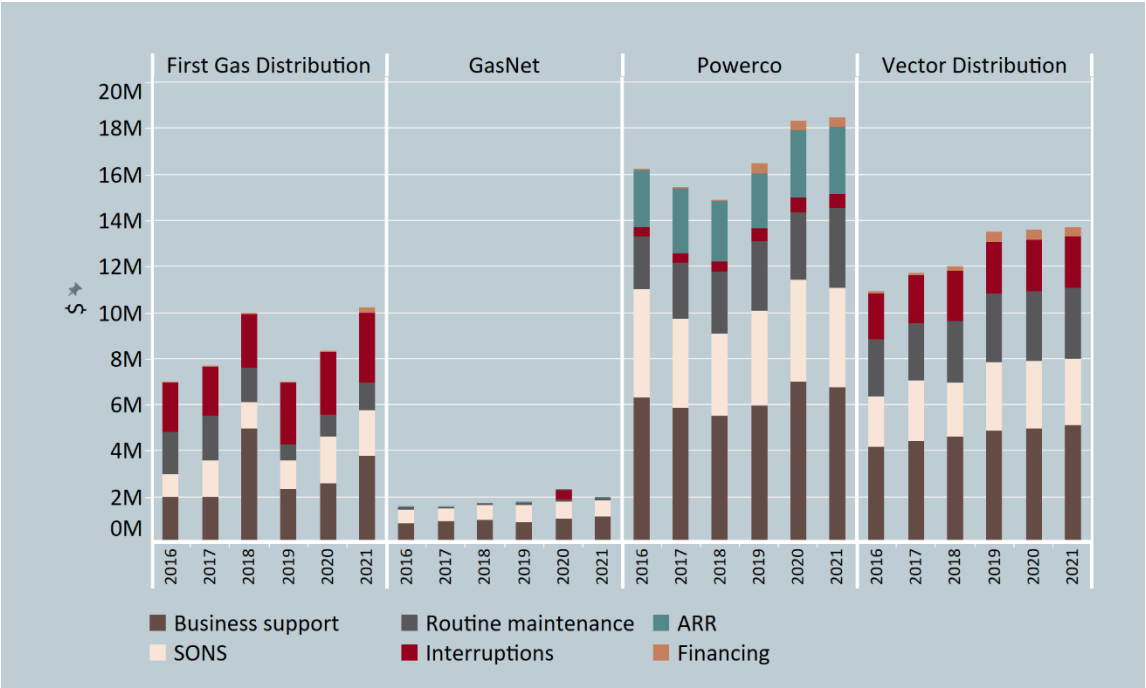
Figure 47: Trends in opex categories for all local gas pipeline businesses, 2014-2021



131. At an industry level, the largest components of opex are business support, system operations and network support and routine maintenance spend, which have been fairly stable over time. While all opex components have been trending upward since 2014, business support, system operations and network support, and interruptions opex have been increasing the most each year, at $0.6m (4%), $0.4m (4%) and $0.3m (5%) on average respectively per year since 2014. The 'business support' and 'system operations and network support' components of opex are considered 'non-network', in that they do not immediately relate to local gas pipeline assets.

132. In the case of opex, trends in each of the components for individual local gas pipeline businesses show differences in spending behaviour as well as the impacts of network-specific events. Figure 48 displays the opex by component across each of the local gas pipeline businesses between 2016 and 2021.

Figure 48: Opex by expenditure category for each local gas pipeline business, 2016-2021

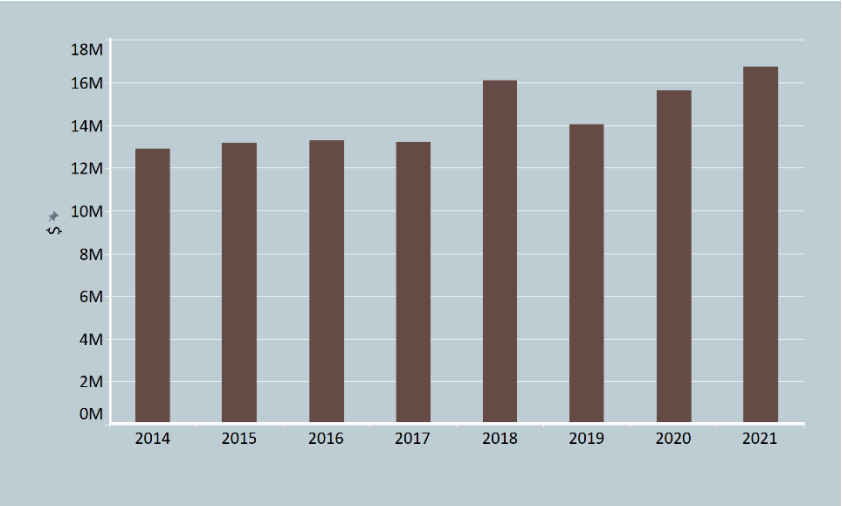


133. Powerco spends the most of all local gas pipeline businesses on its day-to-day operations, averaging $16m per year between 2016 and 2021. This opex is mostly on non-network activities: system operations and network support opex and business support opex, which have averaged $6m and $4m respectively over the same period. First Gas and Vector have seen the most growth in opex since 2016, increasing by $0.6m and $0.5m respectively per year. Powerco is the only local gas pipeline business that spends on asset replacement and renewal opex activities, but this is likely due to how each local gas pipeline business chooses to categorise the opex within the disclosures themselves. GasNet's relatively significant opex increase in 2020 came about through an increase in interruptions opex, which decreased in 2021

Local gas pipeline businesses collectively have spent $3.9m or 30% more on business support activities since 2014

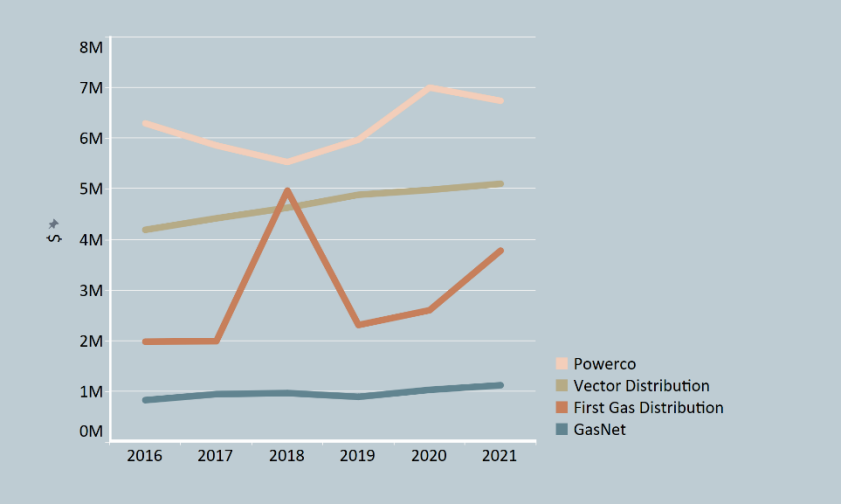
134. Business support costs are the largest component of opex across all local gas pipeline businesses. Figures 49 and 50 show business support opex across all local gas pipeline businesses between 2014 and 2021, and for each local gas pipeline business between 2016 and 2021.

Figure 49: Business support opex for all local gas pipeline businesses, 2014-2021



135. Business support costs across local gas pipeline businesses have grown by $3.9m or 30% since 2014. At an industry level, business support opex appears to be increasing in variability in later years, but this is again due to large changes for individual local gas pipeline businesses.

Figure 50: Business support opex for each local gas pipeline business, 2016-2021



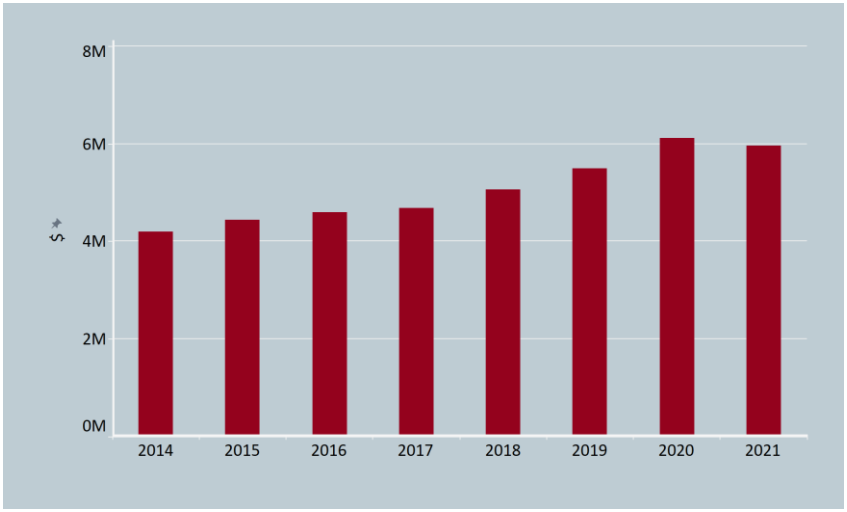
136. First Gas and Vector bear the largest amounts of business support opex and both have seen increases of $1.8m and $0.9m respectively, since 2016. Vector and GasNet have seen steady rises, but First Gas and Powerco have noticeably different trends. First Gas' business support costs spiked in 2018 due to a provision for settlement of claims associated with gas pipeline acquisitions, while the smaller increase in 2021 is due to the change in accounting treatment for Software as a Service (**SaaS**) which prior to this year was categorised as capex. Powerco's business support opex rose sharply in 2020, decreasing slightly from this high in 2021. Business support opex is made up of costs that are not directly attributable to specific

activities, so drivers of change from year to year for individual gas pipeline businesses are not always clear.

The cost of interruptions and emergencies on local gas pipelines have been increasing since 2014

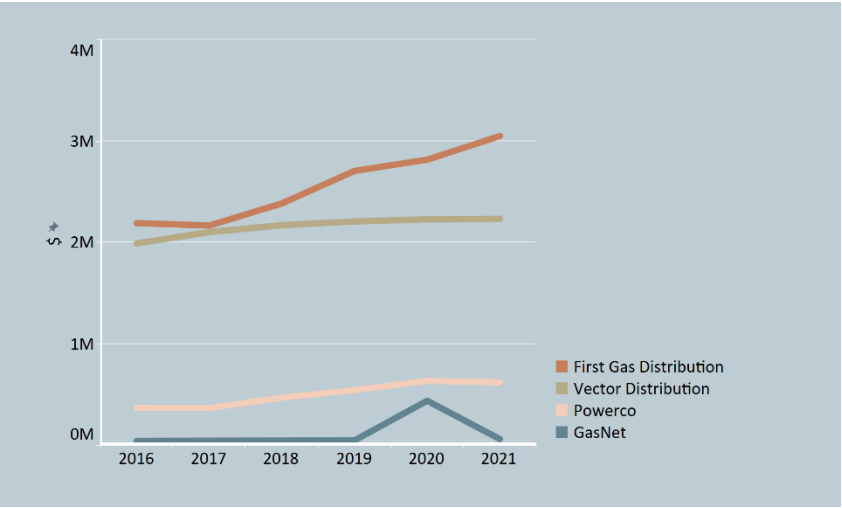
137. Interruptions opex has been trending upward steadily since 2014. Interruptions opex is the cost associated with reactive works, in response to an unplanned event that impairs the normal operation of the network. It does not include expenditure on work to prevent or mitigate the impact of such events. Figures 51 and 52 show interruptions opex across all local gas pipeline businesses between 2014 and 2021, and for each local gas pipeline business between 2016 and 2021.

Figure 51: Service interruptions, incidents and emergencies opex for all local gas pipeline businesses, 2014-2021



138. Interruptions opex across all local gas pipeline businesses has increased by $1.9m in absolute terms or 43% since 2014. In part, this is related to changes in the way that individual local gas pipeline businesses have allocated costs across categories.

Figure 52: Service interruptions, incidents and emergencies opex for each local gas pipeline business, 2016-2021



139. First Gas has seen the largest increase in interruptions opex, of $0.8m or 36% since 2016. This growth has occurred between 2018 and 2021, due to a revision in contract structure, which recategorised some routine maintenance expenditure as reactive works. In contrast, the 2020 spike in GasNet's interruptions opex was incurred as a result of a water leak interrupting customer supply in early 2020, but overall GasNet has the lowest increase in their interruptions since 2014 at $0.1m. Powerco and Vector have both had increases of $0.2m in their interruptions opex since 2016.

We collect a range of metrics representing the quality of service on local gas pipelines, all of which have generally been improving over time

140. We collect a range of metrics to help describe the quality of the service provided to consumers by local gas pipeline businesses. Analysing quality is a critical aspect of ensuring that the services provided meet consumer expectations of services, including reliability, consistent with what we would expect of competitive market conditions. Three key statistics we collect are:

140.1 the total number of outages that occurred;

140.2 the average number of outages experienced across all customers, represented by the System Average Interruption Frequency Index (**SAIFI**); and

140.3 the average length of outage time across all customers, represented by the System Average Interruption Duration Index (**SAIDI**).

141. In general, the total number of outages, and the average number and duration of outages experienced by customers has been decreasing since 2014. Historically, the source of most outages has been the local gas pipeline business itself, followed by third-party interruptions.

142. We also collect information relating to the number of emergencies experienced on local gas pipeline networks and the number of customer complaints associated with emergencies, as well as network condition and integrity measures such as the number of publicly reported gas escapes, self-reported leaks and third-party damage events. These metrics have all been generally trending downward since 2014.

Local gas pipeline businesses have been the predominant source of their planned and unplanned outages

143. Outages on local gas pipeline networks can be broken down by source. Figures 53 and 54 show the breakdown of outages by origin across all local gas pipeline businesses between 2014 and 2021, and the breakdown of outages by origin for each local gas pipeline business between 2016 and 2021.

Figure 53: Breakdown of outages by origin across all local gas pipeline businesses, 2014-2021

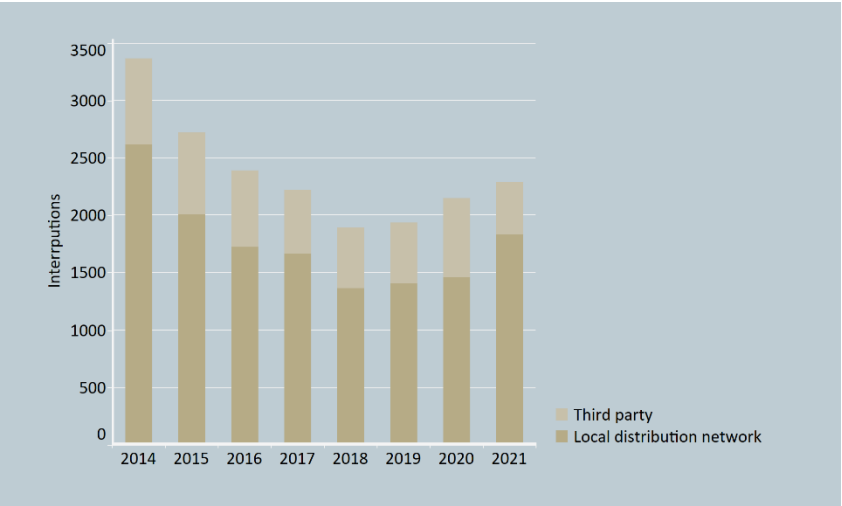
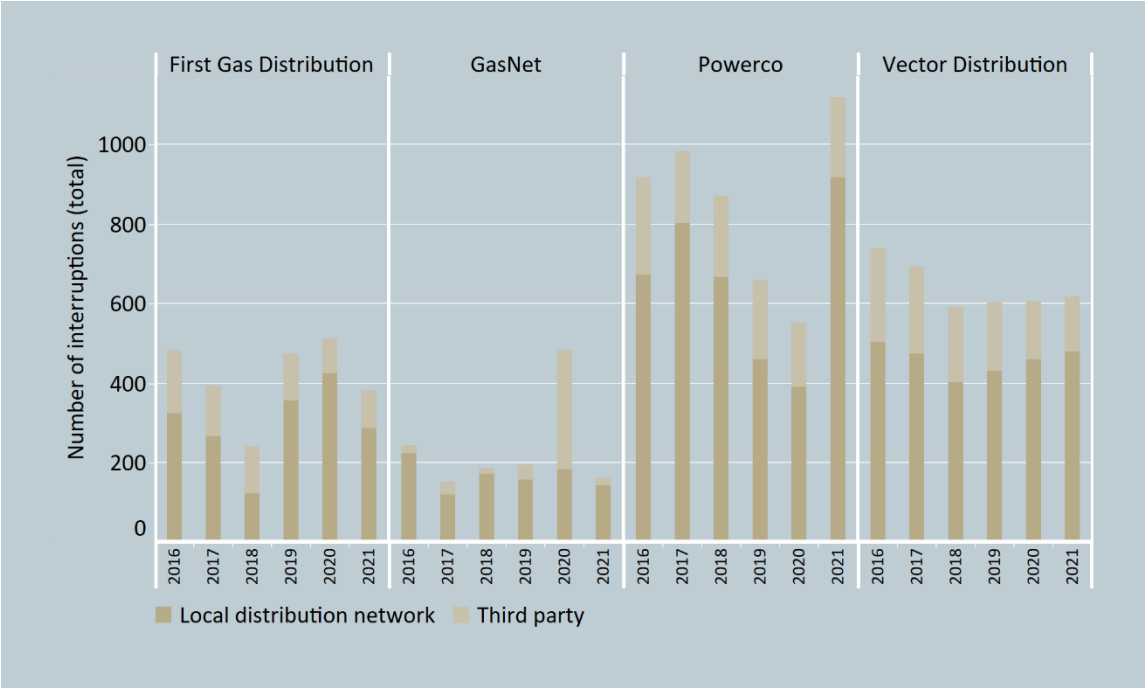


Figure 54: Breakdown of outages by origin for each local gas pipeline business, 2016-2021



144. Local gas pipeline businesses are the predominant source of outages (true for all years and all local gas pipeline businesses, except for GasNet in 2020), followed by third parties. Outages caused by the transmission network have not occurred at all since 2014. With the exception of Powerco, outages caused by the local gas pipeline business, and third parties have both been generally trending downward over time.

145. Powerco has had the most interruptions with causes attributed to the local gas pipeline business and attributed to third parties on average over the last six years, but the trend in interruptions had decreased over the three years between 2018 to 2020. The 2021 increase is due to planned outages for replacement works of pre-1985 pipes in the Hutt Valley and Porirua region. Outages relating to third parties have decreased on all networks except for GasNet, which spiked in 2020 due to a water leak flooding 9km of gas mains and service pipes.

The number of emergencies experienced by customers, and the number of customer complaints has decreased significantly since 2014

146. Local gas pipeline businesses report the number of emergencies on their networks, shown in Figures 55 and 56.

Figure 55: Number of emergencies across all local gas pipeline businesses, 2014-2021

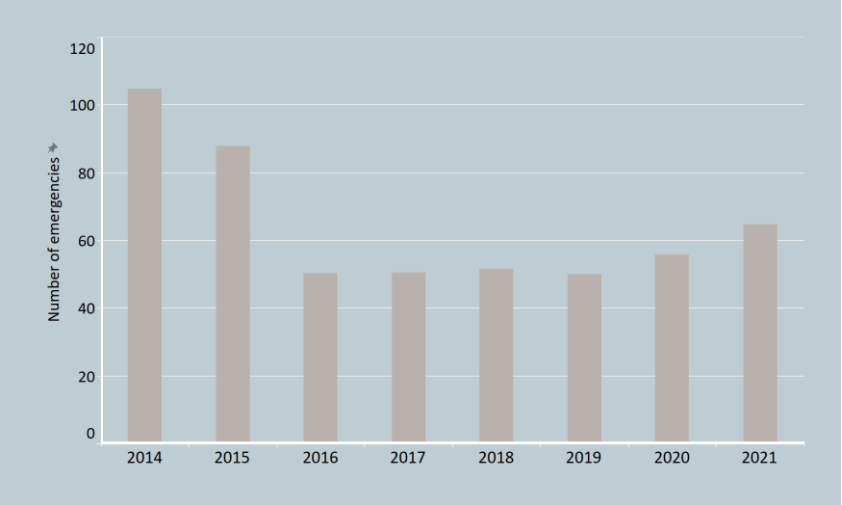
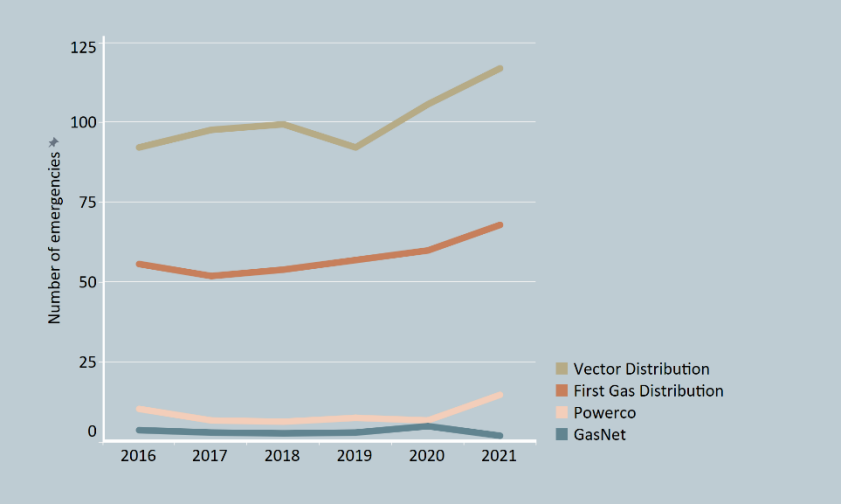


Figure 56: Number of emergencies for each local gas pipeline business, 2016-2021



147. The number of emergencies across local gas pipeline businesses fell by 38% between 2014 and 2021 but there has been a small increase in more recent years. From a customer-facing perspective, the proportion of emergencies responded to within three hours across all gas pipeline businesses for all reporting periods has been 100%.

148. The number of emergencies on Vector's network has been trending up slightly while still remaining reasonably consistent as a proportion of Vector's customer base. Emergencies relate to active involvement of emergency services (eg, fire service, ambulance), interruption to more than five customers, or evacuation of premises, so network emergencies are generally more likely to occur on Vector's network because it is the most consumer-dense of all the local gas pipeline businesses. While Vector's emergencies have been trending up slightly the number of emergencies per customer remain very small at 0.04% in 2021. Powerco's number of emergencies has dropped since 2016 but appears to have been relatively stable since 2017, while First Gas' and GasNet's number of emergencies have been relatively flat over all reporting periods.

149. Local gas pipeline businesses also disclose the average number of complaints per consumer on their networks. Figure 57 shows the trend over time across all local gas pipeline businesses between 2014 and 2021, while Figure 58 shows the trend over time for each local gas pipeline business between 2016 and 2021. As the frequency of complaints per consumer is small, this metric is given in terms of complaints per 1000 consumers.

Figure 57: Average number of complaints per 1000 consumers across all local gas pipeline businesses, 2014-2021

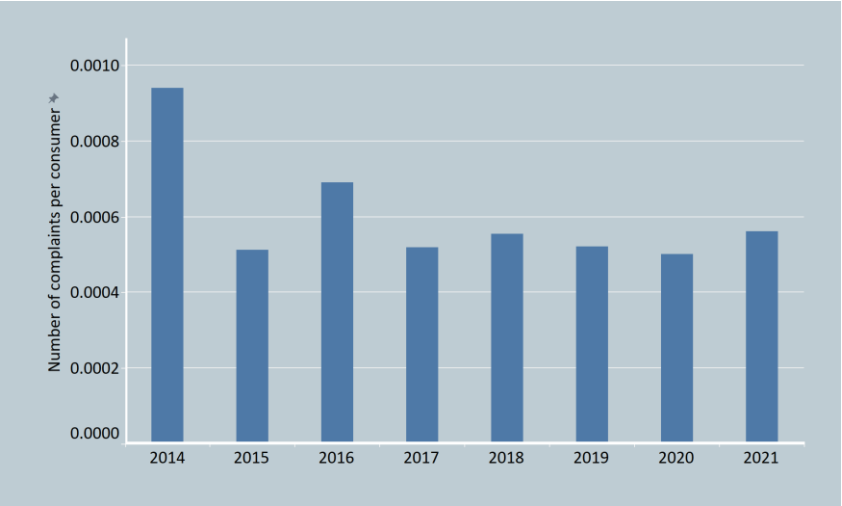
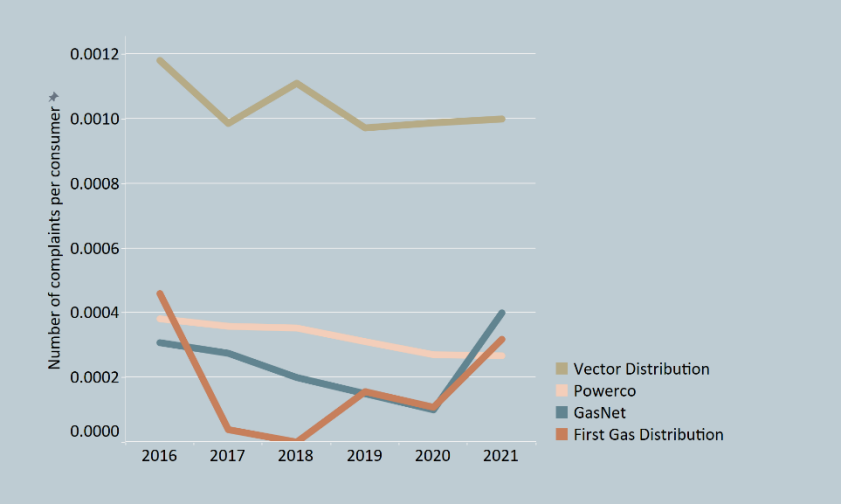


Figure 58: Average number of complaints per 1000 consumers for each local gas pipeline business, 2016-2020



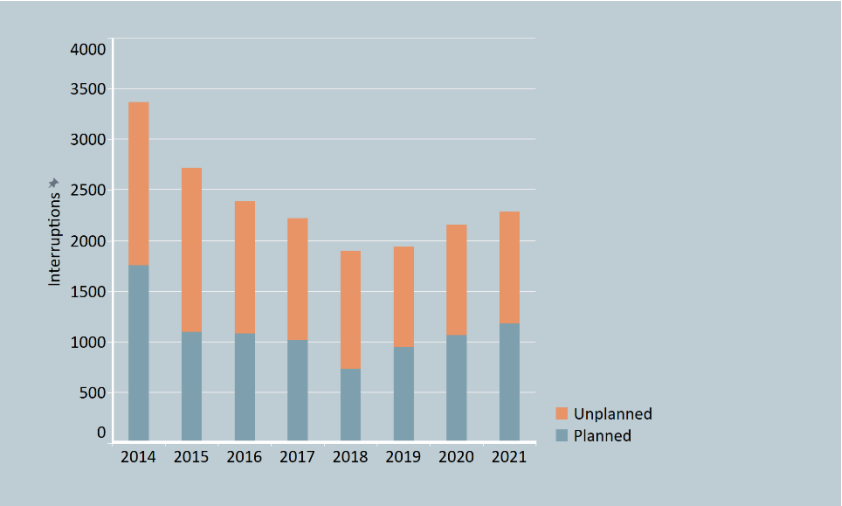
150. The average number of complaints per total number of consumers has decreased between 2014 and 2017 and has remained reasonably stable since then. Vector receives the most complaints per consumer on its network, consistent with the number of emergencies reported on its network. Complaints by consumers on Powerco's and GasNet's networks

have been decreasing slowly since 2016, and First Gas' complaints per consumer have also generally decreased.

The total number of outages occurring on local gas pipeline networks has decreased markedly since 2014

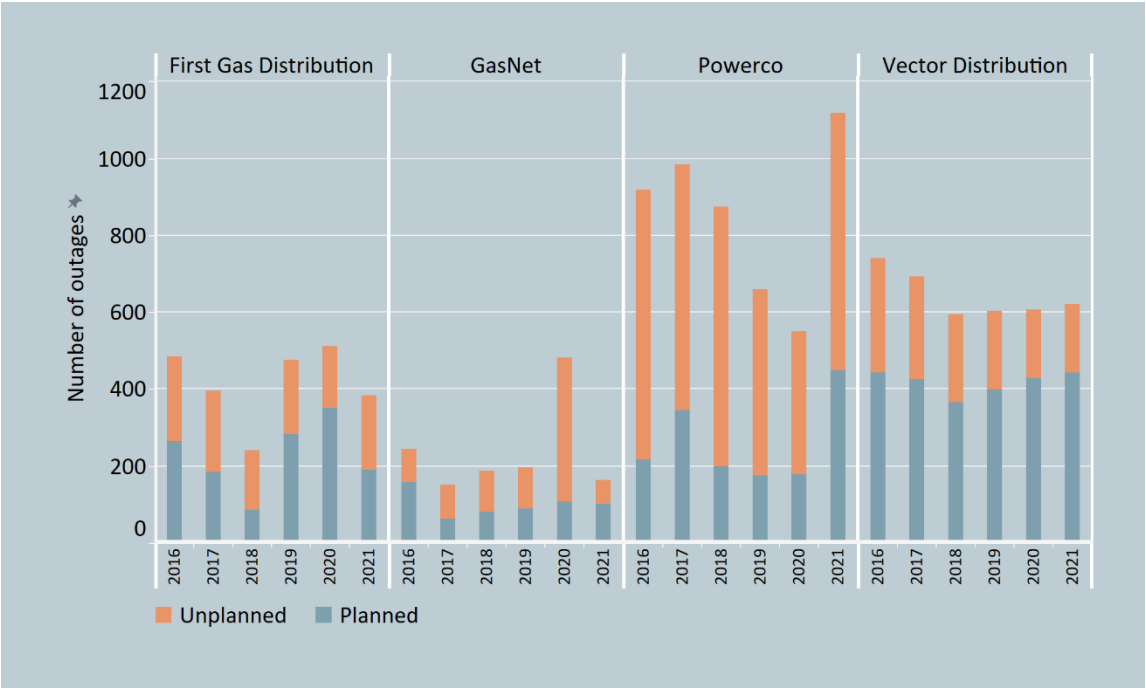
151. The recorded outages distinguish between planned and unplanned outages, so it is possible to display these statistics for each type of outage. Figure 59 shows the total number of outages for all local gas pipeline businesses between 2014 and 2021, and Figure 60 shows the total number of outages for each local gas pipeline business between 2016 and 2021.

Figure 59: Number of planned and unplanned outages for all local gas pipeline businesses, 2014-2021



152. The number of outages across all local gas pipeline businesses has generally been trending downward for both planned and unplanned interruptions. In 2014, there were a larger number of planned outages than unplanned outages, but since 2015 unplanned outages have slightly outnumbered planned outages per year.

Figure 60: Number of planned and unplanned outages for each local gas pipeline business, 2016-2021



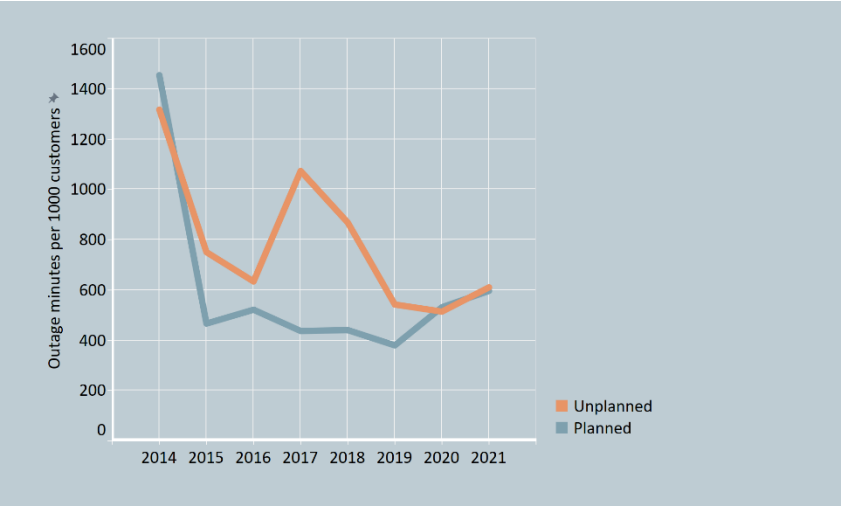
153. The number of outages on a network is generally proportional to network size - but between 2016 and 2018, and again in 2021, Powerco's were disproportionately high. In 2017 and 2021, this was driven by an increase in its planned outages, in preparation for a pressure upgrade project in Wellington. In 2021 this was due to planned interruptions for the replacement of corroded risers in the Wellington, Hutt Valley and Porirua network region. A significant proportion of the unplanned interruptions result from leaks found on risers. First Gas saw a reduction in the number of planned outages on its network in 2018, due to its work programme review and fewer asset renewal and replacement programmes than in the year prior.[35] The increased number of outages on GasNet's network in 2020 is consistent with its elevated interruptions opex, resulting from a water leak flooding 9km of gas mains and service pipes.

The average duration of outages experienced by customers of local gas pipeline businesses has generally decreased or remained flat since 2014 on all networks except GasNet

154. Figure 61 shows the average length of outage time experienced across all customers for all local gas pipeline businesses between 2014 and 2021, and Figure 62 shows the average length of outage time experienced across all customers for each local gas pipeline business between 2016 and 2021. Because the duration of outages on local gas pipeline businesses is short, the metric is given in terms of outage minutes per 1000 customers.

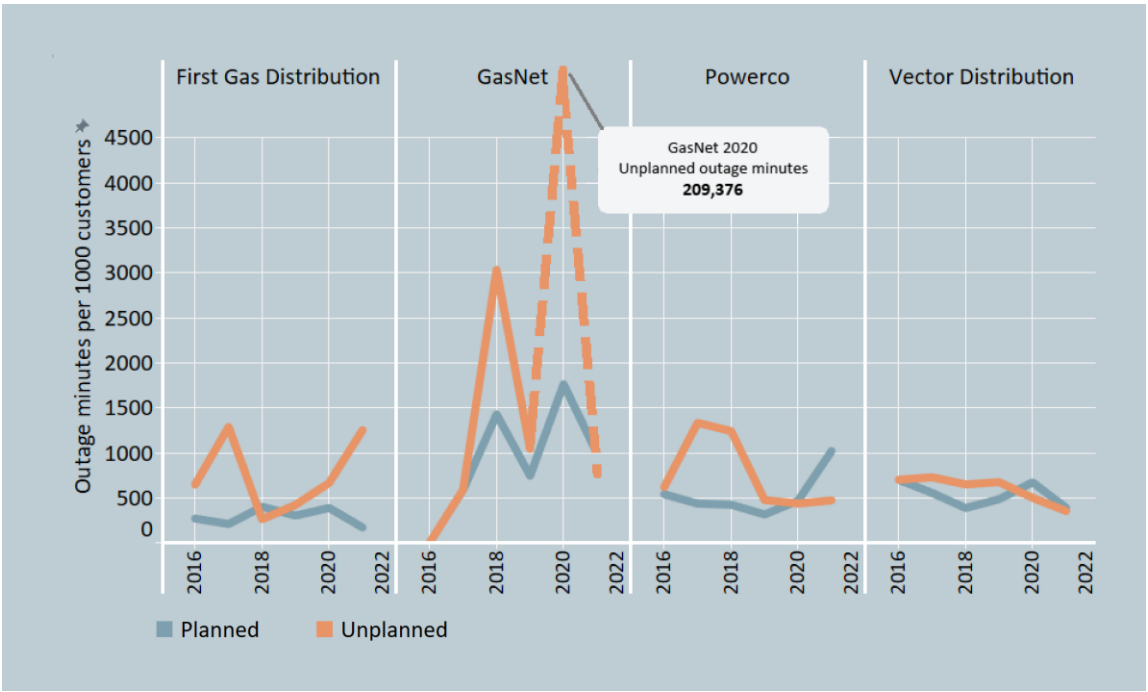
[35] Asset replacement and programmes require more planned outages than new subdivision works, as they relate to existing network connections.

Figure 61: Average length of planned and unplanned outage time per 1000 customers for all local gas pipeline businesses, 2014-2021



155. On a per-customer basis, the duration of outages per 1000 customers has decreased since 2014. The duration of planned outages per 1000 customers has remained relatively flat since 2015, while unplanned outage duration per 1000 customers has fluctuated over time. As a measure, the average length of outage time across all customers (ie, SAIDI) can be heavily impacted by small numbers of long duration events even if the event impacted a small number of customers, so it is important to consider the statistic in the context of the events and activities that have occurred during the reporting period.

Figure 62: Average length of planned and unplanned outage time per 1000 customers for each local gas pipeline business, 2016-2021



156. The average duration of planned and unplanned outages per 1000 customers have fallen slightly for Powerco between 2016 and 2020, rising again in 2021 due to replacement of corroded risers as described in paragraph 153 above. Increases in unplanned outage duration per 1000 customers in 2017 and 2018 are due to the following:

    156.1 In 2017, a third-party damage event in the Hutt Valley and Porirua saw the supply to 258 customers interrupted for more than five hours.

    156.2 In 2018, an operating error during planned work in the Hutt Valley resulted in a supply interruption for 266 customers for almost six hours.

157. These events also impacted the metric for the industry overall, shown in Figure 61.

158. First Gas saw a reduction in the duration of unplanned outages per 1000 customers on its network in 2018 due to a reduced number and duration of temporary disconnections (for safety purposes or as agreed with the customer), but it has been trending upward since. The duration of its planned outages per 1000 customers has been reasonably flat since 2016.

159. Vector has seen a slight decrease in the duration of unplanned outages per 1000 customers on its network over time, but had an increase in the duration of planned outages per 1000 customers in 2020 and 2021. This was due to a small number of outages that had relatively long durations, and an increase in the number of outages associated with riser valve replacements.

160. Prior to 2021, the duration of planned and unplanned outages per 1000 customers on GasNet's network has been increasing over time. The high duration of unplanned outages in 2018 was associated with water infiltrating a low-pressure gas main, interrupting supply to 24 properties for around 20 hours, and the duration of unplanned interruptions in 2020 is consistent with elevated interruptions opex, resulting from a water leak flooding 9km of gas mains and service pipes. Planned outage duration was also highest in these two years due to the occurrence of more main renewal activities which tend to be longer in duration.

The average frequency of outages experienced by customers of local gas pipeline businesses has decreased since 2014 on all networks except GasNet

161. Figures 63 and 64 show the average number of outages experienced across all customers across all local gas pipeline businesses between 2014 and 2021, and for each local gas pipeline business between 2016 and 2021. As with the duration of outages on local gas pipeline businesses, the frequency of outages per customer is small so this metric is given in terms of outages per 1000 customers.

Figure 63: Average number of planned and unplanned outages per 1000 customers for all local gas pipeline businesses, 2014-2021

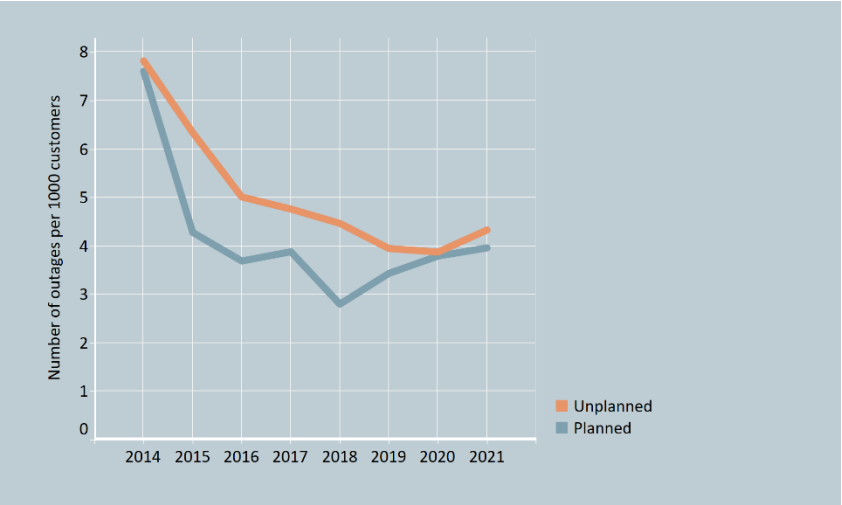
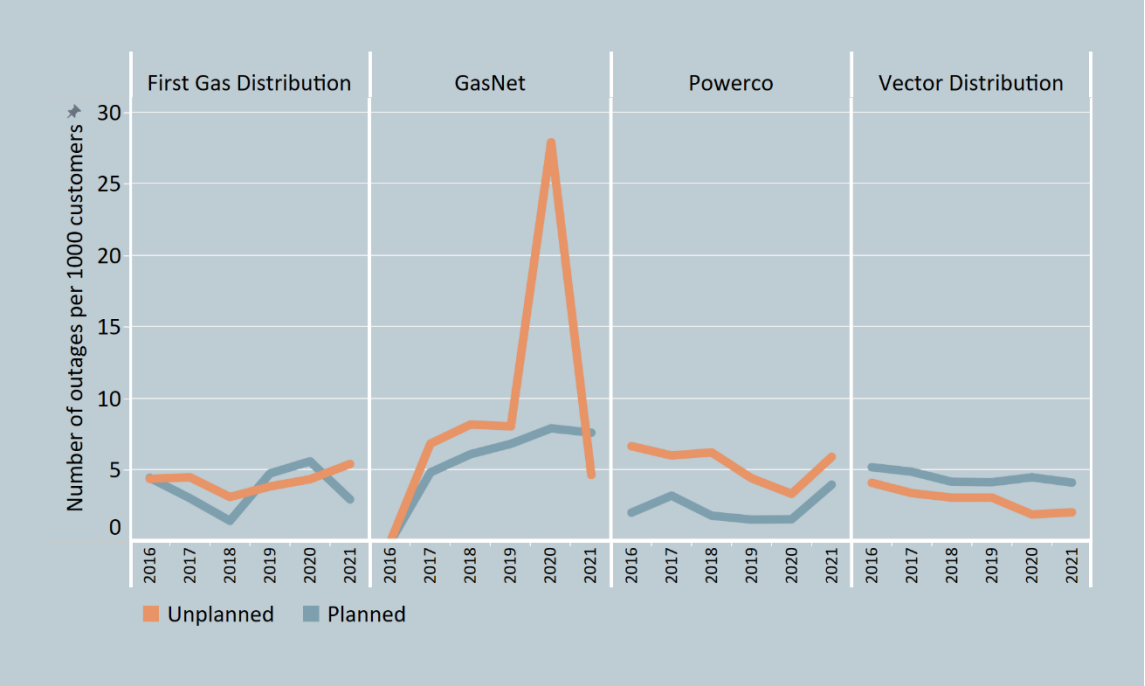


Figure 64: Average number of planned and unplanned outages per 1000 customers for each local gas pipeline business, 2016-2021



162. The average number of planned and unplanned outages per 1000 customers has generally decreased since 2014. The average number of planned outages per 1000 customers has remained relatively flat since 2015, while the unplanned outage frequency per 1000 customers fluctuated briefly in 2018. The small increase in 2021 is mainly driven by Powerco's planned and unplanned outages as described in paragraph 153 above.

163. Overall, the frequency of outages per 1000 customers has fallen for Vector and Powerco between 2016 and 2021, and as the largest networks they have generally driven the decrease in the industry trend. Vector's frequency of planned and unplanned outages per 1000 customers has been fairly steady over time while Powerco had a small uptick in both planned and unplanned outages as described in paragraph 153.

164. First Gas' frequency of planned outages per 1000 customers has been trending upwards over the period 2018 to 2020, while falling in 2021. First Gas saw a reduction in the frequency of planned outages per 1000 customers on its network in 2018, due to its work programme review and fewer asset renewal and replacement programmes than in the year prior. Its frequency of unplanned outages per 1000 customers has trended slightly upward.

165. The higher frequency of unplanned outages per 1000 customers on GasNet's network in 2020 is consistent with increased duration of unplanned outages per 1000 customers and elevated interruptions opex, resulting from flooding of gas mains and service pipes. In 2021 the frequency of GasNet's unplanned outages dropped back down to the levels of previous years while the trend of planned outages has started to flatten out.

Measures of network integrity have been improving across most local gas pipeline businesses over time

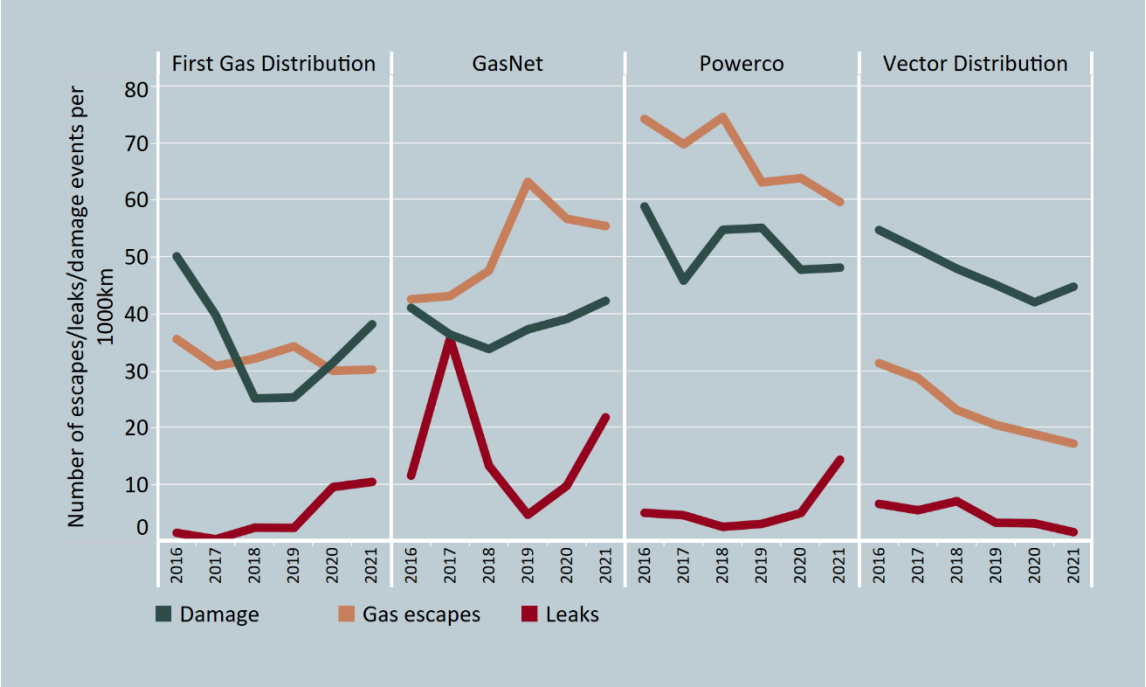
166. The number of publicly reported gas escapes, self-reported leaks found through survey, and third-party damage, are indicators of network condition and integrity. Figures 65 and 66 show the publicly reported gas escapes, self-reported leaks and third-party damage events across all local gas pipeline businesses between 2014 and 2020, and publicly reported gas escapes, self-reported leaks and third-party damage events for each local gas pipeline business between 2016 and 2021.

Figure 65: Publicly reported gas escapes, self-reported leaks and third-party damage events across all local gas pipeline businesses, 2014-2021

167. Publicly reported gas escapes and third-party damage events per 1000km of system length across all local gas pipeline businesses have been declining steadily since 2014, by 39% and

21% respectively. The number of leaks per 1000km of system length (self-reported and discovered through survey) has been relatively low and stable since 2014 with a small increase in leaks in 2021).

Figure 66: Publicly reported gas escapes, self-reported leaks and third-party damage events for each local gas pipeline business, 2016-2021



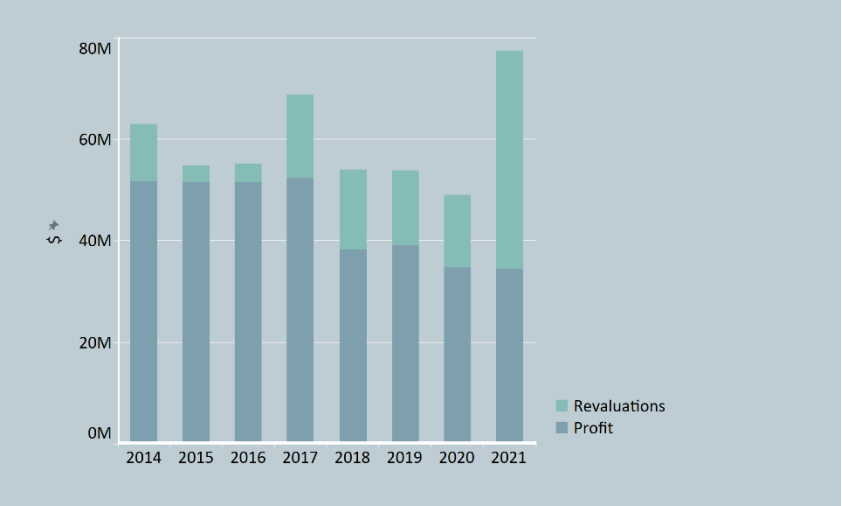
168. Powerco has experienced the highest number of publicly reported gas escapes and third-party damage events per 1000km of system length, but this has been decreasing since 2016. Vector and First Gas have also seen decreases in publicly reported gas escapes and third-party damage events per 1000km of system length over the same period. GasNet, however, has seen an increase in reported gas escapes in 2019 and 2021, while the number of third-party damage events per 1000km of system length has remained fairly stable on its network between 2016 and 2021.

169. The trend in the number of self-reported leaks per 1000km of system length for each local gas pipeline business has been reasonably flat since 2016. GasNet had an increase in self-reported leaks in 2017 due to an area survey which included much of the company's low pressure metallic network.

Customers on average are paying $77 less towards local gas pipeline businesses' profit, which has not been excessive

170. Local gas pipeline businesses collectively made $77.4m in regulatory profit in 2021, made up of $34.5m in cash profit and $42.9m in asset revaluations. Figure 67 shows the trend in cash profit after tax and revaluations for all local gas pipeline businesses between 2014 and 2021.

Figure 67: Total regulatory profit after tax across all local gas pipeline businesses, 2014-2021



171. Cash profit has decreased by $18m since 2014 with a distinct step down in 2018. Asset revaluations have increased by $31.5m since 2014, with a large shift upward in 2021.

172. Cash profits have been decreasing due to reductions in interest rates which remained low until after the end of the 2021 period. The low interest rate meant that the cost of capital to invest reduced. We reflected this in a change to the return we allowed the local gas pipeline businesses to earn on their investments for a five-year period starting in 2018. This meant that cash profit from 2018 did not need to be as high to ensure that local gas pipeline businesses were fairly compensated for their investments, which resulted in a decrease in profit of 5.6% per year or 33% since 2014.

173. The non-cash gains from asset revaluations are driven by changes in the underlying RAB, and changes in inflation, which does not have an immediate impact on customers' bills. While the RAB has been growing steadily over time, Figure 10 showed that inflation was comparatively low in 2015 and 2016. In all other years, particularly in 2021, inflation was comparatively high, which is consistent with larger asset revaluation gains.

Local gas pipeline businesses have generally not made excessive profits over the last eight years

174. Total profit as a proportion of the value of assets is a measure of profitability known as the return on investment. This can be compared to a company's required rate of return, which is the level of return demanded across its investors and creditors. A company's required rate of return is also known as its cost to invest, or WACC.

175. In determining the WACC for local gas pipeline businesses, we include an assessment of the typical premium that a business with a similar risk profile would earn in a market setting (above the rate of return on comparatively low-risk investments). Hence, it is possible to

assess whether the local gas pipeline businesses are making excessive profit (ie, profit beyond what they would be expected to earn).

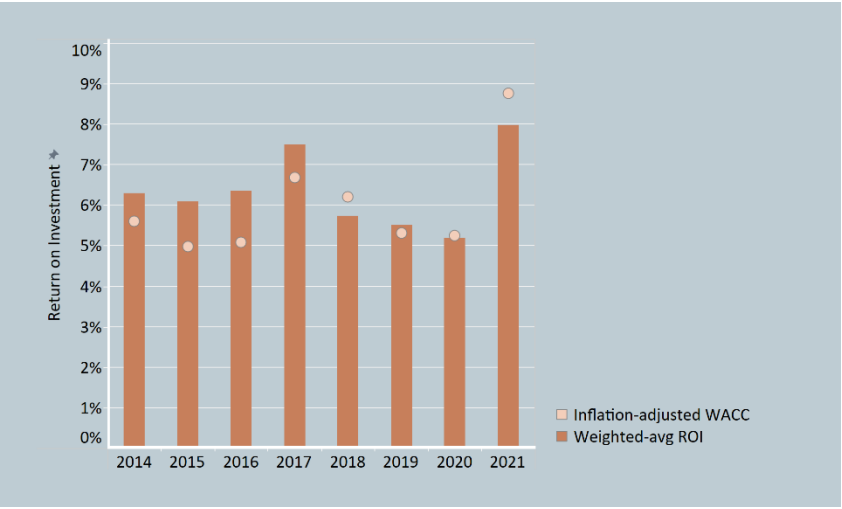
176. Figure 68 shows:

176.1 the return on investment: total regulatory profit after tax expressed as a percentage of the total value of assets across all local gas pipeline businesses between 2014 and 2021, and

176.2 the required rate of return we estimated at the time of setting each DPP, after tax and adjusted for the difference between forecast inflation (incorporated as an input into modelling) and ex-post inflation.

177. Comparing the rate of return on investment to an adjusted WACC is intended to represent a comparison in real terms. Comparing the return on investment and estimated WACC in real terms is consistent with us setting price-quality paths by applying the principle of ex ante real financial capital maintenance.[36]

Figure 68: Return on investment vs post-tax WACC adjusted for ex-post inflation across all local gas pipeline businesses, 2014-2021



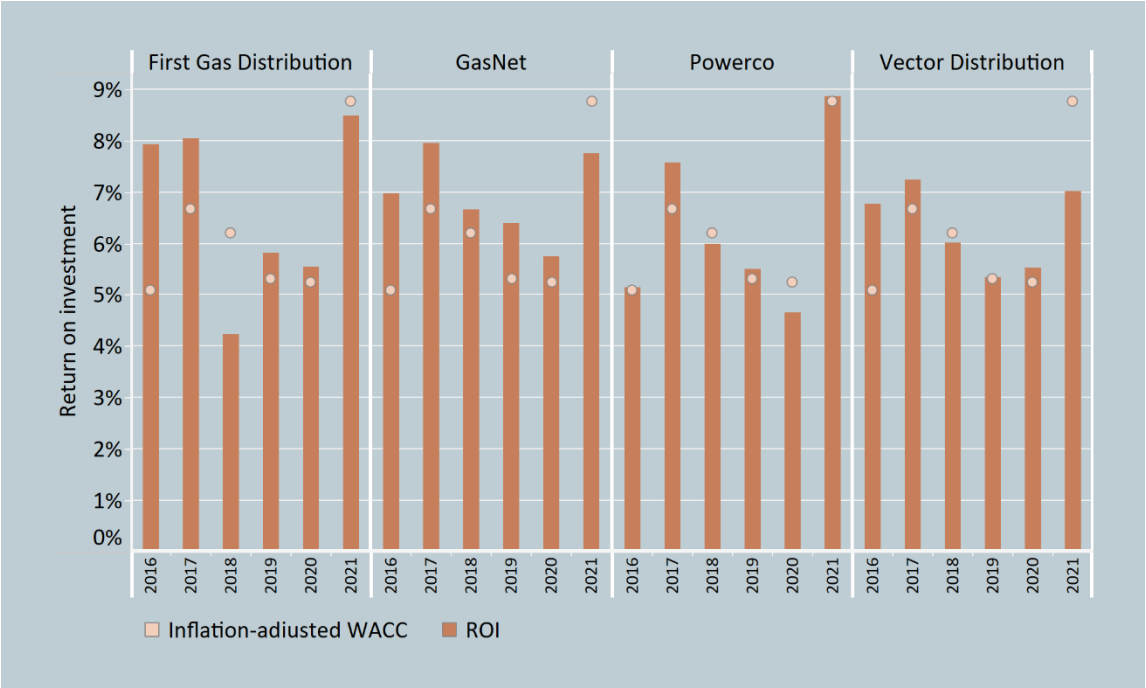
178. At the industry level, the adjusted return on investment has been broadly consistent with the estimated cost to invest. In the first and last years of regulatory periods, return on investment tends to fluctuate more so than in the years between.

179. The return on investment for each local gas pipeline business varies depending on their revenue, operating expenditure, changes to their RAB and inflation (via revaluations). Figure

[36] Under real financial capital maintenance, a regulated supplier can earn profits that compensate for its cost of capital over time (considering its exposure to risk)—ie, to earn a 'normal return'. Allowing a regulated supplier the opportunity (but not guarantee) to earn normal returns over the lifetime of an investment provides it with a chance to maintain the financial capital it has invested, thus maintaining incentives to invest.

69 shows the return on investment, as compared to the estimated required rate of return adjusted for ex-post inflation for each local gas pipeline business between 2016 and 2021.

Figure 69: Return on investment vs post-tax WACC adjusted for ex-post inflation for each local gas pipeline business, 2016-2021



180. The return on investment for each local gas pipeline business has generally been in line with the ex-post estimate of their cost to invest in recent years. First Gas' return on investment is high in 2016 due to reduced capex during the acquisition of Vector pipelines, and high in 2017 due to an extended disclosure period of 15 months which includes two winters and thus slightly increased line charge revenues. First Gas' return on investment was low in 2018 due to an increase in business support opex, as mentioned in paragraph 137. In 2021, higher inflation drove the increase in adjusted WACC compared to returns in prior years.

181. Our estimate of the WACC that we used to set price-quality paths for the local gas pipeline businesses was 6.77% after tax for the 2013 to 2017 disclosure years and 5.85% after tax for the 2018 to 2022 disclosure years. Ex-post inflation was lower for every quarter than the forecast inflation used in setting the 2013-2017 DPP, resulting in adjusted WACC figures between 4.97% and 6.67%. Ex-post inflation had been generally higher prior to March 2020 than the inflation used in setting the 2017-2022 DPP, resulting in adjusted WACC figures between 5.25% and 8.76%. Overall, returns across industry and for each local gas pipeline business were generally in line with the estimates of WACC adjusted for ex-post inflation, suggesting that local gas pipeline businesses have generally not made excessive returns over the last eight years.

Chapter 3 – Performance of gas transmission businesses

Purpose of this chapter

182. The purpose of this chapter is to provide an overview of gas transmission businesses and the results of our analysis of their performance, including trends in businesses' revenue and costs and the quality of the regulated services that they provide. The aim is to provide insight into issues that have affected gas transmission businesses in recent years, and the underlying drivers of the trends or anomalies observed where possible.

183. Trends are examined from an industry view, as the gas transmission assets of Vector's gas transmission business and MDL were purchased in mid-2016, with only one gas transmission business (First Gas) existing since then. More detail on the gas transmission asset transaction is provided in the 'overview' section below and within the Approach paper.

184. Except where we refer to single-year figures, or state that a figure is an absolute increase in dollars or dollars-per-customer, our analysis refers to the growth implied by the trend – for the reasons explained in the Approach paper regarding our use of trend analysis.

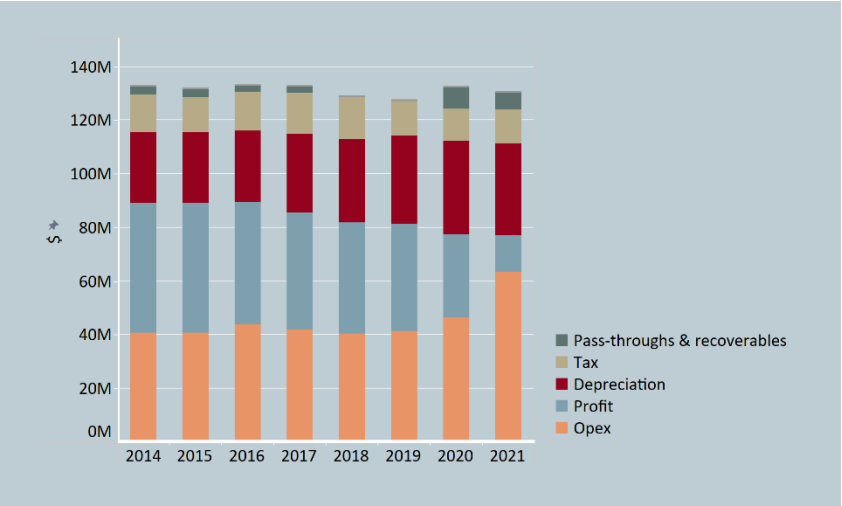
185. Further, the charts and figures for monetary data are given in nominal terms unless otherwise stated, ie, they have not been adjusted to exclude the impact of inflation.

Key findings

186. Gas transmission businesses' regulated revenue has remained relatively stable at around $131m in 2021, decreasing by $1.9m in nominal terms since 2014. After accounting for general price inflation, gas transmission revenues have fallen by $16.3m since 2014. The volume of gas delivered via transmission pipelines has also decreased since 2014.

187. Figure 70 shows the breakdown of what revenue has recovered between 2014 and 2021.

Figure 70: Breakdown of gas transmission business revenue, 2014-2021



188. During the 2021 year, the decision was made to discontinue the Gas Transmission Access Code (GTAC) project. GTAC was initially implemented to combine the support of a new gas transmission access code applicable to both pipelines, used for managing commercial operations across both pipeline systems.

189. The GTAC project began in 2016 in a context of relatively plentiful gas supply and high gas demand. During 2021, the project was discontinued due to challenges experienced with the project and changes in the external environment facing the gas sector. To account for this discontinuation of the project, a negative capex adjustment was made of $12.8m, with the historical project amounts written off to business support opex. The one-off adjustment resulted in increased business support opex, and decreased capex, flows onto the reduction in the cash profit for the year as well as a reduced ROI, compared to if the adjustment was not made.

190. Opex and depreciation comprise the largest components of gas transmission revenues in 2021, at 48% and 26% respectively. Opex has increased by $23m in nominal terms, or 7% per year on average since 2014, with the large increase in 2021 primarily due to the GTAC project discontinuation. Depreciation has increased by $8m in nominal terms or 4% on average between 2014 and 2021.

191. Between 2014 and 2021 cash profit earned by gas transmission businesses decreased from $48.3m to $13.7m, or $4.9m or 16% per year on average. Since 2014, revaluation of assets (non-cash profit) increased from $10.3m to $41.7m, or $5.2m or 22% per year on average. The rate of return of gas transmission businesses is either in line with, or below our estimates of a reasonable rate of return adjusted for ex-post inflation, suggesting that they have generally not made excessive profits over the last eight years.

192. In 2021, gas transmission businesses' capex was $7m or 29% lower than in 2014, with most of the investment being on network assets. Growth in network and non-network assets has led to depreciation increasing by $7.9m since 2014. The regulated asset base of First Gas

(upon which their total return on assets is based) was valued at $874.5m in 2021, an increase of $82m (10%) since 2014.

193. Investment in gas transmission pipelines has been focussed on maintaining network assets, followed by 'office and support' capex. The 'maintaining assets' category of capex has increased by $12m in nominal terms since 2014.

194. Expenditure to support growth and other ancillary investments on gas transmission pipelines relate to large customer or third-party requirements and have been sporadic over the last eight years. As a result, capital contributions from customers and third parties have also varied over time.

195. The cost of operating gas transmission businesses has averaged $45m per year between 2014 and 2021 and has increased by $21.5m since 2014, to $62m. The reason for the large increase in the 2021 year is an increase in business support opex, driven by the discontinuation of the GTAC project in 2021. Non-network opex costs made up 55% of opex between 2014 and 2021 and has increased by $3.1m per year on average during that time. System operations and network support opex decreased between 2017 and 2021 following First Gas' acquisition of both gas transmission pipeline systems, while business support opex increased as described above.

196. We expect interruptions to gas transmission services to be infrequent and brief, and this was the case between 2014 and 2021. Beyond outage and network integrity measures, we collect metrics on compressor unit availability and utilisation, which may be useful indicators of any issues in the future. Average compressor utilisation across all units has increased markedly since 2018, and the number of failed starts has improved since its 2015 peak. The number of instances of compressors being unavailable when required increased significantly in 2018 with the commissioning of an electrically powered compressor in Henderson (which fail if the electrical supply fails) but has been decreasing overall since then.

197. The remainder of the chapter is structured as below, following an overview of gas transmission businesses:

197.1 regulated revenue

197.2 primary components recovered by revenue

197.3 capital expenditure

197.4 investment breakdown

197.5 operating expenditure

197.6 service reliability

197.7 profit

197.8 return on investment.

Overview of gas transmission

198. The gas transmission business, First Gas, is responsible for transporting natural gas from processing facilities through to directly connected customers or gas delivery points across the North Island. Directly connected customers include petrochemical producers, electricity generators, large greenhouses, and the oil refinery.

199. As First Gas owns the entire gas transmission network, it holds a monopoly in the services that they provide using their gas transmission assets. Prior to 2016, each of these systems were owned by MDL and Vector, as noted in paragraph 8.

199.1 Any reference to "gas transmission businesses" may refer to either MDL and Vector, First Gas Transmission alone, or all three businesses, as noted in paragraph 8. Within this chapter, "First Gas" refers to the First Gas transmission business (ie, not the local gas pipeline business).

199.2 We describe the treatment of the ID data, including the transitionary ID data reported in the periods following the sale, in the Approach paper published alongside this report.

200. Gas transmission network assets fall broadly into five categories:

200.1 high pressure pipes, to transport gas from producers to local gas pipeline networks and large users;

200.2 main line valves, to isolate the flow of gas in an emergency;

200.3 compressors, to increase pressure and improve gas flow over longer distances to the ends of the system;

200.4 stations for intake, offtake, metering systems and pressure inspection; and

200.5 other station components:

200.5.1 heating systems (to prevent operating issues arising from the temperature decreases that are associated with pressure reduction for local gas pipeline networks);

200.5.2 odorisation plants (for leak detection);

200.5.3 coalescers (to filter out solids and liquids);

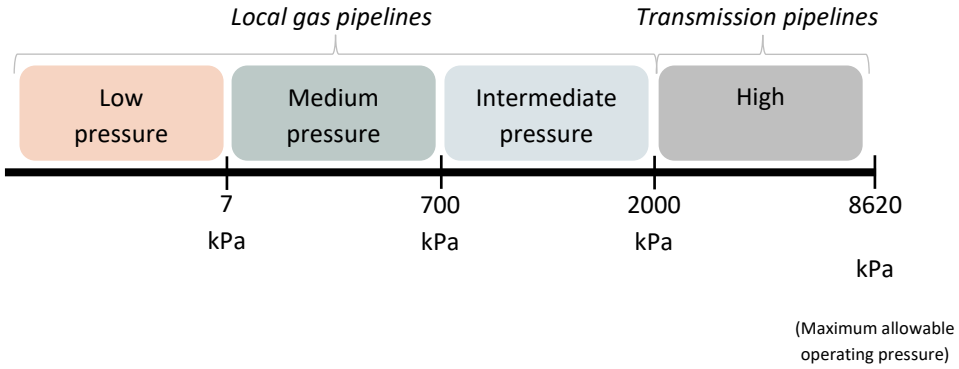
200.5.4 communications (ie, SCADA systems);

200.5.5 corrosion protection (ie, cathodic protection systems); and

200.5.6 gas chromatographs (to detect and analyse chemical composition).

201. Gas transmission pipelines transport gas at pressures between 2000 kPa and 8620 kPa (the latter being the maximum allowable operating pressure of most of First Gas' pipelines). Figure 71 shows a diagram of the ranges of pressures applicable to different classes of pipes.

Figure 71: Pipe pressure classifications for local gas pipelines and transmission pipelines



202. The length of the gas transmission pipeline system as at the end of the 2021 disclosure period was 2514 km. Table 5 shows the length of gas transmission pipelines in each region and the volume of gas conveyed through them in the 2020 disclosure period.

Table 5: Length and gas conveyed through each region's transmission pipelines in 2021 (most recent disclosure period)

Transmission pipeline region	System length at year end (km)	Total gas conveyed during the year (TJ)
South - Kapuni - Frankley Road	1,035	32,482
Bay of Plenty	607	9,489
North	539	27,398
Te Awamutu North	11	416
Minor	16	288
Maui Pipeline	307	124,568
Whole network	2,514	194,641

Gas transmission businesses are subject to a revenue cap with a wash-up mechanism under their DPP

203. Every five years we review the DPP that applies to gas transmission businesses. The previous reset was in May 2017 and applies from 1 October 2017 to 30 September 2022. The next reset, applicable from 1 October 2022, was reset in May 2022.

204. The starting price for the gas transmission businesses is specified in terms of an initial MAR value. This is net of pass-through costs and recoverable costs. The MAR reflects several elements, including:

    204.1 an appropriate return on the regulated assets of the gas transmission business, represented by our estimate of the WACC,

    204.2 our forecast of how the RAB will change (through the commissioning of new assets and depreciation) and

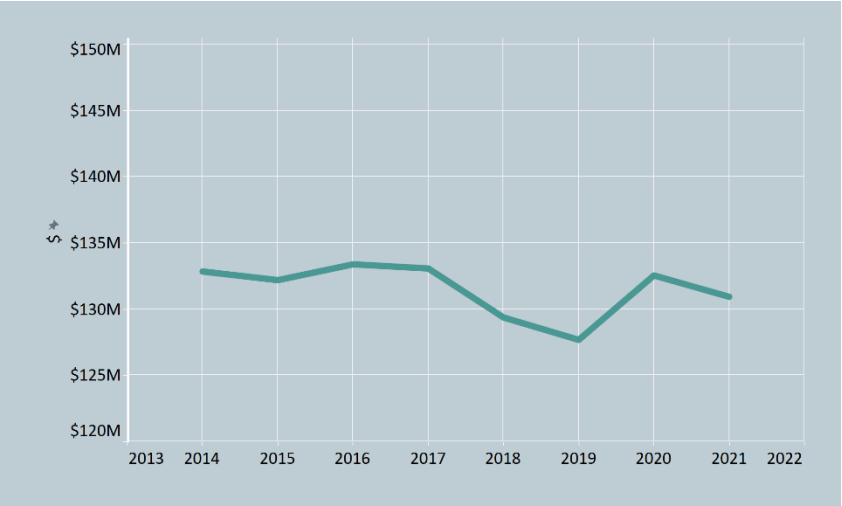
    204.3 our forecast of the opex of the gas transmission business during the regulatory period.

205. In contrast to local gas pipeline businesses, the gas transmission business is thus subject to a revenue cap, with a wash-up mechanism for over- or under-recovery of revenue between years. The forecast allowable revenue of the gas transmission business is set at the start of the regulatory period and does not change depending on the number of customers served through the regulatory period. There may be differences between the actual allowable revenue achieved versus the forecast allowable revenue, depending on how the gas transmission business sets prices each year and the actual quantities that are delivered.

Gas transmission businesses' regulated revenue has remained roughly the same for the past eight years

206. As with local gas pipeline businesses, gas transmission businesses recover the cost of providing regulated gas transmission network services by collecting revenue from the gas customers (passed through via a retail bill). The prices that they are allowed to charge is determined by PQ regulation, which was reset at the same time as the PQ regulation for local gas pipeline businesses in May 2017 and applied from 1 October 2017. The most recent DPP, set in May 2022, applies from 1 October 2022. Figure 72 shows the total revenue collected by gas transmission businesses from 2014 to 2021.

Figure 72: Gas transmission businesses' total revenue, 2014-2021



207. Gas transmission businesses' revenue has remained relatively stable at around $132m since 2014, decreasing by $1.9m in nominal terms. Revenue dropped slightly in 2018 and 2019 by approximately $5m, before rising again in 2020 and then decreasing again by approximately $2m in 2021.

After accounting for general price inflation, gas transmission business revenues have fallen by $16m since 2014

208. The revenue above reflects the general price pressures impacting the wider economy. Figures 73 and 74 show the change in CPI between 2014 and 2021, and the change in revenue adjusted for inflation (ie, in real terms) since 2014.

Figure 73: Annual rate of inflation, years ending September, 2014-2021

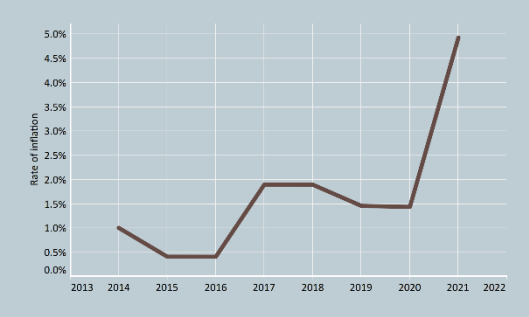
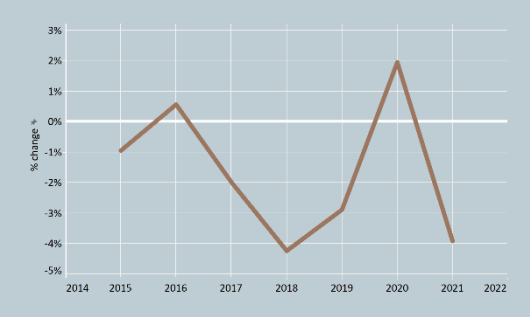


Figure 74: Annual rate of change in total gas transmission business revenue, adjusted for inflation (ie, in real terms), 2015-2021



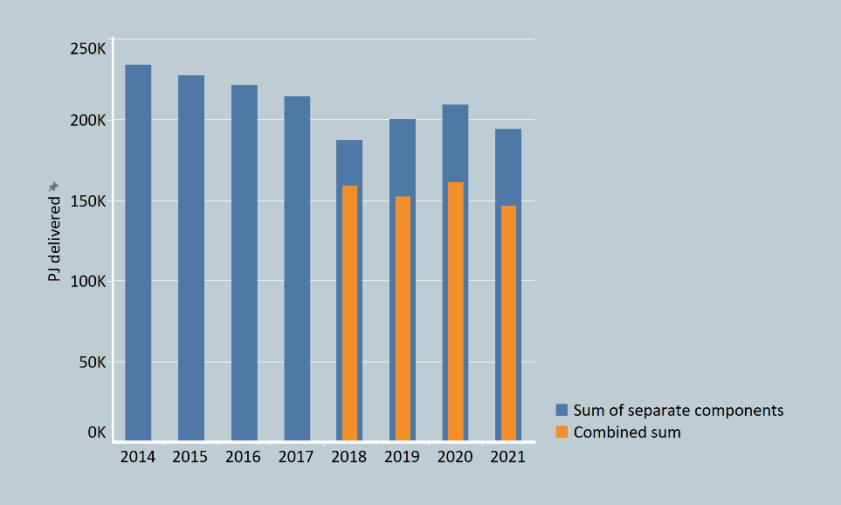
209. CPI has increased steadily by approximately 1.8% per year on average (and 13% in total) since 2014. Using CPI to adjust for inflation, revenues have fallen by $19m in real terms, or 14% between 2014 and 2021. The rate of change in revenue in real terms has fluctuated over this time, spiking in 2020 after decreasing year-on-year between 2017 and 2019.

The volume of gas delivered via transmission pipelines has decreased since 2014

210. The volume of gas delivered via gas transmission pipelines is far higher than the volume carried through local gas pipeline networks. Most of the gas consumed in New Zealand is by large industrial users directly connected to gas transmission pipeline systems. Compared to local gas pipeline businesses, growth in the number of customers connected directly to transmission pipelines is a less relevant driver of their growth and investment activities, so customer numbers are not used to represent growth in this chapter.

211. Figure 75 shows the gas delivered via gas transmission pipelines between 2014 and 2021.

Figure 75: Total energy delivered through gas transmission pipelines, 2014-2021



212. Figure 75 includes two data series:

212.1 the longer running series is the summation of gas volumes delivered across *two* sets of reported pipeline data; and

212.2 the shorter series, beginning in 2018, is of volumes delivered across all pipeline systems, reported as a single value by First Gas in its information disclosures.

213. As gas delivered may be transported via both these interconnected pipeline systems, as described in paragraph 7, there is potentially double-counting of volumes across pipelines in the longer-running data series. The newer series is a more reliable measure as it accounts for the potential double-counting.

214. The long-running data series indicates a drop in volumes delivered between 2017 and 2018. This is consistent with the beginnings of unanticipated decreasing rates of gas extraction at the Pohokura offshore gas field in 2018. This issue persisted through 2019 to 2021, as volumes continued to decline in 2021.[37]

Gas transmission businesses' revenue recovers five primary components, with opex and depreciation comprising 48% and 26% respectively in 2021

215. Gas transmission businesses' revenue allows recovery of five high-level components:

215.1 opex costs, which are borne by the gas transmission business and relate to the services that it provides using its assets;

[37] Ministry of Business, Innovation and Employment data tables for gas, https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/gas-statistics/ (viewed on 7 December 2022)

215.2 depreciation, which represents the recovery of capital invested in the gas transmission business over the asset's life;

215.3 a component that they retain as cash profit. Cash profit is defined within this report as the total regulatory profit after tax, excluding revaluations;

215.4 tax, which is primarily driven by profit; and

215.5 pass-through costs, which are the costs of services provided by other parties (eg, rates, Commerce Act and industry levies) or recoverable costs, which the gas transmission business is permitted to recoup (eg, balancing gas and Mokau compressor fuel costs).

215.6 These costs are bundled into network charges and First Gas either passes on the funds it receives from customers (via retailers) to the parties that it provides the service to, or uses the funds to recoup specific costs, without any mark-up.[38]

216. Figures 76 and 77 show the breakdown of revenue, and the change in these five components and these trends in nominal terms between 2014 and 2021.

Figure 76: Breakdown of gas transmission business revenue, 2014-2021

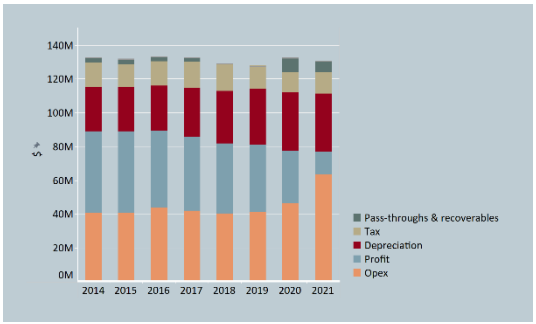
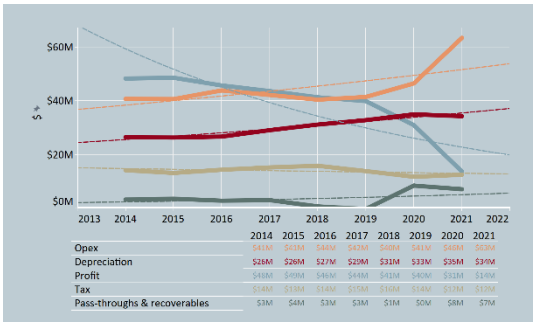


Figure 77: Trends in gas transmission business revenue components, 2014-2021



217. Gas transmission businesses' opex formed 48% of revenue in 2021, and an average of 34% of revenue between 2014 and 2021. Opex has increased from $41m in 2014 to $63m in 2021 in nominal terms, or 6% per year on average since 2014. Increases have not been consistent over time; opex dipped briefly to 2014-15 levels at the start of the new regulatory period in 2018 before rising again. The larger increase in opex in 2021 is primarily due to the writing

[38] Pass-through costs are outside of the gas transmission business' control, and recoverable costs are largely outside of its control, which is why First Gas is allowed to pass through or recover them, rather than the costs being included under its revenue cap.

off of the GTAC project, which had previously been recorded as capex. This was a one-off adjustment to account for discontinuation of the project in 2021.

218. While depreciation is a smaller component of gas transmission businesses' revenue at 26% in 2021 and 23% of total revenue between 2014 and 2021, it has increased consistently by $7.9m in total, or 4% per year on average, between 2014 and 2021.

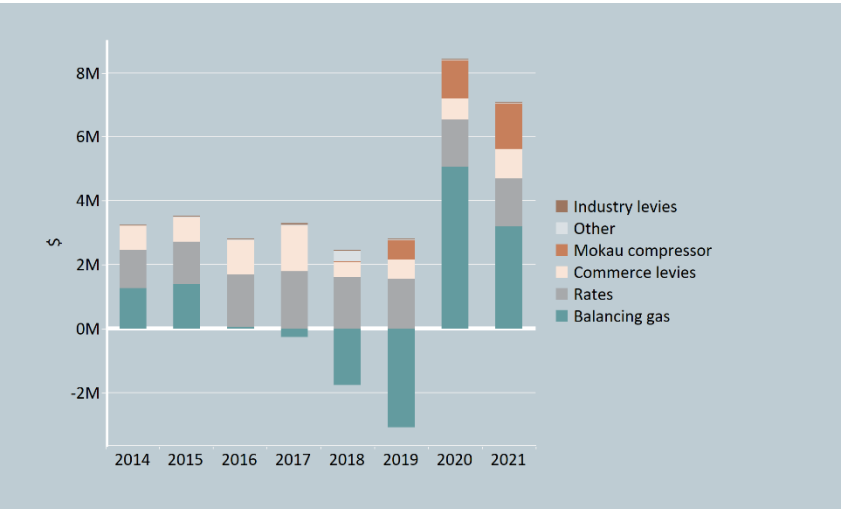
219. The WACC we estimate when we set the price-quality path for gas transmission businesses determines our expectation of profit for the gas transmission business at the time we set the DPP (through the allowed rate of return on their regulated assets, described in paragraph 205).

220. The cash profit component has reduced from $48m by $4.9m or 16% per year on average between 2014 and 2021. In comparison, the revaluation of assets (non-cash profit) shown at the end of this chapter increased from $10m in 2014 to $42m in 2021, or 22% per year on average. Profit and return on investment are described in further detail at the end of this chapter.

221. Tax has decreased slightly by $0.2m per year on average since 2014, following the downward trend in cash profits.

222. Pass-through and recoverable costs are a small component of revenues and were fairly stable in nominal terms between 2014 and 2017 but have been more volatile between 2018 and 2021. Figure 78 shows the breakdown of pass-through and recoverable costs for gas transmission between 2014 and 2021.

Figure 78: Breakdown of gas transmission businesses' pass-through and recoverable costs, 2014-2021



223. Rates costs are a consistently large component of pass-through and recoverable costs, averaging $1.5m per year between 2014 and 2021. In recent years, the cost of balancing gas has increased in volatility, which has been driving movement in the overall pass-through and recoverable cost component of revenue.

224. Balancing gas is purchased or sold on the gas spot market by the gas transmission business to ensure pipeline linepack (a measure of pressure) remains within lower and upper limits for safe operation. Pohokura production decline since 2018 has led to tight supply in the spot gas market, which has driven up spot prices. In 2018 and 2019, First Gas experienced negative costs from selling more balancing gas at high prices than its purchases, but in 2020 and 2021 the cost of its balancing gas purchases at high gas spot prices outweighed any balancing gas sales.

In 2021, gas transmission businesses' capex was $16.6m, 29% lower than in 2014, due to a one-off capex adjustment.

225. Both capex and opex for gas transmission have been increasing over time, as shown in Figure 79.

226. Non-network capex was unusual in 2021, due to the discontinuation of the GTAC programme. As a result of this program being discontinued, expenditure of $12.8m was reclassified to opex. Had this reclassification of expenditure not occurred, capex in 2021 would have been 26% greater than it was in 2014.

Figure 79: Total capex vs opex for gas transmission businesses, 2014-2021

227. Unlike local gas pipeline businesses, total gas transmission opex generally exceeds capex, but as major capex relates to specific projects it also tends to be peaky. Capex is shown here including the value of capital contributions, ie, the figures show expenditure made by the gas transmission business that was, in part, recovered directly from the customers or third parties requesting connection or relocation. Capital contributions are discussed in further detail later in this chapter.

228. 2021 shows a decrease in capex primarily due to the discontinuation of the GTAC project. As the GTAC project is no longer capitalised, the costs were required to be expensed as opex, resulting in an overall increase in opex and a decrease in capex for 2021, in contrast to the prior year.

229. For the seven years between 2014 and 2020, capex has also been growing as a proportion of total expenditure at an average of 5% per year since 2014. However, when including the 2021 year in the trend, capex, as a proportion of total expenditure, decreases by 8%, due to the negative capex adjustment for the GTAC project.

230. Gas transmission businesses invest in assets to support the health of the network. Capex is reported across a range of categories, which fall under four broad descriptions. These categories, sub-categories and the purpose of the capex are described in Table 6.

231. Gas transmission businesses' capex can be split into costs associated with network and non-network assets:

    231.1 *Network assets* are directly involved in transporting gas through the high-pressure transmission network to offtake points for local gas pipeline systems or end users, eg, pipelines, line valves, protection, and control systems.

    231.2 *Non-network assets* support gas transmission services but are not part of the network itself, eg, vehicles, office equipment.

232. The capex categories in Table 6 that relate to network assets are described as *network* capex, and those relating to non-network assets as *non-network* capex.

Table 6: Mapping of categories and purpose of capex

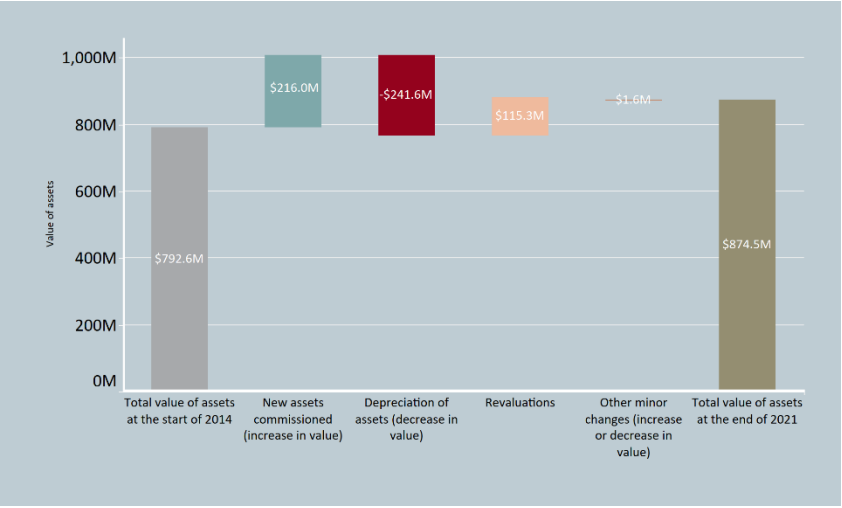
Category used	Capital expenditure category in ID	Capex type	Purpose of capex
Maintaining assets	Asset replacement and renewal	Network	To mitigate deterioration of assets or their surroundings, or address obsolescence of assets
	Reliability, safety and environment	Network	To improve the quality or safety of the network for consumers, to meet regulatory requirements or achieve enhancements related to the environment
Supporting growth	Consumer connections	Network	To establish new connection points for consumers on the network, or alter existing connection points

	System growth	Network	To implement a change in demand on the network assets (and includes expenditure that is not recoverable from the source of the change in demand)
Office and support	Non-network routine	Non-network	On general assets not directly related to the network used in the supply of gas distribution services
	Non-network atypical	Non-network	Special projects not directly related to the network used in the supply of gas distribution services
Other ancillary investment	Network relocation	Network	Expenditure to relocate assets, with service potential not being materially different from the original location
	Financing	Non-network	Costs associated with borrowing for capex projects/programmes

The RAB of First Gas was valued at $875m in 2021, an increase of $82m since 2014

233. Capex contributes to the growth of the gas transmission businesses' RAB once assets are commissioned. Figure 80 shows the drivers of changes the total RAB value for gas transmission between 2014 and 2021.

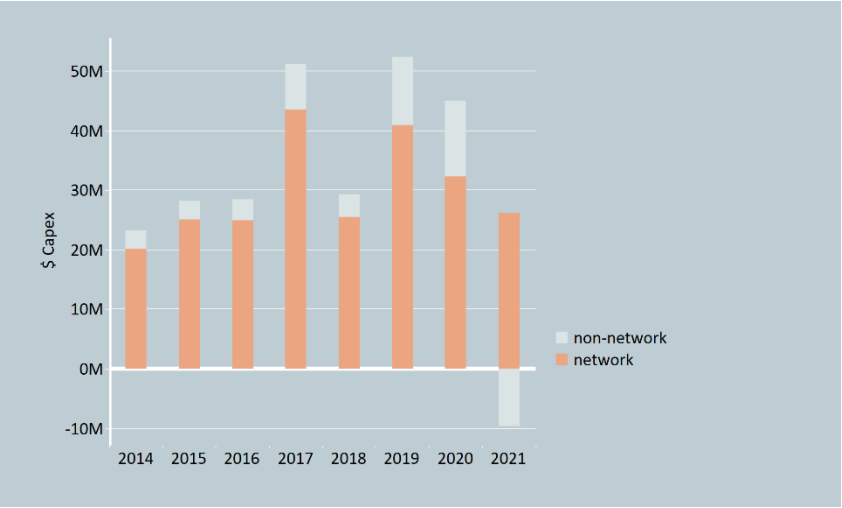
Figure 80: Waterfall of changes in gas transmission RAB, 2014-2021



234. Newly commissioned assets and depreciation are the largest components of change in the RAB since 2014, at $216m increase and $242m decrease respectively. Depreciation has more than offset the increase in the value of the RAB contributed by newly commissioned assets. Revaluation has increased the RAB value by $115m over the same period. In total, First Gas has a RAB valued at $875m in 2021, an increase of $82m or 10% since 2014.

235. The RAB is composed primarily of network assets, indicating that historical capex has been focussed on network investments. Figure 81 shows the split of capex between network and non-network investment for gas transmission, from 2014 to 2021.

Figure 81: Split of gas transmission businesses' network vs non-network capex, 2014-2021



236. Network capex has increased by $6m in nominal terms or 4% each year between 2014 and 2021. The negative non-network capex in 2021 resulted from the GTAC project; the capex of the project was transferred to opex to account for its discontinuation. Year-to-year variation in capex is driven by different network capex programmes.

Growth in network and non-network assets has led to depreciation increasing by $7.9m since 2014

237. Commissioned capex ultimately flows through to the prices consumers pay for the services of the gas transmission business via increases in the value of the RAB (through the commissioning of new assets) and thus depreciation which, along with forecast opex allowances, factors into the setting of the MAR. Figures 82 and 83 show depreciation in total and as a proportion of the RAB, and the split of depreciation between network and non-network assets for gas transmission businesses between 2014 and 2021.

Figure 82: Gas transmission businesses' total depreciation and as a percentage of closing RAB, 2014-2021

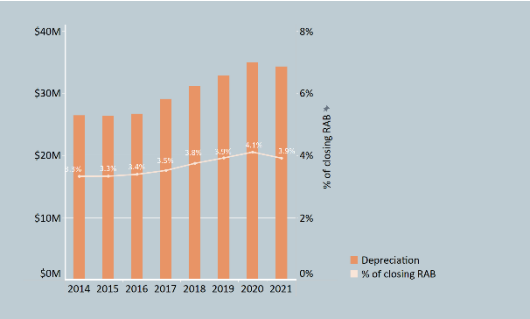
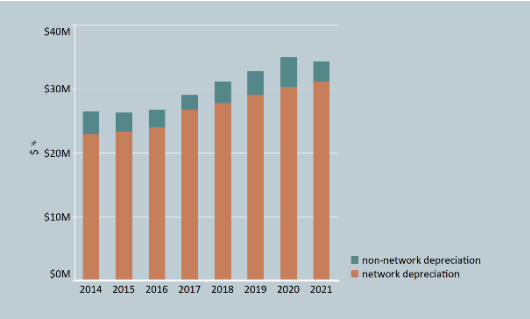
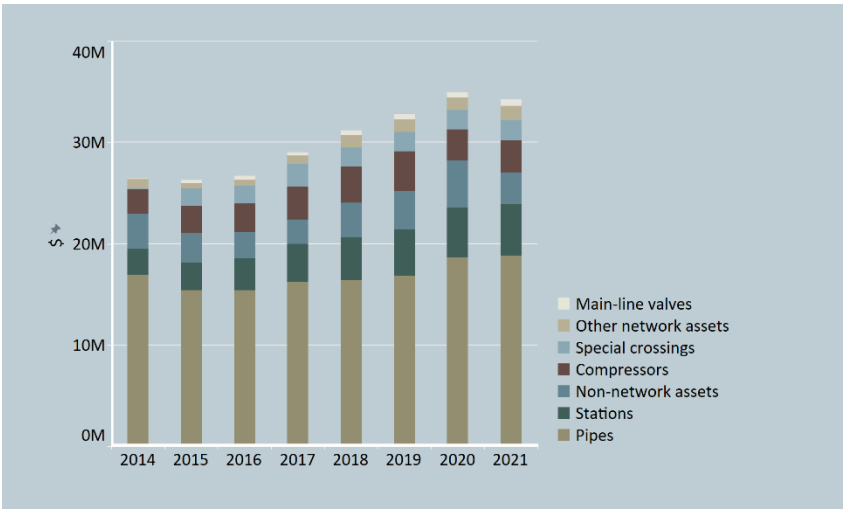


Figure 83: Split of gas transmission businesses' network vs non-network depreciation, 2014-2021



238. Depreciation has been growing since 2014, both in absolute terms (by $7.9m or 30%), and as a proportion of the RAB as the average remaining life of assets is decreasing. Network asset depreciation has increased from $23m by $8.2m or 36% in nominal terms since 2014. Non-network depreciation has decreased by 9% overall, from $3.5m in 2014 to $3.2m in 2021. Figure 84 shows the breakdown of gas transmission businesses' depreciation by asset type between 2014 and 2021.

Figure 84: Breakdown of gas transmission businesses' depreciation by asset type, 2014-2021



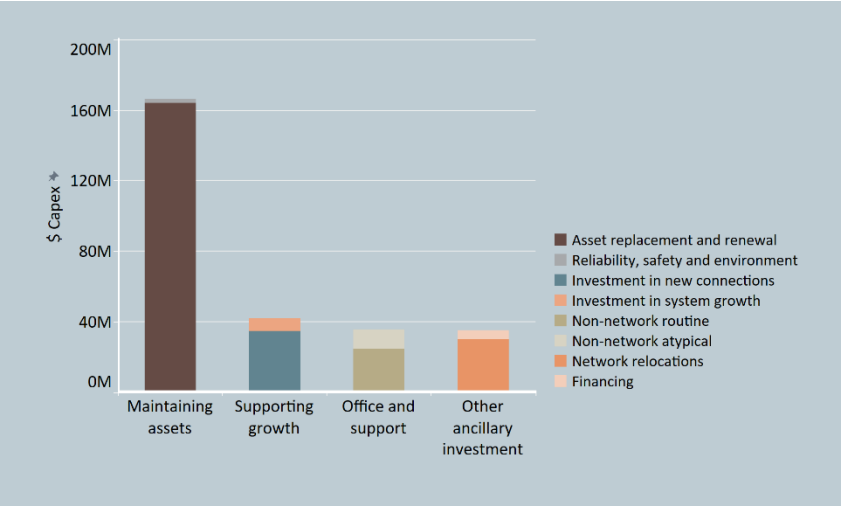
239. The majority of depreciation in network assets relates to pipes, followed by stations and compressors – averaging $17m, $4m and $3m respectively between 2014 and 2021. Depreciation across all types of network assets has been increasing since 2014 but is the

largest in absolute terms for pipes and stations, which have increased by $2m and $2.5m respectively since 2014. Depreciation of pipes increased in 2020 with a smaller increase in 2021.[39]

Gas transmission pipeline investment has been focused on maintaining assets

240. Gas transmission businesses' capex programmes have mainly been focussed on the 'maintaining assets' category. Figure 85 shows the total capex by investment type for gas transmission between 2014 and 2021, while Figure 86 shows the capex by high-level investment category as a time series between 2014 and 2021.

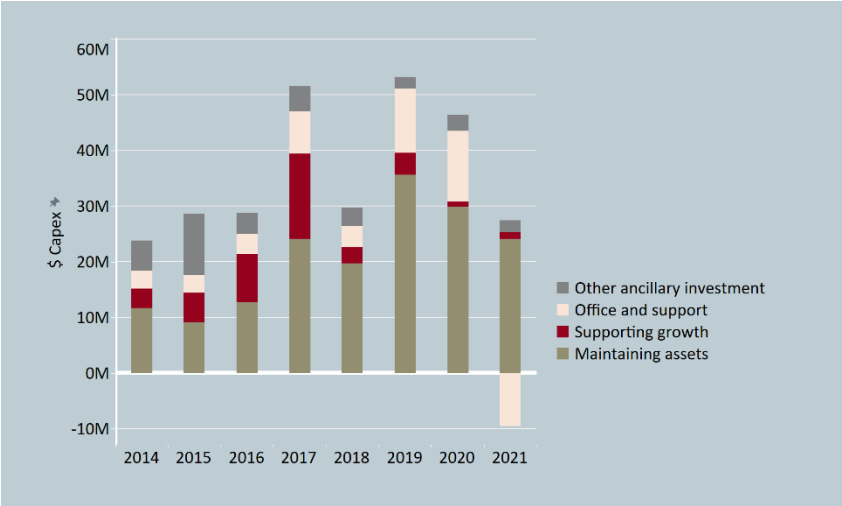
Figure 85: Gas transmission businesses' total capex by investment type between 2014 and 2021



241. Expenditure to maintain assets is made up of 'asset renewal and replacement' expenditure (addressing obsolescence or deterioration of assets), and 'reliability, safety and environment' expenditure (relating to improving the quality or safety of the network). Capex in the 'maintaining assets' category has totalled $167m over the last eight years. 'Supporting growth' is the next largest category of capex, totalling $42m since 2014.

[39] Gas transmission information disclosures in 2014 did not include depreciation data for special crossings separately from other depreciation types.

Figure 86: Gas transmission businesses' capex by high-level investment category, 2014-2021

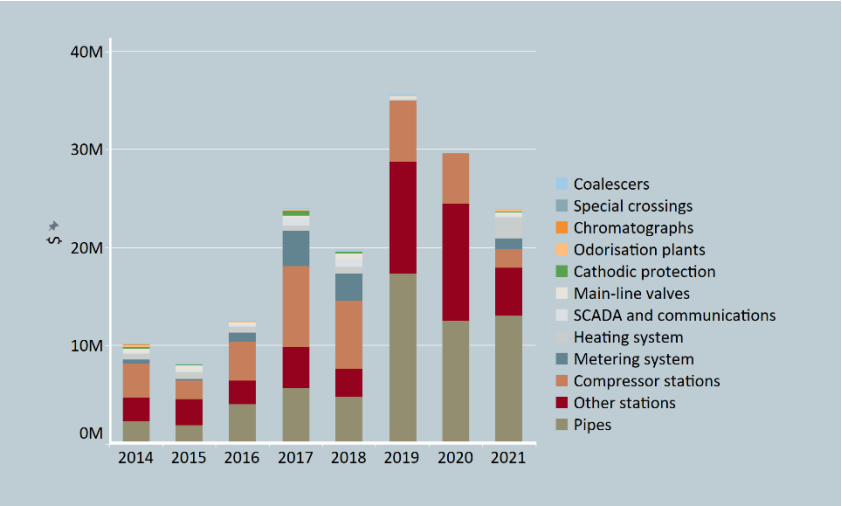


242. 'Maintaining assets' continues to be the largest area of growth in capex, with an increase of $12.4m since 2014. Spend in all other capex categories has decreased by $18.4m since 2014. The 'negative' capex in 2021 for the 'Office and support' category that is visible in Figure 86 is materially due to the discontinuation of the GTAC project, where the historical capex was written off and transferred to opex.

Capital expenditure across asset replacement and renewal and office and support has generally increased since 2014, but varies year to year depending on the projects undertaken

243. Capex across the larger investment types vary year to year, depending on the major projects being undertaken. Figure 87 describes capex for asset replacement and renewal between 2014 and 2021 in more detail.

Figure 87: Breakdown of gas transmission businesses' investment in asset replacement and renewal, 2014-2021

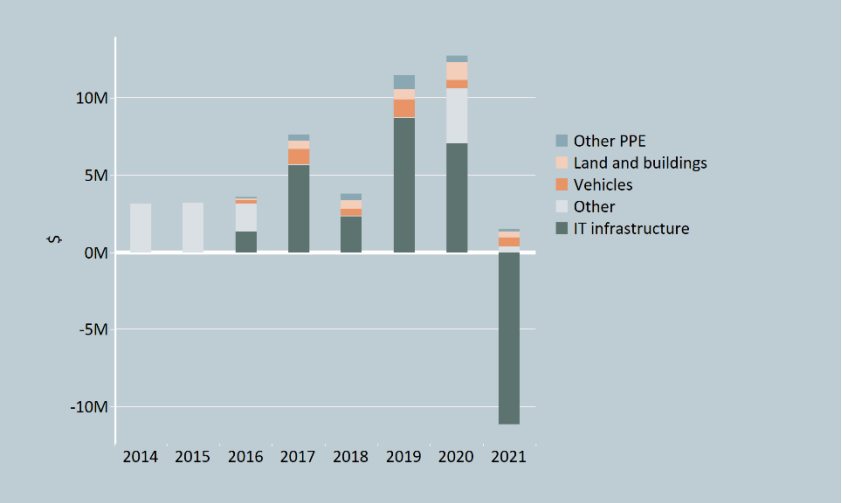


244. Pipes, other stations, and compressor stations typically see the most asset replacement and renewal capex, and capex across these assets has grown by $10.8m, $2.4m and decreased by $1.6m respectively since 2014. Capex on pipes increased significantly in the 2019 to 2021 period as a result of projects for pipeline crease remediation and addressing geohazards.[40] Expenditure on compressor stations has decreased due to a change in First Gas' compression strategy, to focus on fewer compressor sites. [41]

245. Figure 88 shows the capex in the 'office and support' category between 2014 and 2021.

[40] First Gas "Asset Management Plan Update 2019", pages 22 and 30
[41] First Gas "Asset Management Plan Update 2021", page 47

Figure 88: Breakdown of gas transmission businesses' office and support capex, 2014-2021



246. Office and support capex had been low prior to the acquisition of the two transmission systems by First Gas, at roughly $3m per year between 2014 and 2016. However, this has increased markedly, by $9m on average between 2016 and 2020. Prior to 2021, the growth has been driven by IT investment to support a new GTAC applicable to both pipelines, used for managing commercial operations across both pipeline systems. However, the operating and policy environments under which the GTAC started to be developed in 2016 have changed, and changes in the external environment coupled with technical and design challenges led First Gas to permanently discontinue the project in 2021.[42] This resulted in a negative capex for IT infrastructure, reflecting the write-off of the GTAC assets.

247. Also of note is the 'other' component of capex in 2021 of $0.3m, which are capitalised leases (also described as "right of use" assets), due to a change in accounting standard from 2019 onward. The costs associated with these capitalised leases, historically classed as 'business support' opex, were recorded as depreciation of the capitalised leases in 2021 (at $0.3m).

Supporting growth capex and other ancillary investments relate to large customer or third-party requirements, and have been sporadic over the last eight years

248. Capex in the 'supporting growth' and 'other ancillary investment' categories are smaller, but of a similar magnitude to 'office and support'. Figure 89 shows the 'supporting growth' capex for gas transmission between 2014 and 2021, while figure 90 shows 'other ancillary investment' for gas transmission between 2014 and 2021.

[42] First Gas "Gas Transmission Business Asset Management Plan Update – Year commencing 1 October 2021", page 34

Figure 89: Gas transmission businesses' supporting growth capex, 2014-2021

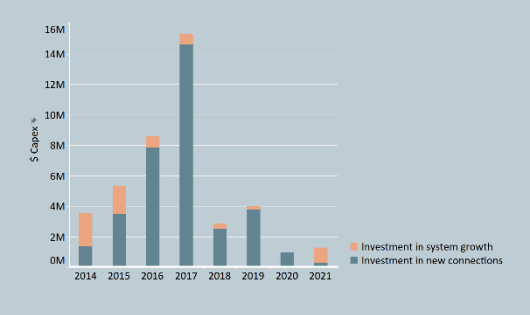
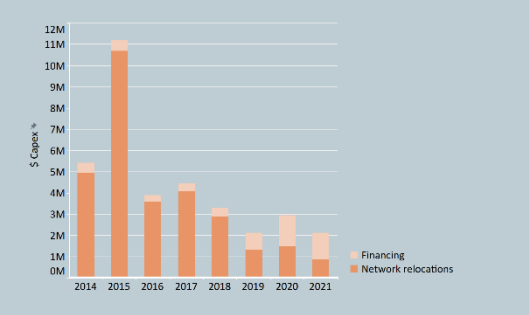


Figure 90: Gas transmission businesses' other ancillary investment, 2014-2021



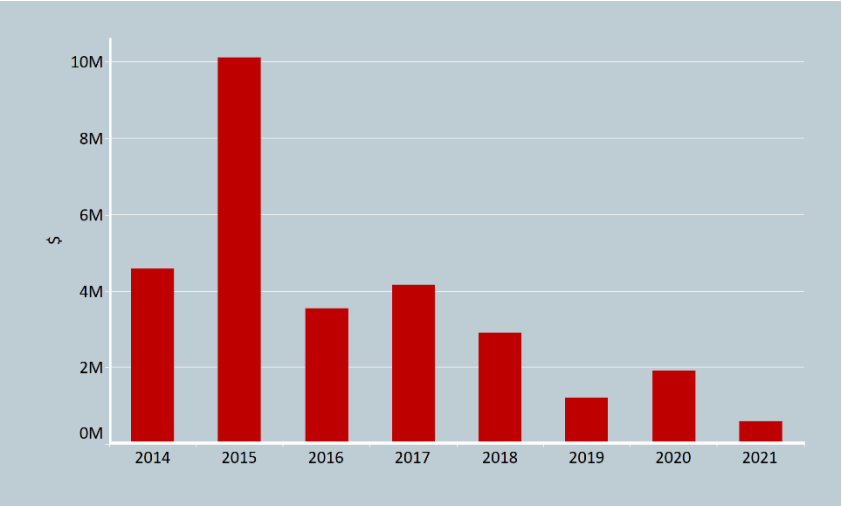
249. The majority of 'supporting growth' projects are associated with new or increased customer connection requirements. The 2017 peak, for example, is from commissioning a new delivery point in Marsden Point and rebuild of a compressor station in Henderson to meet NZ Refining's requirement for greater gas volumes, which cost $10m alone.

250. 'Other ancillary investment' is similarly driven by network relocation capex; the capitalised cost of financing is relatively small. Network relocation in the context of gas transmission is typically prompted by a third-party need – for example, the 2015 spike in network relocation capex is due to the relocation of pipelines and a delivery point in anticipation of state highway construction works. The majority of all network relocation capex between 2014 and 2021 was associated with transport construction projects.

Capital contributions from customers and third parties have varied over time, depending on specific projects and which pipeline system it has been connected to

251. The capital contributions required from customers or third parties by gas transmission businesses are determined by its capital contribution policy. Figures 91 to 93 show the total capital contributions made to gas transmission businesses between 2014 and 2021, and the proportion of new connections and network relocation capex provided for by these capital contributions between 2014 and 2021. Capital contributions in figures 92 and 93 are shown in the narrow red bars, while the wider bars show the total expenditure of the category.

Figure 91: Capital contributions to gas transmission businesses, 2014-2021



252. Capital contributions have been decreasing since 2018, but in general are irregular. The large increase in 2015 was associated with the relocation of pipelines and a delivery point in Waikanae to allow the construction of the Mackays to Peka Peka expressway in Wellington, the cost of which was fully recovered from Waka Kotahi, the New Zealand Transport Agency.

Figure 92: Proportion of gas transmission businesses' new connection capex funded by capital contributions, 2014-2021

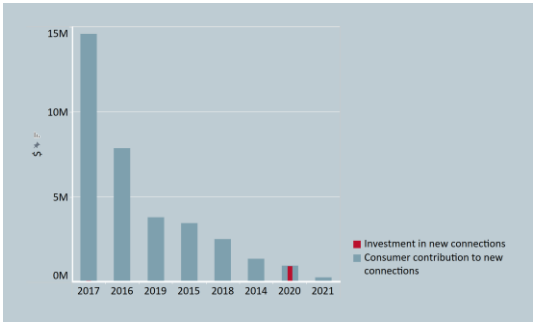
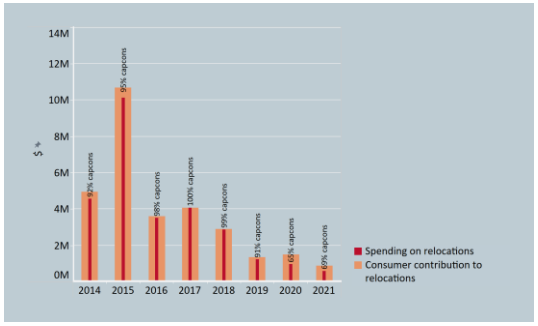


Figure 93: Proportion of gas transmission businesses' network relocation capex funded by capital contributions, 2014-2021



253. Historically, different capital contribution policies existed for each of the high-pressure transmission pipeline systems – one for the former Vector network, and one for the Maui pipeline. Vector's policy was to charge the full or proportionate cost of investment in new assets to the consumer, while MDL did not seek or require capital contributions. In 2020, a new connection was made on the Vector network, and the cost of this was recovered via capital contribution. The two capital contribution policies were effective until July 2020, when First Gas replaced both with a single policy.

254. In contrast, the cost of network relocations is almost fully recouped from third parties. Capital contributions make up more than 90% of the cost of network relocations in most years. As previously noted, the majority of network relocations are due to transport construction projects, while the remainder are associated with residential or commercial developments. In 2020 and 2021 there has been a reduction in the proportion of capital contributions to network relocations.

The cost of operating gas transmission businesses has averaged $45m per year between 2014 and 2021. Opex has increased 25% between 2020 and 2021, due to the discontinuation of the GTAC project

255. Around 34% of gas transmission businesses' revenue between 2014 and 2021, averaging $45m per year, was used to operate their networks and business on a day-to-day basis. In 2021, gas transmission businesses' opex was $22m higher than in 2014, at $62m. This increase has mainly been driven by the reclassification of expenditure from the GTAC project.

256. The GTAC project aimed to create a single access code for the transmission system, which sought to replace the two existing commercial codes, the Maui Pipeline Operating Code, and the Vector Transmission Code. Upon further review, a decision was made not to proceed with this project, and expenditure that had previously been classified as capital expenditure was reclassified to operating expenditure.

257. Gas transmission businesses' opex has occurred over a range of categories. Table 7 describes the different opex categories and the broad purpose of the expenditure that falls within it.

Table 7: Mapping of categories and purpose of opex

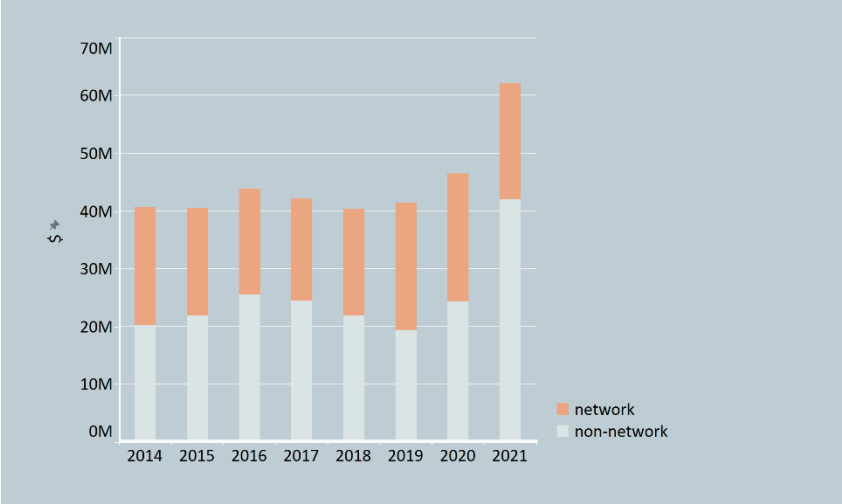
Operational expenditure category in ID (ie, sub-category)	Opex type	Purpose of opex
Asset replacement and renewal (ARR)	Network	To replace, refurbish or renew items that are asset components to ensure quality of supply
Service interruptions, incidents and emergencies (interruptions)	Network	Remedial work responding to an unplanned instantaneous event that impairs the normal operation of network assets
Routine and corrective maintenance and inspection (routine maintenance)	Network	Planned work to rectify faults (beyond initial fault response), routine inspections and testing
Land management	Network	Activities associated with managing and maintaining the land of the pipeline route, eg, erosion management, easement monitoring, communications with landowners
Compressor fuel	Network	Opex relating to consumption of natural gas by the compressor fleet[43]
System operations and network support (SONS)	Non-network	Managing and operating the network, eg, control centre and network planning activities
Business support	Non-network	Administration or opex that is not directly incurred in the physical operation and maintenance of the network, eg, corporate activities
Term credit spread differential (TCSD) allowance	Other	An allowance to cover the notional additional costs of raising long term debt (to the extent the firm has issued such debt).

Non-network opex accounted for 55% of gas transmission business operating costs between 2014 and 2021

258. The gas transmission operating costs of non-network activities have generally been slightly larger than the operating costs associated with network activities during the period between 2014 and 2020. There was a larger increase in the split between non-network and network costs in 2021 primarily due to the discontinuation of the GTAC project and the accounting reclassification of SaaS to opex from non-network capex. Figure 94 shows the split of gas transmission businesses' network and non-network opex between 2014 and 2021.

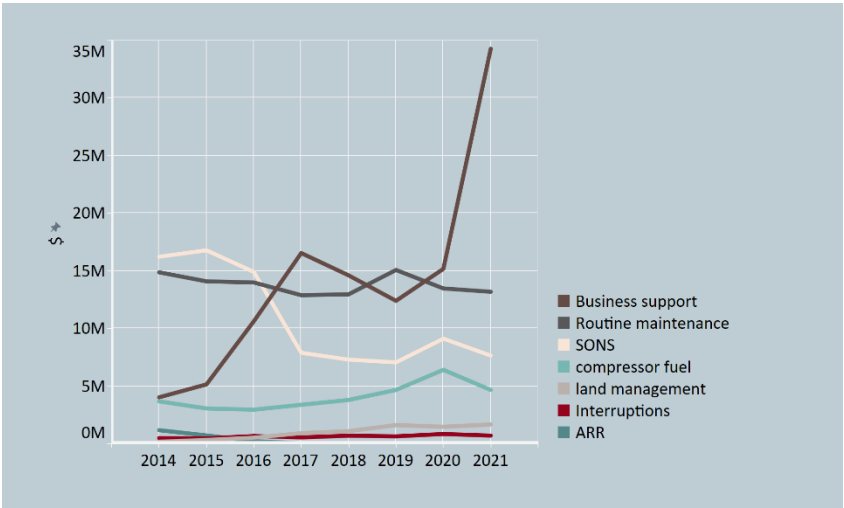
[43] As of the regulatory period beginning 1 October 2017, First Gas has been able to treat compressor fuel costs associated with the Mokau compressor only as a recoverable cost, due to it often acting as a substitute to balancing gas activities on the Maui pipeline (the cost of which is recoverable, and had been recoverable prior to 1 October 2017). This will continue into the new regulatory period beginning 1 October 2022.

Figure 94: Split of gas transmission businesses' network vs non-network opex, 2014-2021



259. Non-network opex accounted for 55% of total opex between 2014 and 2021 and has been increasing by 11% per year on average, with the largest increase occurring from the 2020 to 2021 year. Network opex averaged $19.7m from 2014 to 2021 with small fluctuations year-on-year. Figure 95 shows the breakdown of gas transmission businesses' opex by expenditure category between 2014 and 2021.

Figure 95: Gas transmission businesses' opex by expenditure category, 2014-2021



260. Over 2014 – 2020, routine maintenance was consistently the largest component of operating expenditure by gas transmission businesses since 2014, totalling $98m.

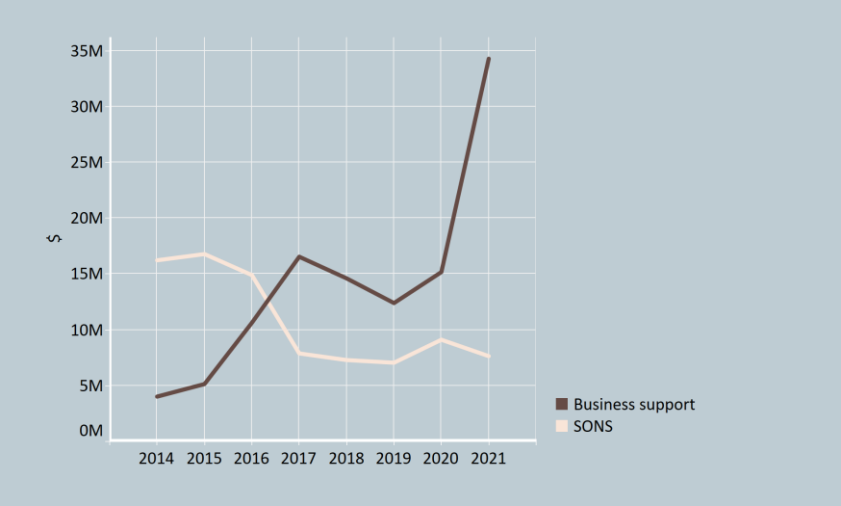
261. In 2021, however, business support opex sharply overtook the routine maintenance as the largest category, due to the writing off of the GTAC project assets after its Board's decision to discontinue the project in 2021. Further business support opex costs out of the expected pattern of expenditure included the accounting reclassification of SaaS from capex to opex.

262. ‘System operations and network support’ expenditure was the largest between 2014 and 2016, but decreased in 2017 through First Gas’ recategorisation of network support costs as ‘business support’ opex following its acquisition of both transmission pipeline systems. ‘Business support’ opex has increased since 2016 and by 2021 had exceeded routine maintenance opex costs. Expenditure on compressor fuel has also been growing steadily over time, by 3% per year on average between 2014 and 2021.

Business support and system operations and network support operating costs had been decreasing between 2017 and 2019 following First Gas’ acquisition, but have increased since

263. Due to the recategorisation of opex costs between ‘business support’ and ‘system operations and network support’ in 2017, it is helpful to view these trends together. Figure 96 shows gas transmission businesses’ ‘business support’ and ‘system operations and network support’ (SONS) opex between 2014 and 2021.

Figure 96: Gas transmission businesses’ business support opex and system operations and network support opex, 2014-2021



264. Business support opex had increased by $6.6m between 2014 and 2016, while SONS opex had decreased by $1.3m over the same period. Both business support and SONS began to trend downward between 2017 and 2019, decreasing by $2m and $0.4m per year respectively before increasing again in 2020. The 2020 increase in business support opex is associated with an increase in insurance costs, which hides the decrease in business support costs associated with capitalisation of leases described in paragraph 245. As described in paragraph 260, business support opex increased in 2021 due to the writing off of the GTAC project assets. 2021 SONS opex remains in line with 2017-2019 at $7.6m, after a smaller increase in 2020 due to deferred capex and maintenance work.[44]

[44] The capex and maintenance work would normally be charged to capex and maintenance opex but remained in network support opex, with the work being deferred due to the first COVID-19 pandemic lockdown in 2020.

Interruptions of gas transmission services are infrequent and brief, with rigorous quality standards detailed in two regulatory regimes

265. Interruptions opex is relatively small for gas transmission businesses and unplanned interruptions in gas transmission systems tend to be infrequent and brief in duration. Interruptions of gas transmission services have the potential to significantly impact many consumers if they do occur, so First Gas is subject to two sets of regulation relating to service quality standards:

    265.1 The Gas Governance (Critical Contingency Management) Regulations 2008 sets out the arrangements for the transmission system owner (**TSO** (First Gas)) to respond to serious emergencies. Under these regulations, the TSO must create a Critical Contingency Management Plan (**CCMP**) that is approved by the GIC. The CCMP includes the types of events that may result in a breach of a Critical Contingency threshold (ie, time until a transmission pipeline falls below a specified minimum pressure) and details the processes to restore the system to normal operations, including curtailment of demand in "bands".[45]

    265.2 Under PQ regulation of gas transmission services, there must be no major interruptions (in addition to response time to any emergency not exceeding 180 minutes, as is the case for local gas pipeline businesses), where major interruptions are breaches of a Critical Contingency threshold that result in demand curtailment directions being issued above band 1.[46]

266. As such, this report does not consider interruption and outage metrics for gas transmission businesses to the level of detail applied to local gas pipeline businesses.

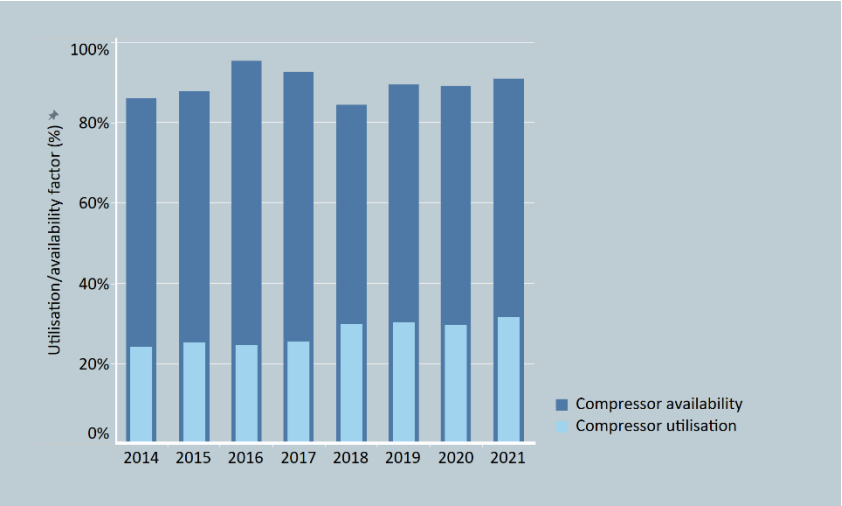
Compressor utilisation has increased markedly since 2018

267. Given the increasing compressor fuel use opex costs, particularly since 2018, we have examined how compressors have generally been used on the transmission system over time. Figure 97 shows the average compressor unit utilisation and availability across gas transmission businesses between 2014 and 2020.

[45] Critical Contingency Operator "Firstgas Critical Contingency Management Plan", page 54

[46] *Commerce Act (Gas Transmission Services Default Price-Quality Path)* Determination 2017 [2017] NZCC 14. See also ibid; the CCMP provides detail on the various curtailment bands from 0 to 7. Band 1 refers to consumers (excluding essential service providers) of more than 15 TJ per day who are supplied directly from the transmission system and have an alternative fuel capability.

Figure 97: Average compressor unit utilisation and availability for gas transmission businesses, 2014-2021



268. The average availability of all compressor units is generally high, sitting close to 90%. Average availability peaked in 2017 with the commissioning of the Henderson compressor station to meet NZ Refining's requirement for greater gas volumes. Average utilisation sat around 25% between 2014 and 2017, and stepped up in 2018 to 30% following a series of compressor upgrade projects. It has remained relatively high since then.

269. Figure 98 shows the total number of times a compressor unit failed to start, between 2014 and 2021, while Figure 99 shows the total number of instances in which a compressor unit was unavailable when required between 2014 and 2021.

Figure 98: Total number of times a compressor unit failed to start, 2014-2021

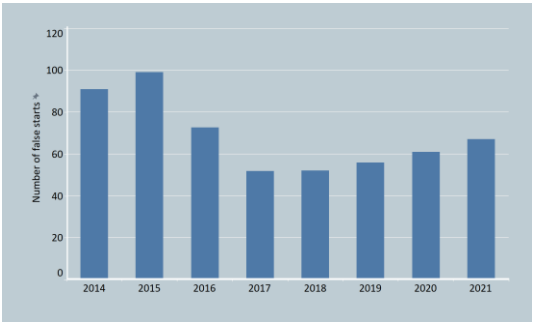
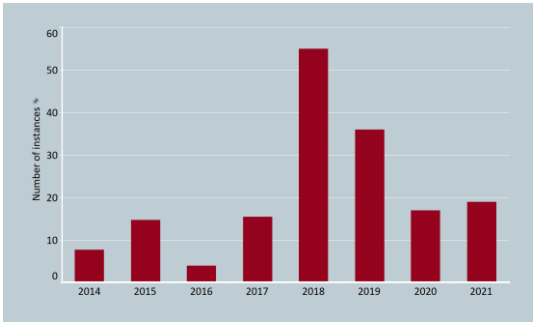


Figure 99: Total number of instances in which a compressor unit was unavailable when required, 2014-2021



270. Compressor reliability in terms of failed starts has visibly improved since 2015 but has been rising slowly over the last four years. The compressor units in Kaitoke (near Whanganui) were responsible for most of the failed starts until 2018. The Kaitoke compressor runs as required (rather than continuously) but has a critical role in delivering gas supply to

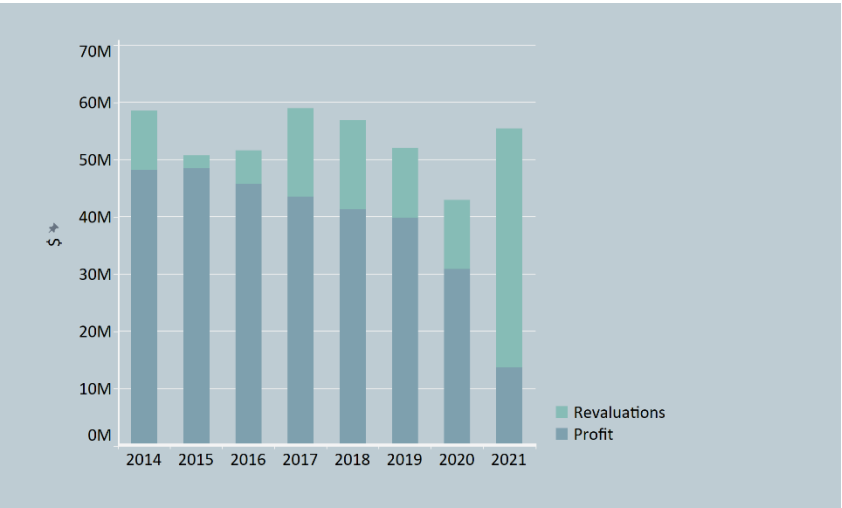
Wellington in winter, so had control and cooling systems upgrades undertaken over several years, which were completed in 2018 and 2019 respectively.

271. The number of instances of compressors being unavailable when required increased significantly in 2018 but has been decreasing since then, despite a slight uptick in 2021. The Henderson and Mokau compressor stations have been responsible for most of these instances of unavailability. The slight improvement in 2019 was due to the Mokau compressors becoming more reliable following project works (the Mokau compressors had fewer instances of unavailability in 2020 also). The Henderson compressor units (which came online in 2017) are the only ones in First Gas' compressor fleet that are driven by electric motors, and instances of unavailability have been related to electricity supply issues in the geographical area of the compressor. Electricity supply issues to the Henderson compressor were less frequent in 2020, leading to fewer instances of unavailability when required. In 2021, there were a higher number of electrical supply issues for the Henderson compressor, resulting in the slight uptick in instances of compressors being unavailable when required. First Gas is investigating options for backup power supply to the Henderson compressor, in the event of electricity network outages (which have historically been common in this network area).

Gas transmission business profit has decreased by $4.9m per year on average between 2014 and 2021

272. Gas transmission businesses made $55.4m in regulatory profit in 2021, made up of $13.7m in cash profit and $41.7m in asset revaluations. Figure 100 shows the trend in cash profit after tax and revaluations for gas transmission businesses between 2014 and 2021.

Figure 100: Gas transmission businesses' total regulatory profit after tax, 2014-2021



273. Cash profit has been decreasing steadily since 2014, by $34.6m over the seven years to 2021. The sharp decrease in 2021 had two main drivers: the increase in opex from reclassification of SaaS and, primarily, the discontinuation of the GTAC project, which resulted in a shifting of expenses from capex to opex during the financial year. Asset

revaluations have increased by $31.4m since 2014, with the largest increase in 2021 due to higher inflation.

274. Cash profits had been decreasing due to reductions in interest rates for the majority of the eight-year period between 2014 and 2021, which meant the cost of capital to invest reduced. We reflected this in a change to the return we allowed the local gas pipeline businesses to earn on their investments for a five-year period starting in 2018. This meant that cash profit from 2018 did not need to be as high to ensure that local gas pipeline businesses were fairly compensated for their investments, which resulted in a decrease in profit of 16.5% per year on average, or 71.6% in total since 2014.

275. Non-cash gains from asset revaluations are driven by changes in the underlying RAB, and changes in inflation, which does not have an immediate impact on customers' bills. Figure 73 showed that inflation was comparatively high in 2014 and from 2017 onwards, which resulted in larger asset revaluation gains in 2014 and between 2017 and 2021. Inflation in 2021 was particularly high, further driving the increase in asset revaluations.

Gas transmission businesses have generally not made excessive profits over the last eight years

276. By comparing the return on investment for a gas transmission business to its cost to invest (or WACC), it is possible to assess whether the gas transmission business is making excessive profit (ie, profit beyond what they would be expected to be earn if they were fairly compensated for their investments).

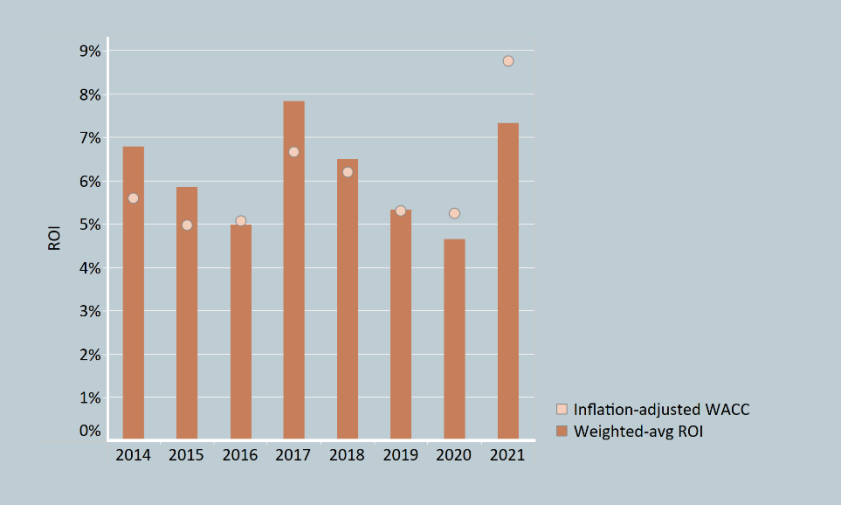
277. Figure 101 shows:

277.1 the return on investment: total regulatory profit after tax expressed as a percentage of the total value of assets for gas transmission businesses between 2014 and 2021, and

277.2 the required rate of return we estimated at the time of setting each DPP, after tax and adjusted for the difference between forecast inflation (incorporated as an input into modelling) and ex-post inflation.

278. Comparing the rate of return on investment to an adjusted WACC is intended to represent a comparison in real terms. Comparison of the return on investment and estimated WACC in real terms is consistent with us setting price-quality paths by applying the principle of ex ante real financial capital maintenance.

Figure 101: Gas transmission businesses' return on investment vs post-tax WACC adjusted for ex-post inflation, 2014-2021



279. The return on investment for gas transmission businesses has generally been in line with the ex-post estimate of their cost to invest. The 2017 return on investment figure exceeds the adjusted cost to invest for two reasons. First, it is across a 15-month reporting period following First Gas' acquisition of both transmission pipeline systems by First Gas and alignment of disclosure periods, which includes two winters and thus slightly increased line charge revenues. Secondly, opex costs were lower than expected. First Gas' return on investment is higher in 2021 compared to 2020 due to the increase in inflation. Inflation also affected the adjusted WACC, which resulted in a higher WACC than in the previous seven years to 2020.

280. Our estimate of the WACC that we used to set price-quality paths for gas transmission businesses was 6.77% after tax for the 2013 to 2017 disclosure years and 5.85% after tax for the 2018 to 2022 disclosure years. Ex-post inflation was lower for every quarter than the forecast inflation used in setting the 2013-2017 DPP, resulting in adjusted WACC figures between 4.97% and 6.67%. Ex-post inflation has been generally higher, prior to 2020,) than the inflation used in setting the 2017-2022 DPP, resulting in adjusted WACC figures between 5.25% and 8.76%. Overall, returns were generally in line with these levels, suggesting that gas transmission businesses have generally not made excessive returns over the last eight years.

Appendix A – Glossary

Abbreviation	Definition
AMP	Asset Management Plan
ARR	Asset replacement and renewal (expenditure category)
Capex	Capital expenditure
CCMP	Critical contingency management plan
CPI	Consumer price index
CPP	Customised price-quality path
DPP	Default price-quality path
DRS	District Regulation Station
GIC	Gas Industry Company
GJ	Gigajoule, 0.001 terajoules
GTAC	Gas transmission access code
ICP	Installation Control Point
ID	Information Disclosure
MAR	Maximum allowable revenue
MBIE	Ministry of Business, Innovation and Employment
MDL	Maui Development Limited
Opex	Operational expenditure
PQ	Price-quality
RAB	Regulated asset base
SaaS	Software as a Service
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory control and data acquisition
SONS	System operations and network support (expenditure category)
TCSD	Term credit spread differential
TJ	Terajoule, 1000 gigajoules
TSO	Transmission system owner
WACC	Weighted-average cost of capital
WAPC	Weighted average price cap