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Trends in gas pipeline businesses' performance

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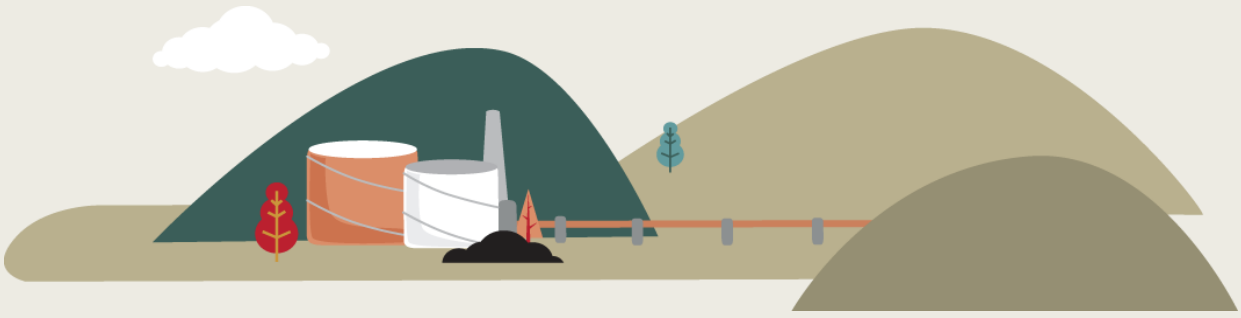


Contents

Executive summary

Purpose of the report

X1. This report provides a summary and analyses of gas pipeline businesses' performance. The information will help stakeholders gain a better understanding of gas pipeline businesses' performance, their relative performance, and any changes in performance over time. Gas pipeline businesses include gas distribution businesses (hereafter referred to as local gas pipeline businesses) and gas transmission businesses.

X2. 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. However, we note that this report is backwards looking, with the intention of tracking change over time and allowing trends in gas pipeline businesses' performance and investment to be observed.

The analysis in this report will be of interest to stakeholders and we welcome your feedback

X3. 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 and services of gas pipeline businesses reflect an industry that works efficiently, reliably, and to the long-term benefit of customers.

X4. 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 third iteration of this report; the previous version was published in February 2023. We welcome feedback to help improve the depth and quality of our insights in future analysis.[1]

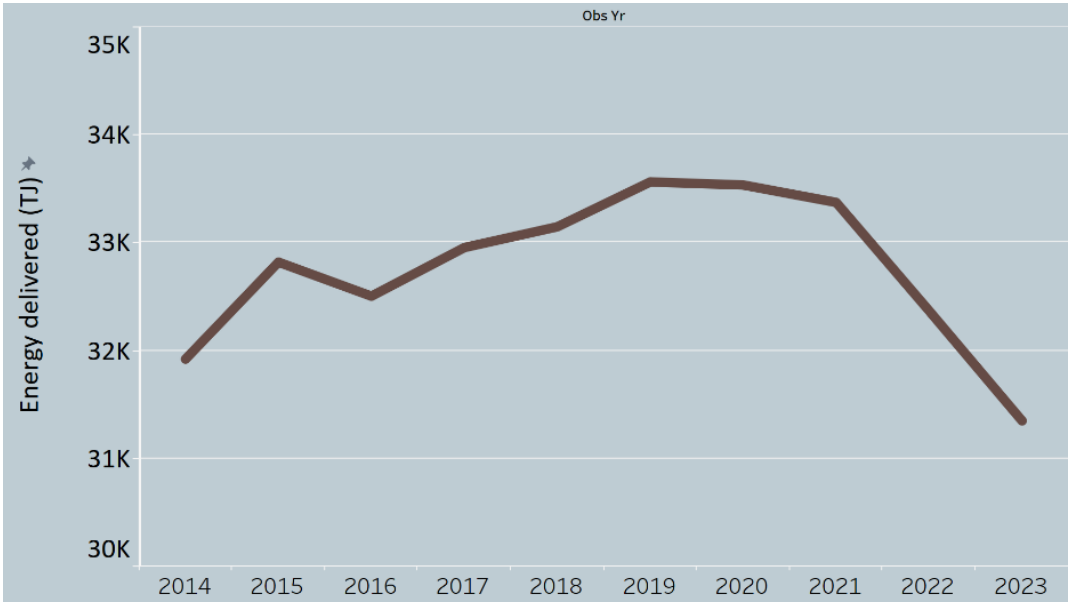
Key trends

X5. This Trends Report covers a range of performance information between 2014 and 2023, with updated data from the 2023 information disclosures. We have identified a series of specific trends that are relevant and most useful to readers.

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

X6. The key trends in the last two years since the last report are the decrease in the volume of energy delivered, increase in customer connections, changes in revenue, higher levels of regulatory profit, and generally improving levels of reliability.

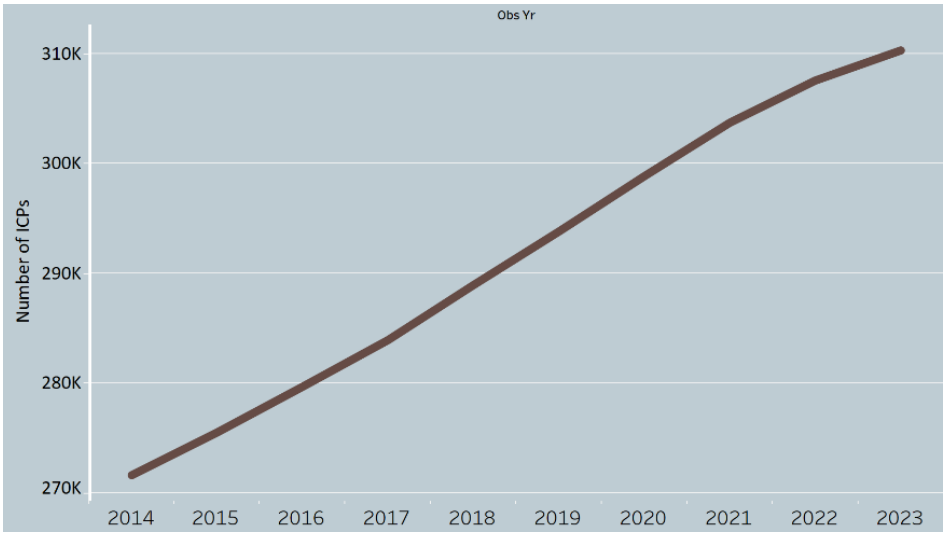
Volume of energy delivered



X7. The volume of energy delivered through local gas pipelines has been relatively stable, with a slight increase from 2016 to 2019. There has been a noticeable fall in the volume of energy delivered since 2021.

X8. The decrease in energy delivered was attributed to large industrial users exiting the industry. The main driver in the decrease was due to industrial users disconnecting from the gas pipeline system, driven by higher gas costs and the switch away from gas to electricity. This decrease was in line with our prediction under the third default price-quality path reset (**DPP3**) for gas pipeline businesses, although the pace of decline was quicker than anticipated.

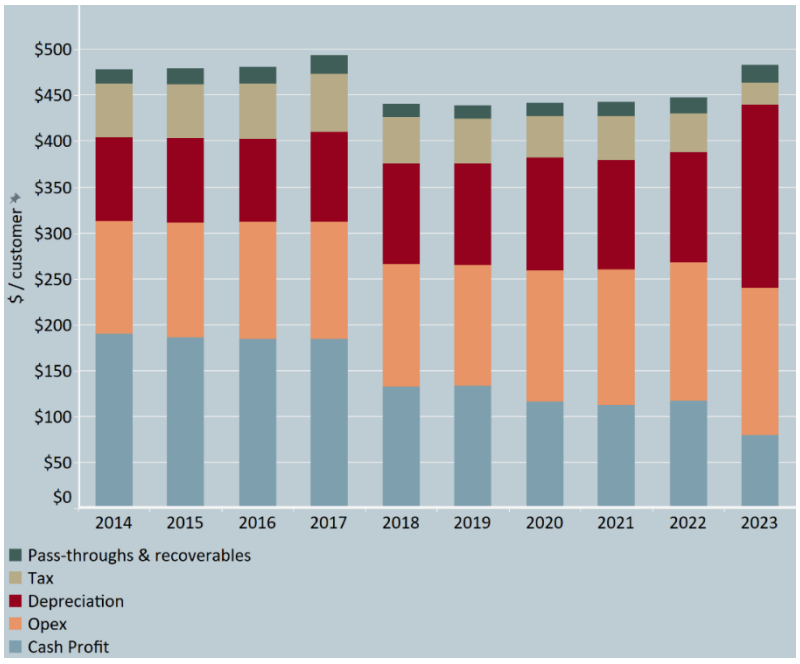
Customer connections



X9. The number of customers connected to local gas pipeline businesses has increased by 1.3% per year since 2014 to 310,308 connections in 2023, with growth largely from residential and small business connections. However, there was a small decline of customer connections from industrial and non-standard businesses during this period.

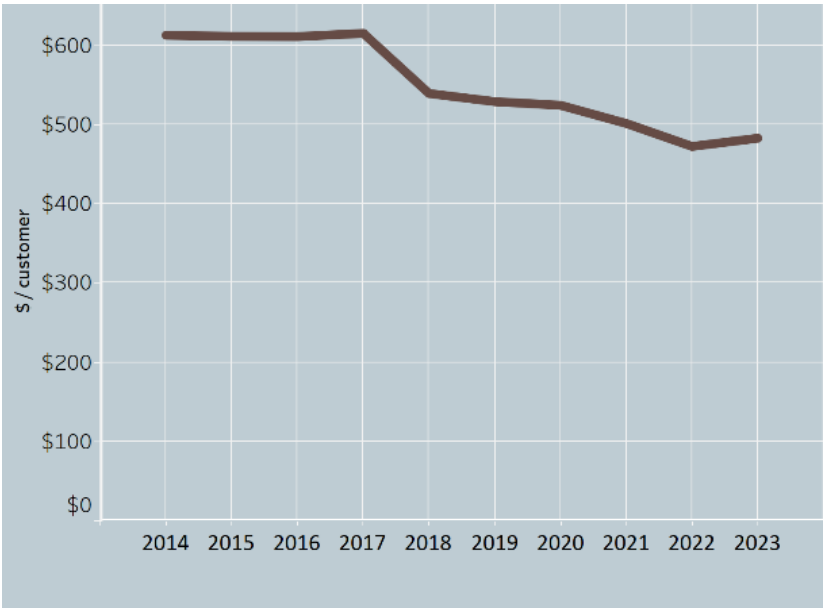
Revenue breakdown

X10. Revenue per customer for local gas pipeline businesses was relatively stable between 2014 and 2023. On average, customers paid $4 more per year in 2023 than they did in 2014. Cash profit decreased but depreciation increased in 2023 because of the shortened asset lives allowed in DPP3.

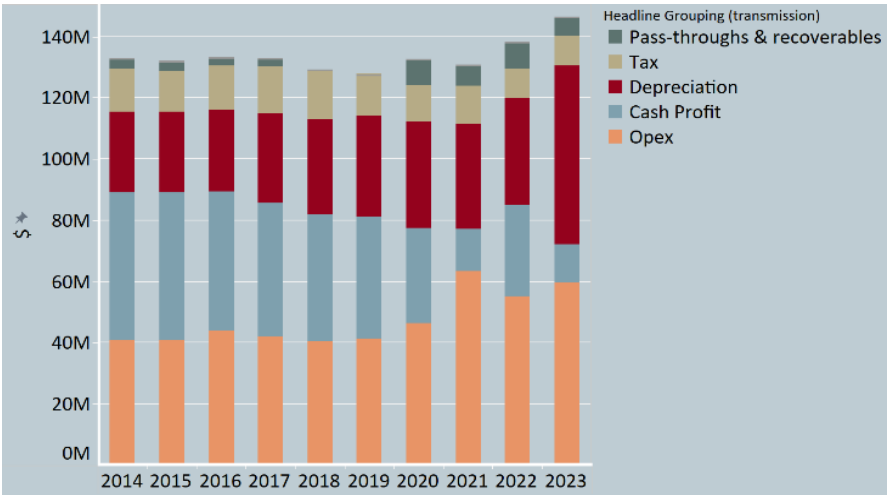


Trends in gas pipeline businesses' performance: 2014 to 2023

X11. However, once inflation is accounted for, local gas pipeline businesses' revenue per customer decreased by $130, or 21.3% in real terms since 2014.

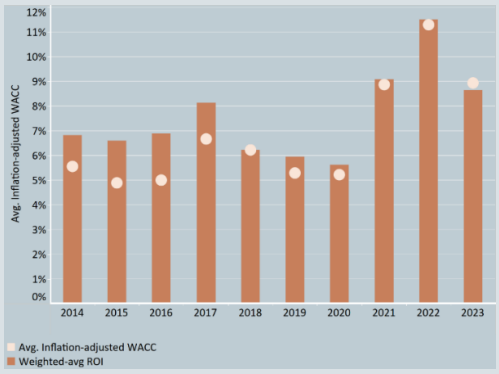


X12. Gas transmission businesses' revenue increased by $13.6 million (10.2%) between 2014 and 2023. In 2023, cash profit decreased noticeably but depreciation increased due to the shortened asset lives allowed in the Gas DPP3. Once inflation is accounted for real revenue decreased by $23.8 million or 14.0% between 2014 and 2023

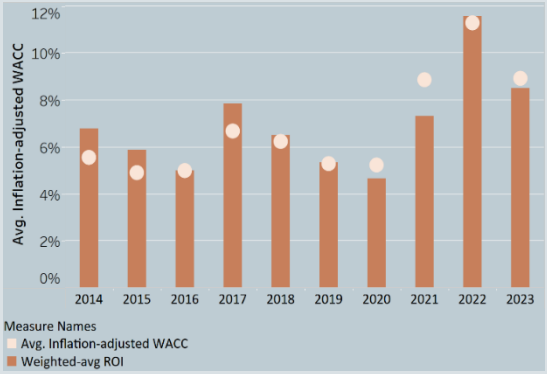


Profitability

Local gas pipeline businesses' return on investment compared to the inflation adjusted WACC, 2014 - 2023



Gas transmission businesses' return on investment compared to the inflation adjusted WACC, 2014 – 2023



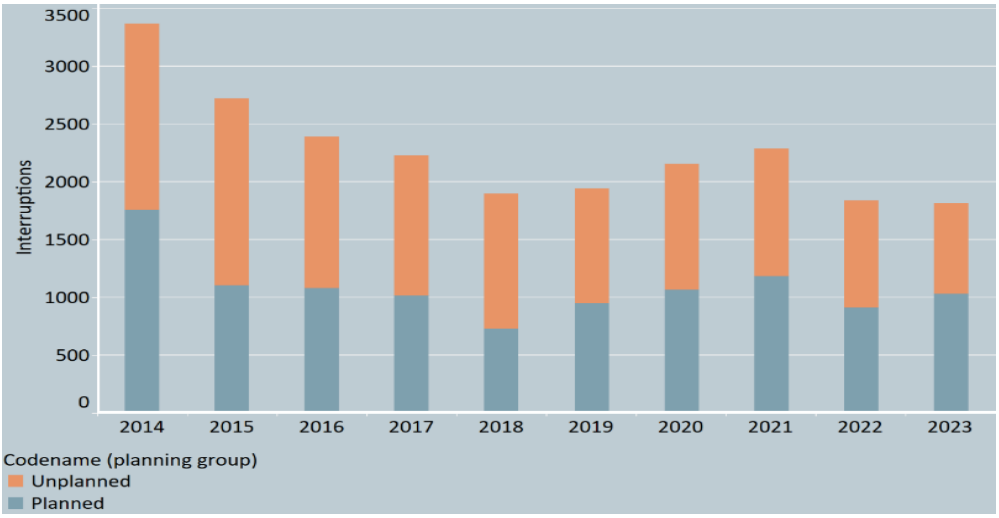
X13. Local gas pipeline businesses have generally not made excessive profits between 2014 and 2023. We draw this conclusion by comparing these businesses' return on investment to the weighted average cost of capital (**WACC**), which is the cost to invest for businesses. The inflation adjusted WACC has ranged from 4.97% to 11% during this period. For gas transmission businesses, the return on investment has generally been in line with inflation adjusted WACC.

X14. The return on investment (**ROI**) for each local gas pipeline and gas transmission business is consistent with the WACC that we estimate when we set their default price-quality paths (**DPPs**).

X15. Higher profits in the most recent three years were driven by higher levels of asset revaluations (inflation), and higher levels of depreciation due to shortened assets lives under DPP3.

X16. The profit referred to here is regulatory profit, which includes cash profit and asset revaluations, and excludes tax.

Reliability



X17. Between 2014 and 2023, the reliability of local gas pipeline businesses has generally improved, with fewer interruptions over time. The number of interruptions generally decreased between 2014 and 2023, by 46% over this period. We refer to reliability at an industry level, rather than specific gas pipeline businesses. For some individual gas pipeline businesses, reliability may have deteriorated in specific years.

X18. The number of emergencies on local gas business also decreased between 2014 and 2023, by 54.9% during this period.

X19. Gas transmission businesses' reliability has also improved over the 2014-2023 period. The number of interruptions over the period has fallen from over 60 to around 20 per year.

X20. We have listed the key performance data of gas pipeline businesses in the table below.

	Local gas pipeline businesses	**Gas transmission businesses**
Revenue	$150 million in 2023 (increase of $19.9 million since 2014)	$146 million in 2023 (increase of $13.6 million since 2014)
Cash profit	Decrease of $26.9 million or 7.1% per year on average, between 2014 and 2023	Decrease of $35.5 million or 12.4% per year on average, between 2014 and 2023

Depreciation as a percentage of revenue	41% in 2023	39.9% in 2023
Opex as a percentage of revenue	33% in 2023	40.4% in 2023
Value of regulated asset base	$1.2 billion in 2023 (increase of $384 million or 45.7% since 2014)	$983 million in 2023 (increase of 24% since 2014)
Interruptions	1817 interruptions in 2023 (decrease of 46% since 2014)	19 (decrease of 43 since 2018)
Emergencies experience by customers	47.2 emergencies in 2023 (decrease of 54.9% since 2014)	339 (increase of 17 since 2018)

The structure of this report

X21. Following this executive summary, the report is structured as follows:

X21.1 Chapter 1 – an introduction to the report, including an overview of our role in regulating gas pipeline businesses;

X21.2 Chapter 2 – local gas pipeline businesses' performance, beginning with an overview of local gas pipeline businesses;

X21.3 Chapter 3 – gas transmission businesses' performance, beginning with an overview of gas transmission businesses; and

X21.4 Appendix A – a glossary of abbreviated terms used within this report.

X22. 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.

Chapter 1 – Introduction

Purpose of the report

1. The purpose of this report is to help people understand the performance of regulated gas distribution and gas transmission businesses (collectively, gas pipeline businesses) between 2014 and 2023. In particular, the price and quality of services delivered by these businesses. This is 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.[2] [3]

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

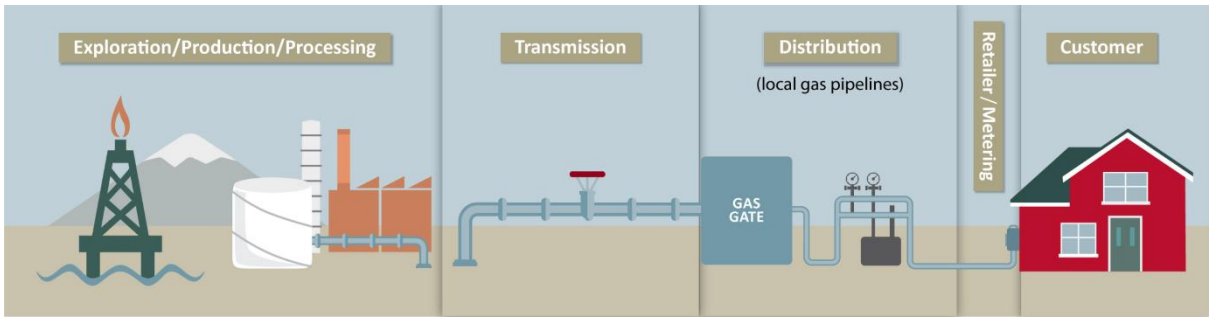
2. The production of natural gas for use by customers begins with exploration, extraction, and processing. Conventional gas producers located around Taranaki process gas for general use, then the gas is injected into high-pressure transmission pipelines (FirstGas) that stretch throughout the North Island.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

3. Wholesalers buy gas from gas producers, and on-sell to gas retailers or directly to customers. In New Zealand, a significant proportion of the natural gas consumed is by large industrial customers who buy gas directly from gas producers. These large industrial customers buy gas under long-term contractual arrangements. Gas retailers contract directly with the gas transmission business and local gas pipeline businesses, to arrange for transport of the gas through to smaller commercial customers, small businesses and households.

[2] Commerce Act 1986, s 52A.

[3] For this analysis, we use data from 2014 to 2023. GasNet and Vector provide their information disclosures for years ending 30 June, while Powerco and FirstGas 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.

Figure 1: Various elements of the natural gas supply chain

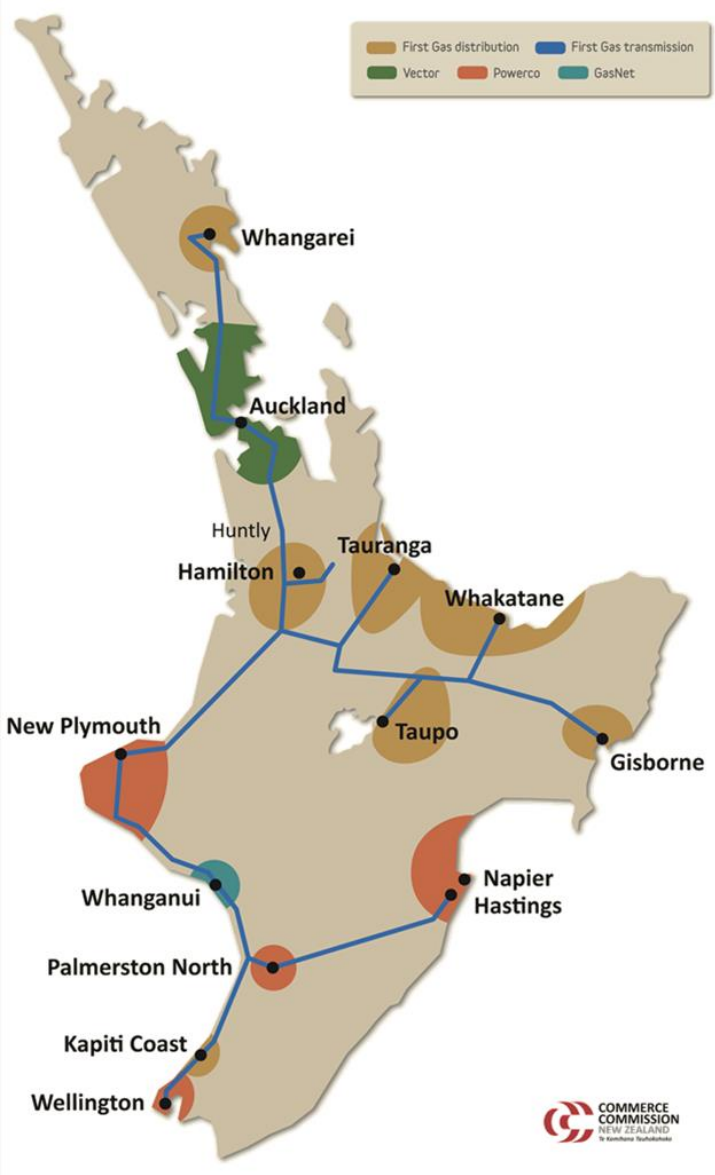


4. FirstGas acquired two transmission pipeline systems in 2016: the pipeline between Taranaki and Huntly from Maui Development Limited (**MDL**), and the remaining gas transmission pipelines from Vector. For the purpose of this analysis, we do not report on each gas transmission pipeline separately.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

5. FirstGas not only owns the transmission pipeline systems but also a local gas pipeline – so 'FirstGas Transmission' and 'FirstGas Distribution' are part of the same company, although each business has separate information disclosures. The information disclosed differs between local gas pipeline businesses and gas transmission businesses. Figure 2 shows a map of the locations of the various local gas networks in the North Island, as well as the location of the gas transmission system.[4]

[4] This report covers the natural gas pipelines in the North Island and does not cover LPG distribution systems in the South Island, as LPG distribution networks are not regulated under Part 4 of the Commerce Act.

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

6. 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 FirstGas) and the gas transmission business, FirstGas.[5]

[5] Not all local nor transmission gas pipelines are regulated e.g., 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 of the Commerce Act.

7. 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 customer demands, while preventing gas pipeline businesses from making excessive profits. We apply two types of regulation to these gas pipeline businesses:

   7.1 price-quality (**PQ**) path regulation, where we set the revenue or price cap that each business can collect from gas customers, and the minimum quality standards they must maintain; and

   7.2 information disclosure (**ID**) regulation, which requires gas pipeline businesses to publish information each year detailing their performance, including pricing, future expenditure forecasts, interruptions, and financial statements. These information disclosures are public information once published. Gas pipeline businesses have been subject to the current ID regime under Part 4 of the Act since 2012, with slight variations in the ID schedule requirements over time.[6]

8. Under Part 4, we are required to summarise and analyse any information that gas pipeline businesses disclose under the ID requirements. This is 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.[7]

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

10. 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 for regulations 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] 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 focused primarily on financial statements. We use data from 2014 onwards due to the lack of granularity in data in 2012 and 2013.
[7] Commerce Act 1986, s 53B(2)(b).

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

11. We use the term 'customers' to mean the entities connected to a local gas pipeline business, which can be households or businesses, or industrial customers 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.

12. In general, most customers do not have a direct relationship with their local gas pipeline business or the gas transmission business. Instead, they engage with a gas retailer (to which they pay their bill). The retailer passes through a portion of this bill (historically this has been roughly 40%-45%) to pay for the transport services of the local gas pipeline business, and the gas pipeline business.

13. We expect this analysis will be of interest to all stakeholders in the gas industry. It is intended to aid customers in determining whether the prices and quality of service from gas pipeline businesses are reflective of an industry that works efficiently, and to the long-term benefit of customers.[8] This analysis is also 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 uncertain

14. The gas sector is in a state of change and uncertainty.[9] Demand for natural gas is decreasing due to the overall decarbonisation of the economy, customers switching to low or zero emissions fuels, and the closure of several large industrial users in recent years.[10] However, the pace of change is uncertain.[11] Future demand for natural gas is forecasted to decrease by between 10% and 25% by 2035, and up to 73% in the longer-term.[12]

15. On the supply side, there are challenges in bringing new natural gas supply to the market. There has been a significant reduction in upstream exploration activity. Drilling activity between 2015 and 2023 averaged 9.5 wells per year, compared with 34 wells per year between 2002 and 2014. Since 2014, the number of permits granted for drilling has decreased, on average, at a rate of 9.7% per year.[13] Supply

[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] Ernst & Young "Gas Industry Company Gas Supply and Demand Study" (8 December 2023) (**GIC Supply and Demand Study**), page 1.
[11] Ernst & Young "GIC Supply and Demand Study", page 1.
[12] Ernst & Young "GIC Supply and Demand Study", page 42.
[13] Ernst & Young "GIC Supply and Demand Study", page 1.

from the larger gas fields such as Maui and Pohukura, which have supplied New Zealand for many years, have decreased in the last decade or so.[14]

16. Overall, forecast modelling show that the supply of natural gas will be insufficient to meet the demand in future years (as early as 2025 or as late as 2034, depending on the specific scenario forecasting).[15] This will contribute to likely future increases in natural gas prices, and potentially further decreases in demand.[16]

17. In its advice to the New Zealand Government on its first three emissions budgets on the pathway to net zero emissions by 2050, the Climate Change Commission (**CCC)**'s report highlighted that the role and nature of the gas network infrastructure will need to be considered as the natural gas supply reduces.[17]

18. It is possible that gas infrastructure could be repurposed, depending on the future development of blended or fully renewable gases. The pace of development of any alternative gases, and the extent to which they will be viable substitutes, will affect future demand for natural gas. In addition, uncertainty about the rate of decline in natural gas creates corresponding uncertainty about when demand for electricity will increase.[18]

19. We note that this report is, to a large extent, backwards looking, with the intention of tracking change between 2014 and 2023. This report provides observations of the trends in the usage and investment of gas pipeline businesses. Therefore, the trends analysis of data from 2014 to 2023 will not reflect the more recent significant changes in the operating environment of the gas sector.

We have published other summary materials alongside this report

20. This is the third iteration of the report, the previous report was published in February 2023. This current version of the report has been updated with data from the 2023 information disclosures. We welcome feedback to help improve the depth and quality of our insights in future reports.

21. This report is supported by materials that highlight our key findings and allow stakeholders to understand the data. The range of materials provide stakeholders with easy access to the information at various levels of interest. Our materials include:

[14] Ernst & Young "GIC Supply and Demand Study", page 61.
[15] Ernst & Young "GIC Supply and Demand Study", pages 1-2.
[16] Ernst & Young "GIC Supply and Demand Study", page 17.
[17] Climate Change Commission, "Ināia tonu nei: a low emissions future for Aotearoa" (31 May 2021), page 277.
[18] Commerce Commission "Context and summary of Final decisions - Part 4 Input Methodologies Review 2023" (13 December 2023), para 2.10.

21.1 an Approach Paper which describes the technical aspects of the analytical approaches we have used, and the legislative context in which we undertook this analysis;

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

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

Other relevant information published

22. In May 2022, we published the default price-quality path (**DPP**) for gas pipeline businesses, effective from 1 October 2022 to 30 September 2026.

23. Further background about New Zealand's gas industry can be found on the GIC website's 'about' page.[19] MBIE's 'Gas statistic page' also provides information about New Zealand's gas infrastructure and industry governance.[20]

[19] See https://www.gasindustry.co.nz/about/about-the-industry/.
[20] 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

24. The purpose of this chapter is to provide an overview of local gas pipeline businesses and the results of our analysis of their performance. Our analysis includes the trends in businesses' revenue, 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, where possible.

25. Trends are first examined from a high-level industry view, in most cases followed by detailed examination at the individual gas pipeline business level. The key findings are based on industry-wide or company averages, and 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.

26. Our analysis refers to the growth implied by the trend, as explained in our Approach paper about our use of trends analysis. There are cases where we refer to single-year figures, or state a figure which is an absolute increase in dollars or dollars per customer.

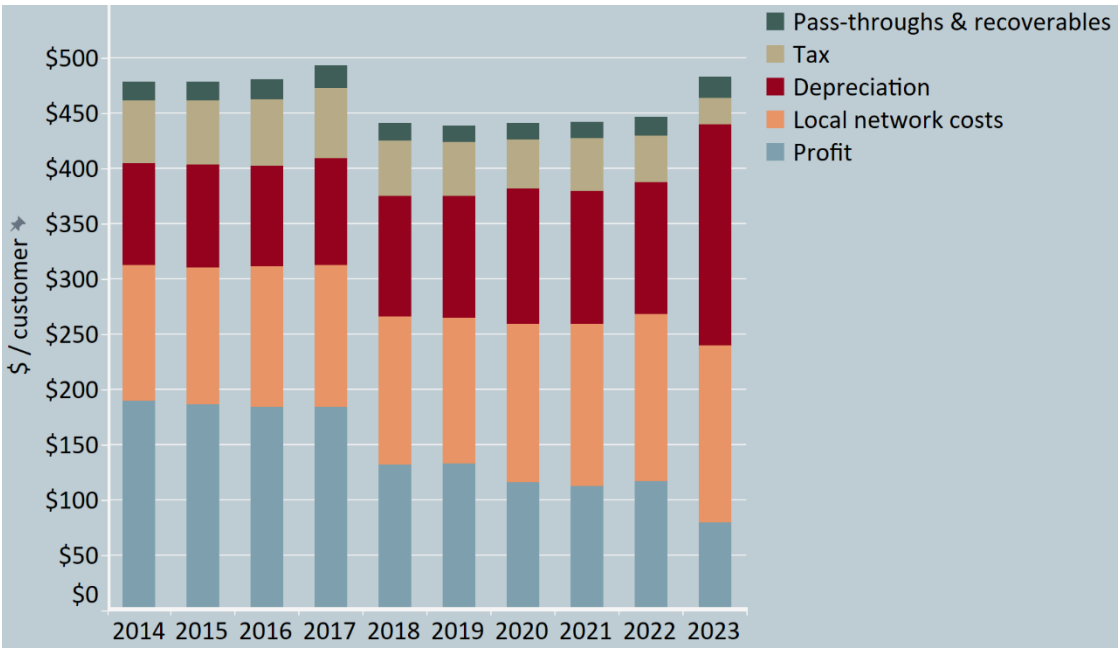
27. Further, unless otherwise stated, the charts and figures for monetary data are given in nominal terms i.e., they have not been adjusted to exclude the impact of inflation.

Key findings

28. The annual revenue that local gas pipeline businesses have collected through providing regulated services has increased by $19.9 million since 2014, to $150 million in 2023. On average, customers pay $483 per year, which is $4 more (in nominal terms) than they did in 2014. Once general price inflation is accounted for, local gas pipeline businesses' revenues have fallen on average, by $54 per customer (in real terms) since 2014 or by 11.3%.

29. Figure 3 shows the breakdown of the average revenue per customer between 2014 and 2023.

Figure 3: Breakdown of local gas pipeline businesses' revenue per customer, 2014-2023



30. There are five components of revenue for local gas pipeline businesses: pass-through and recoverable costs, tax, depreciation, operating expenditure (also known as opex, and referred to in Figure 3 as local network costs), and profit. These components of revenue are explained in greater detail under Figure 12.

31. Between 2014 and 2023, the components of revenue that have increased are opex and depreciation. Opex accounted for 30% of revenue per customer for local gas pipeline businesses during this period. Opex increased by 3% per year on average between 2014 and 2023, resulting in customers paying $161 for this category of expenditure in 2023 (an increase of $38 from 2014).

32. There has been a gradual increase in depreciation (in nominal terms); however, there was a marked increase in 2023 due to shortened asset lives under DPP3. The annual capital expenditure (**capex**) of local gas pipeline businesses was 24% higher in 2023 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 between 2014 and 2022. Depreciation accounted for 25% of revenue per customer for local gas pipeline businesses from 2014 to 2023. Depreciation increased by 8% per year on average between 2014 and 2023. This resulted in customers paying $200 for this expenditure category in 2023 (an increase of $109 from 2014).

33. The RAB (upon which the total return on assets is based) of all local gas pipeline businesses was collectively valued at over $1.2 billion in 2023, an increase of $384 million (45.7%) since 2014.

34. Investment in local gas pipeline networks has focussed on supporting growth on networks and maintaining assets. Investment in new connections and system growth has increased by $8.3 million since 2014, while investment in maintaining assets has been consistent over time.

35. Network relocation and capitalised financing costs form a comparatively small portion of capex. However, network relocation capex has a high degree of customer visibility as these costs are often offset partially by capital contributions from the customers who seek relocation. Customers also make contributions toward the capital cost of new connections. On a per new customer basis since 2014, capital contributions have increased from $813 to $2,384 by $1,572 in nominal terms or by 194%.

36. Between 2014 and 2023, the cost of running all local gas pipeline businesses (opex) has increased by $15.3 million to $52.1 million. This is an increase of $1.6 million or 4.1% per year on average during this period. Business support costs have grown by $5.8 million or 30.5% since 2014. Albeit a relatively small component of opex, the cost of responding to interruptions and emergencies shows an increasing trend between 2014 and 2023.

37. Cash profit is defined within this report as the total regulatory profit (after tax) and excludes revaluations. Cash profit has declined following the 2017 DPP reset. In 2023, the average cash profit per customer was $80, which is $110 less than the average cash profit per customer in 2014.

38. Local gas companies' reliability has generally improved since 2014. The number of emergencies experienced by customers, and the number of complaints made by customers have decreased significantly. The average duration and frequency of interruptions experienced by customers of local gas pipeline businesses have generally decreased since 2014.

Overview of local gas pipeline businesses

39. 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.

40. Local gas pipeline businesses deliver gas to a range of customers, from households to some large industrial customers.[21] Households and businesses (e.g., greenhouses, hospitals and restaurants) use gas primarily for cooking and heating, while some larger industrial processes may use gas as a feedstock. Table 1 shows the number of customers connected to local gas pipeline businesses, represented by installation control points (**ICPs**), and the average gas volume consumed in gigajoules (**GJ**) by each customer type in the 2023 disclosure period.

Table 1: number of customers and average gas volume consumed by customer type in 2023 (most recent disclosure period)

Customer type	Number of customers	Average volume consumed (GJ/customer/year)
Residential and small business	300,950	25.4
Business and small commercial	6,921	338.1
Medium and large commercial	1,914	1,956
Industrial and Non-standard	525	34,657
Total	**310,310**	**40,019.4**

41. Residential and small business customers far outnumber other gas customers, but on average, each residential and small business customer consumes a relatively small amount of gas. In contrast, very few industrial customers are connected to local gas pipelines but consume over 1,300 times more than residential and small business customers (on average).

42. The local gas pipeline businesses that we regulate are Vector, Powerco, FirstGas and GasNet. Each local gas pipeline business operates in different regions. Within this chapter, "FirstGas" refers to the FirstGas distribution business (i.e., not the gas transmission business).

43. FirstGas began operating as a local gas pipeline business in 2016. Trends shown at the local gas pipeline business level therefore do not include any data for FirstGas

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

prior to 2016. Additionally, Vector's revenues and expenditure in absolute terms are much smaller after 2016 due to the sale of its network outside of Auckland.

44. Table 2 shows the length of each gas pipeline system and the average number of connections per kilometre, at the end of the 2023 disclosure period.

Table 2: Table of local gas pipeline businesses' characteristics in 2023 (most recent disclosure period)

Gas pipeline business	System length at year end (km)	Gas customer density (customers/km) (Average number of customers in disclosure year per system length)
FirstGas Distribution	4,980	14
GasNet	696	14
Powerco	6,227	18
Vector	7,001	17

45. 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. FirstGas 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.

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

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

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

46.3 additional equipment for:

46.3.1 pressure regulation i.e., District Regulation Stations, **DRS**;

46.3.2 isolation i.e., line and service valves;

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

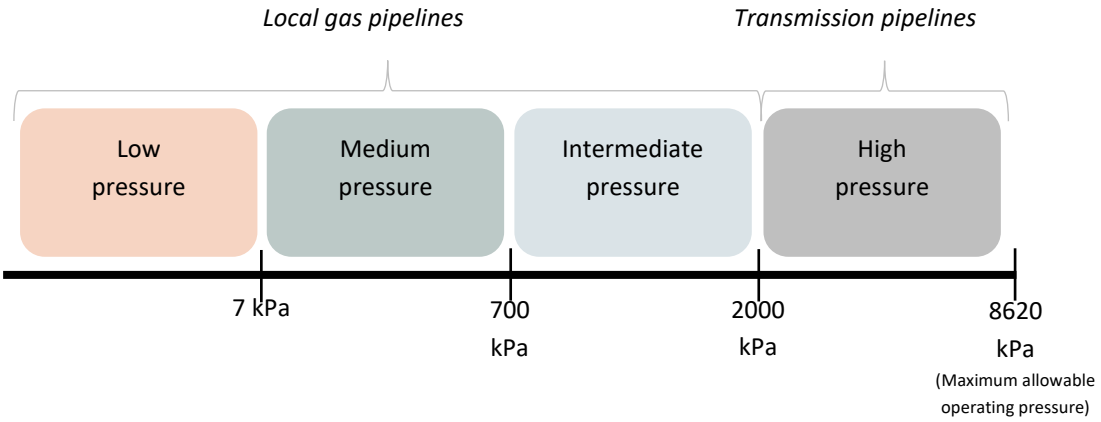
46.3.4 corrosion protection i.e., cathodic protection systems;

46.3.5 safety and protection; and

46.3.6 communication of data i.e., supervisory control and data acquisition (**SCADA**) systems.

47. 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

48. At least every five years, we undertake a review of the DPP that applies to local gas pipeline businesses.[22, 23] The first DPP applied from October 2013 to September 2017. The second DPP applied from October 2017 to September 2022. The most recent DPP reset was completed in May 2022, and applied from 1 October 2022.

49. 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:

    49.1 what the expected return on the regulated assets of the gas pipeline businesses is, as represented by our estimate of the weighted average cost of capital (**WACC**);

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

    49.3 how we forecast the operational expenditure of the local gas pipeline businesses during the regulatory period.

50. 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.

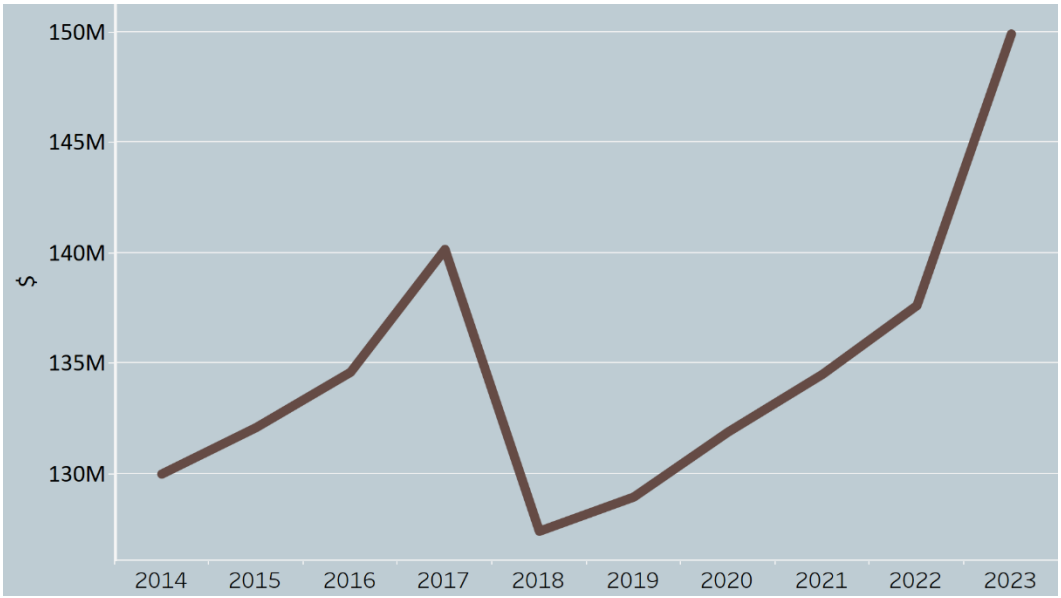
Local gas pipeline businesses are collectively earning $19.9 million more revenue in 2023 than they did in 2014

51. Local gas pipeline businesses recover the cost of providing regulated gas distribution network services by collecting revenue from the gas customers they serve (passed through via a retail bill). The prices they are allowed to charge are determined by

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

price-quality 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 2023 in nominal terms.

Figure 5: Total revenue for all local gas pipeline businesses, 2014-2023

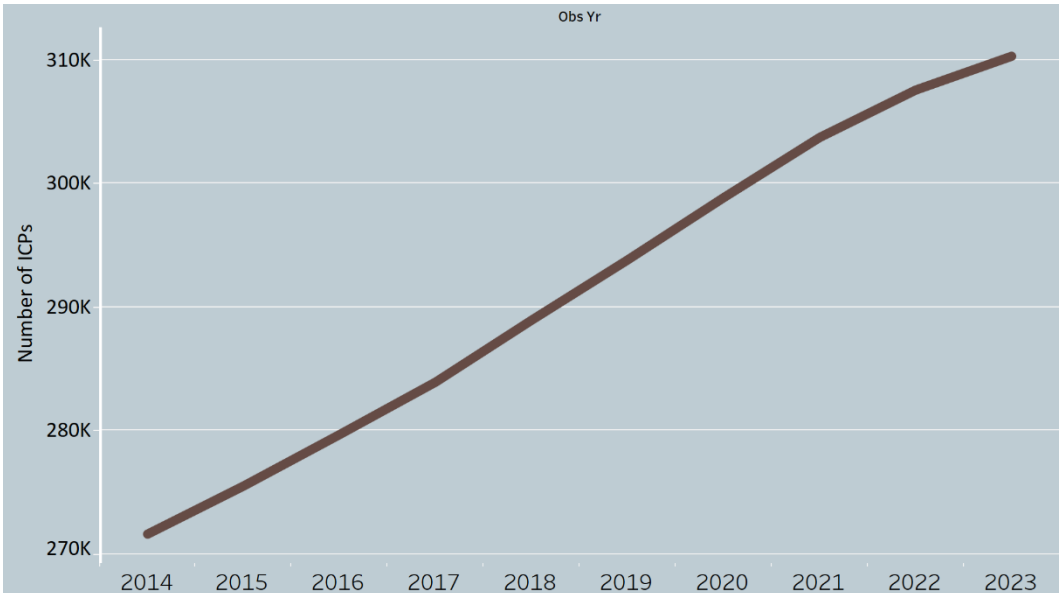


52. The total revenue from local gas pipeline services has increased by $19.9 million (or by 15.3%) from $130 million since 2014. Following the previous peak of $140 million in 2017, total revenue dropped to $127 million in 2018, but has been steadily increasing since then, with a sharp increase of $12.3 million of total revenue between 2022 to 2023. Shortened asset lives played a large role in the increase of depreciation, leading to an increase of revenue in 2023.

Customer connections continue to increase, with growth from residential and small businesses

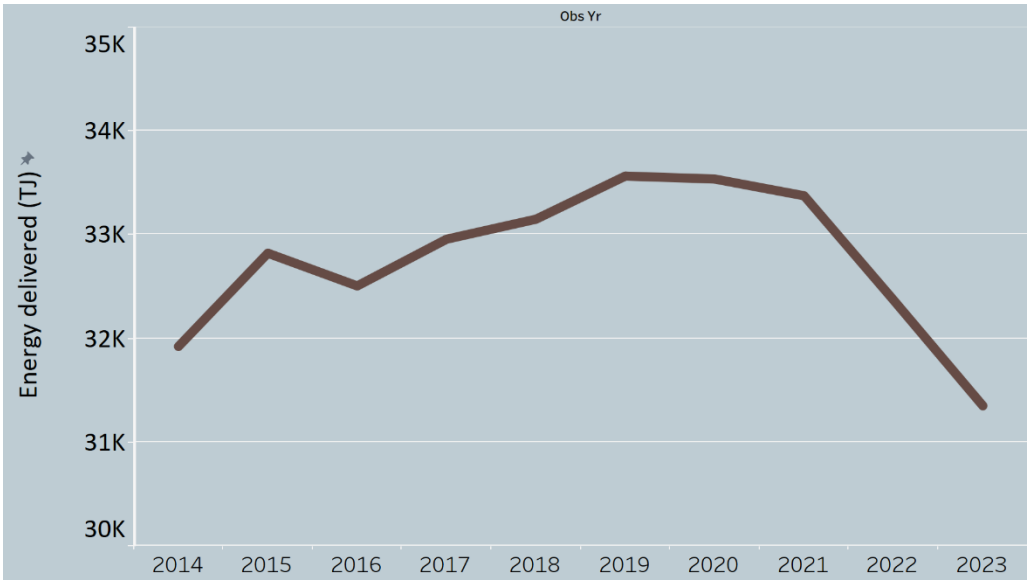
53. Figures 6 and 7 show the total number of ICPs connected to local gas pipelines, and the volumes of gas delivered through these pipelines between 2014 and 2023.

Figure 6: Total number of customers connected to local gas pipelines, 2014-2023



54. The total number of ICPs connected to local gas pipelines has increased by 38,683 since 2014, to 310,308 connections in 2023. The increase has been from residential and small business connections. There was a small decline of customer connections from industrial and non-standard businesses, decreasing by 20 connections between 2014 and 2023. This increase in the number of connections, especially from residential and small businesses to local gas pipelines, is in line with our expectations when we set the third default price-quality path (**DPP3**) in 2022.[24]

Figure 7: Total energy delivered through local gas pipelines, 2014-2023



[24] Commerce Commission "Default price-quality paths for gas pipeline businesses from 1 October 2022 – Final reasons paper" (31 May 2022) (**DPP3 Reasons paper**), page 46.

55. The overall volume of energy delivered through local gas pipelines has decreased by 572.2 terajoules (**TJ**)[25] or 1.8%, between 2014 and 2023, with the decrease attributable to industrial and non-standard businesses. This decrease is very noticeable from 2021 to 2023 with volume decreasing by 2024.8 TJ or 6.1% in these two years alone. When we set DPP3 in 2022, we expected gas usage to decline in the longer term, with relatively flat demand for residential, commercial, and agricultural users, and a fairly slow decline by larger industrial users.[26] However, the decline in the volume of energy delivered has happened at a faster rate and sooner than we expected when setting DPP3, especially for large industrial users.

56. Figure 8A shows the total energy delivered and growth of customer connections (broken down by customer type) for all local gas pipeline businesses between 2014 and 2023. Figure 8B shows the total energy delivered and customer connections in 2022 and 2023.

Figure 8A: Change in energy delivered and customer connections for all local gas pipeline businesses, 2014-2023

	Residential and small business	Business and small commercial	Medium and large commercial	Industrial & Non-standard
Delivered energy (TJ)	300	237	300	-1,409
Connections (ICPs)	37,779	761	163	-20

Figure 8B: Change in energy delivered and customer connections for all local gas pipeline businesses, 2022-2023

	Residential and small business	Business and small commercial	Medium and large commercial	Industrial & Non-standard
Delivered energy (TJ)	-379	-10	9	-1,645
Connections (ICPs)	6,557	10	15	-4

[25] One TJ is equivalent to 1000 GJ.
[26] Commerce Commission "DPP3 Reasons paper", page 46.

57. Between 2014 to 2023, the overall energy delivered decreased, with most of this being attributable to industrial and non-standard users, while other categories (residential and small business, business and small commercial, medium and large commercial) have seen moderate levels of increase.

58. During the past two years (2022-2023), the decrease in the energy delivered has been more pronounced. Energy delivered has fallen across most customer types (residential and small business, business and small commercial, and industrial and non-standard). Of note, is the fairly significant decrease in the energy delivered for industrial and non-standard businesses.

59. The number of customer connections has increased overall in the past decade or so (2014 to 2023), with most of this increase attributable to residential and small business users. Business and small commercial, and medium and large commercial users have experienced moderate increases in the number of connections. However, there was a minor decline in the number of industrial and non-standard users being connected to the local gas pipeline network.

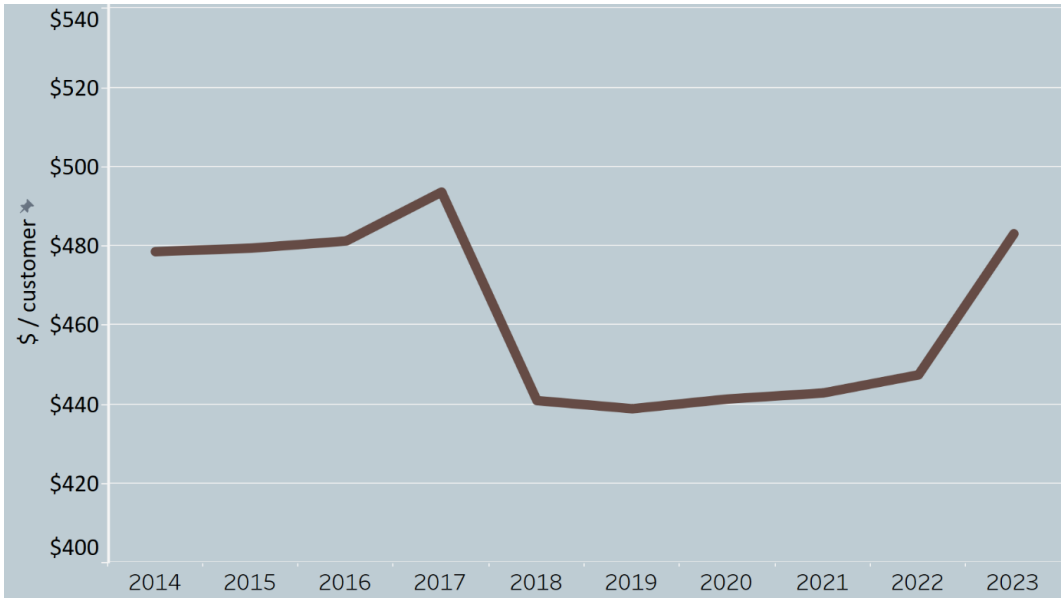
60. The number of customer connections increased during 2022 and 2023, with most of this increase attributable to residential and small businesses. During this period, there was a minor decline of customer connections from industrial and non-standard businesses.

Customers of local gas pipeline businesses are paying $4 more on average in 2023 than they did in 2014

61. Overall, revenues have increased in nominal terms between 2014 and 2023. However, once the impact of inflation has been factored in, revenue has decreased in real terms. The revenue of local gas pipeline businesses has been impacted by factors such as the price-path resets.

62. Figure 9 shows the average revenue per customer across all local gas pipeline businesses from 2014 to 2023.

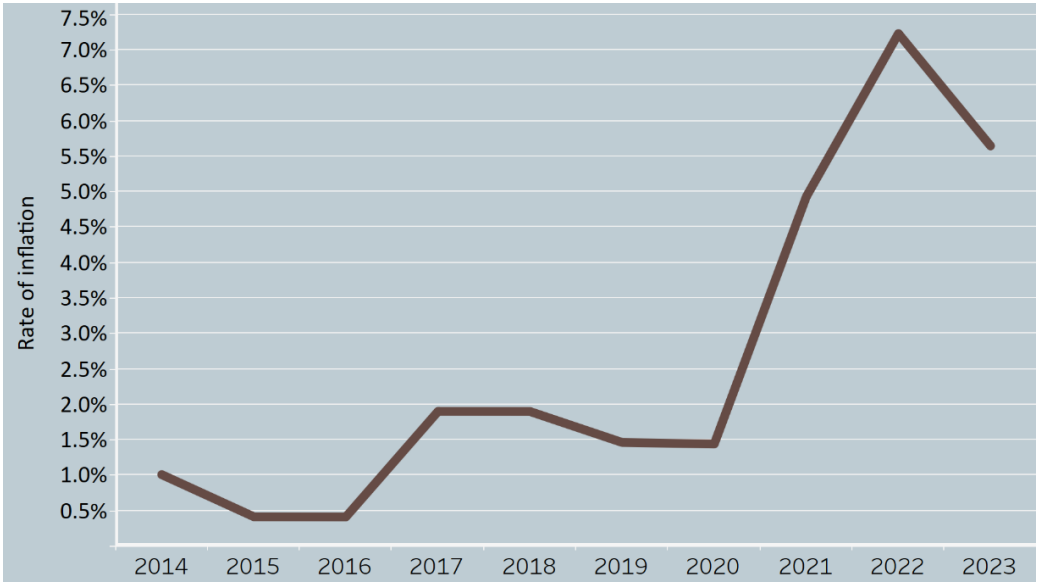
Figure 9: Average revenue per customer across all local gas pipeline businesses, 2014-2023



63. Revenue per customer in 2023 was $483. Revenues have increased by $4 per customer in nominal terms between 2014 and 2023, or by 0.8%.

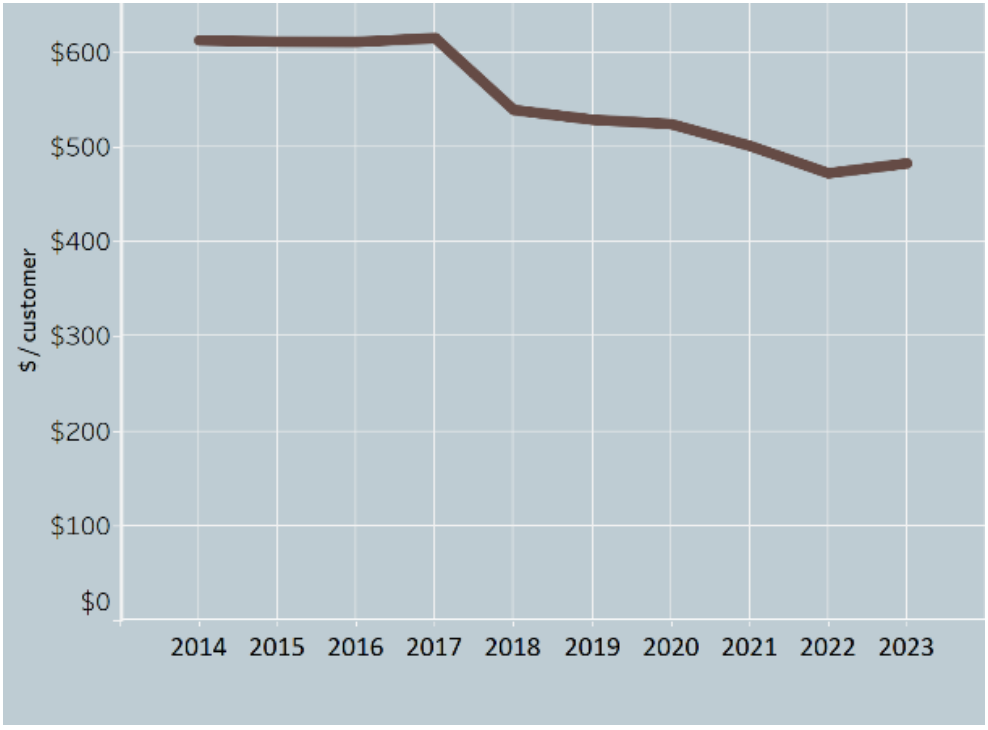
64. The total revenue increase described above reflects the general price pressures, or inflation, that impact the wider economy. Figure 10 shows the change in the consumer price index (**CPI**) used to represent inflation since 2014.

Figure 10: Annual rate of inflation, years ending September, 2014-2023



65. CPI has increased by approximately 2.6% per year on average (29.4% in total) from 2014 to 2023, with the sharpest increase in 2022. Figure 11 shows change in revenue per customer adjusted for inflation (in 'real' terms) since 2014.

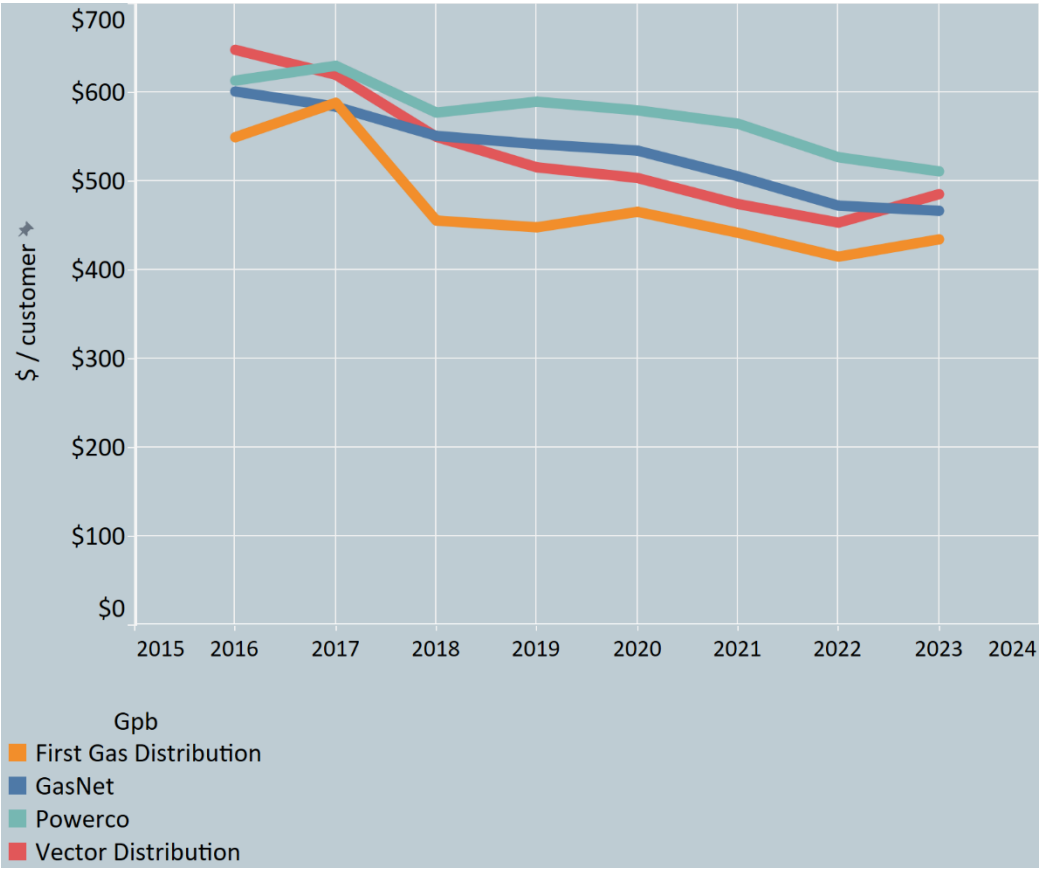
Figure 11: Revenue per customer for all local gas pipeline businesses, adjusted for inflation (in real terms), 2014-2023



66. Using CPI to adjust for inflation, revenues have fallen by $130 per customer in real terms, or 21.3% between 2014 and 2023. Real revenue per customer has an overall decreasing trend over time, between 2014 and 2023.

67. 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 customer for each local gas pipeline businesses, adjusted for inflation, between 2016 and 2023. Note that the data is limited to this range as 2016 was the first disclosure period for the 'FirstGas Distribution' entity, following FirstGas' purchase of Vector's local gas pipelines outside Auckland and transmission gas pipelines.

Figure 12: Total revenue per customer for each local gas pipeline businesses, adjusted for inflation (in real terms), 2016-2023



68. Over the last eight years, all local gas pipeline businesses have seen their revenue per customer decrease in real terms, by between 1% (Powerco) and 2% (Vector) on average per year.

Local gas pipeline business revenue recovers five primary components, with operating expenditure and depreciation comprising 33% and 41% respectively in 2023

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

    69.1 Opex, comprised of costs borne by the pipeline business, and relate to the services the business provides using its assets;

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

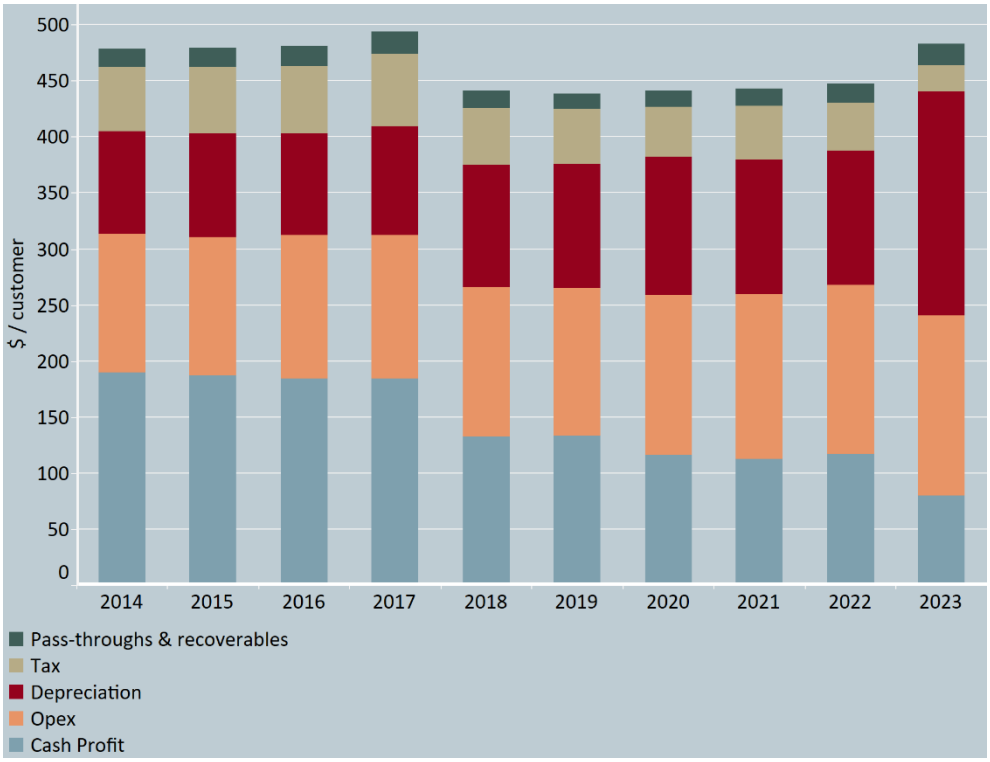
    69.3 A component they retain as cash profit. Cash profit is defined within this report as the total regulatory profit after tax excluding revaluations;

69.4 Tax, which is primarily driven by profit; and

69.5 Pass-through or recoverable costs, which are the costs of services provided by other parties, e.g., rates, levies under the Act and industry levies.[27] 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 below).

70. Figure 13 shows the breakdown of revenue per customer in nominal terms between 2014 and 2023.

Figure 13: Breakdown of local gas pipeline businesses' revenue per customer, 2014-2023



71. At a per-customer level in 2023, depreciation was the largest component of revenue at 41%, followed by opex costs at 33%, and cash profit at 17%. Tax, and pass-through and recoverable costs were comparatively small components of revenue per

[27] 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.

customer. The reason for the significant increase in depreciation in 2023 was because of shortened asset lives that we imposed under DPP3.

Depreciation and operating costs have increased significantly between 2014 and 2023, while cash profit has declined

72. 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 2023, and for each local gas pipeline business individually between 2016 and 2023.

Figure 14: Opex trend across all local gas pipeline businesses, 2014-2023

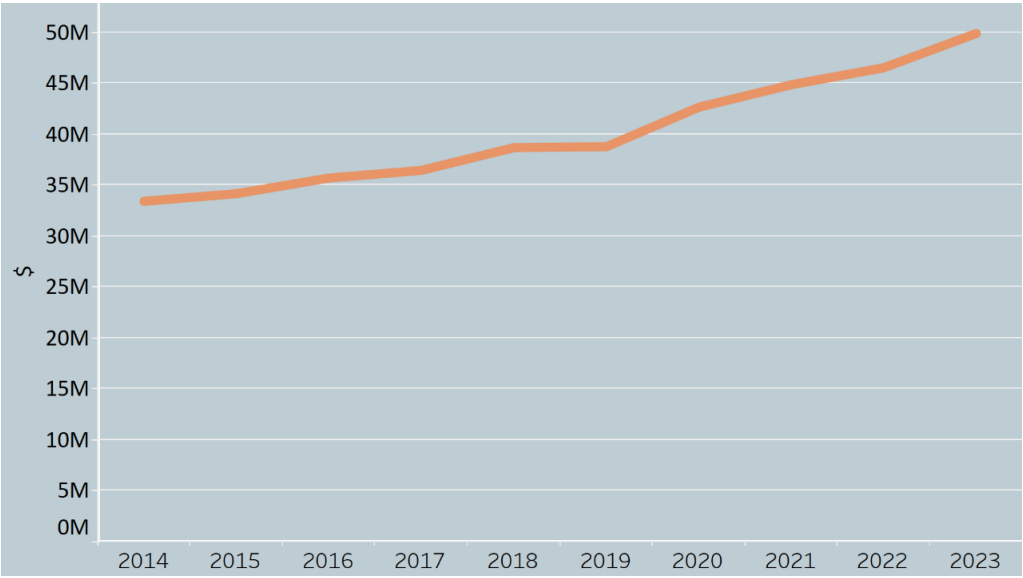
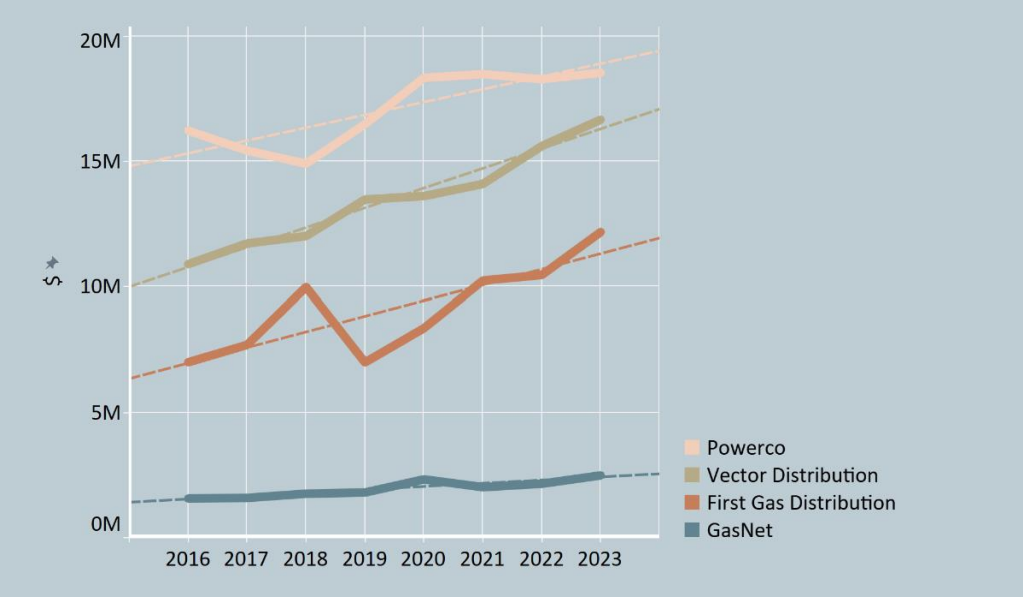


Figure 15: Opex trend for each local gas pipeline business, 2016-2023



73. Opex has increased consistently between 2014 and 2023, by $1.6 million or 49.3%. The trend is similar at a per customer level, but growth in the number of customers has tempered the increase in opex per customer, increasing from $123 per customer to $160 per customer by $38 per customer (31%) during this period.

74. All local gas pipeline businesses have seen increases of between 14% (Powerco) to 56% (GasNet) in their annual opex between 2016 to 2023. Increases in opex have been greatest for Vector and FirstGas, with increases of $5.8 million (53%) and $5.2 million (43%) in nominal terms respectively since 2016.

Figure 16: Depreciation trend across all local gas pipeline businesses, 2014-2023

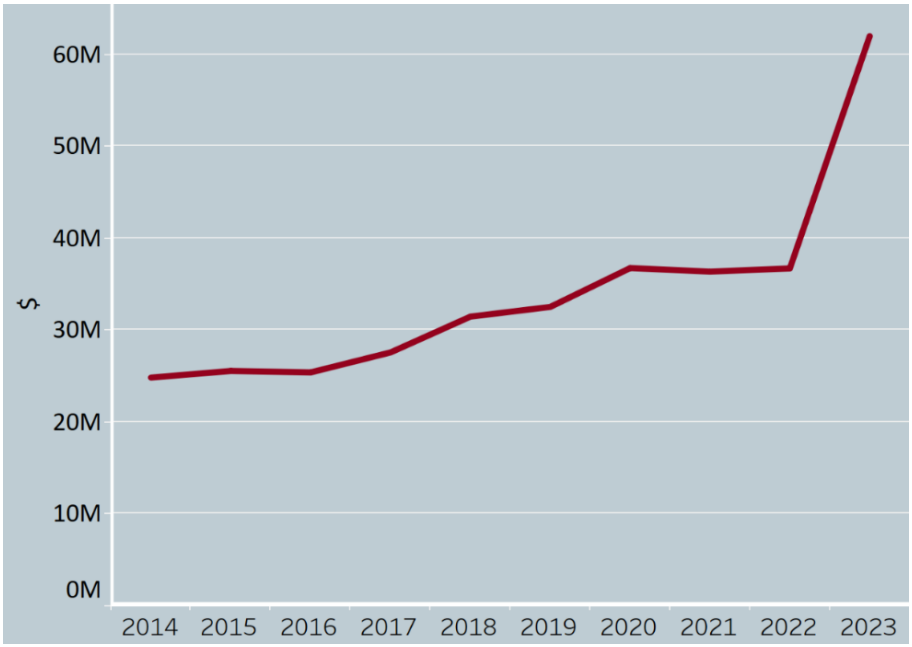
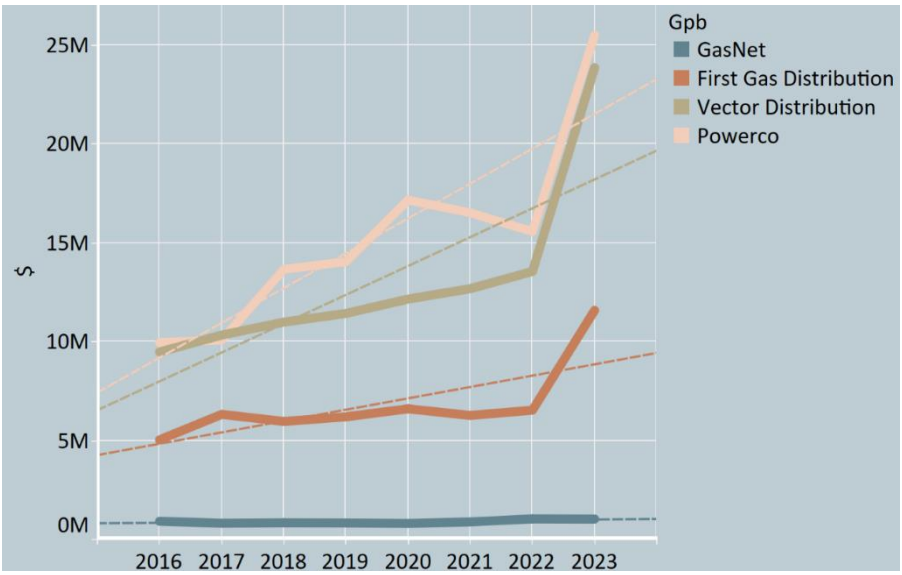


Figure 17: Depreciation trend for each local gas pipeline business, 2016-2023



75. Depreciation has increased by $37.2 million between 2014 to 2023, or 150%. At a customer level, depreciation has increased by $109 (119%) between 2014 and 2023.

76. 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. Between 2016 and 2023, Powerco's depreciation increased by $15.5 million, followed by Vector's increase of $14.4 million, then FirstGas' $6.6 million increase. GasNet's depreciation has remained relatively flat between 2016 to 2023.

77. In DPP3, we shortened the asset lives of gas pipeline businesses due to the expected decline in demand for gas in the longer-term. Prior to DPP3, we assumed that gas pipeline businesses' assets would have economic lives that approximated with their physical lives. Due to the expected decline in demand for gas and the potential for network closure, gas pipeline assets will have shorter economic lives than previously assumed.

78. Under DPP3, we shortened the regulatory asset lives of the network to better match the timeframe during which the network is expected to convey gas. This resulted in a shorter period for recovering gas pipeline businesses' asset investment, and an increased allowance for depreciation under DPP3.

79. In 2023, depreciation increased significantly for Vector, Powerco and FirstGas due to shortened asset lives being applied under DPP3, effective from October 2022.

Figure 18: Cash profit trend across all local gas pipeline businesses, 2014-2023

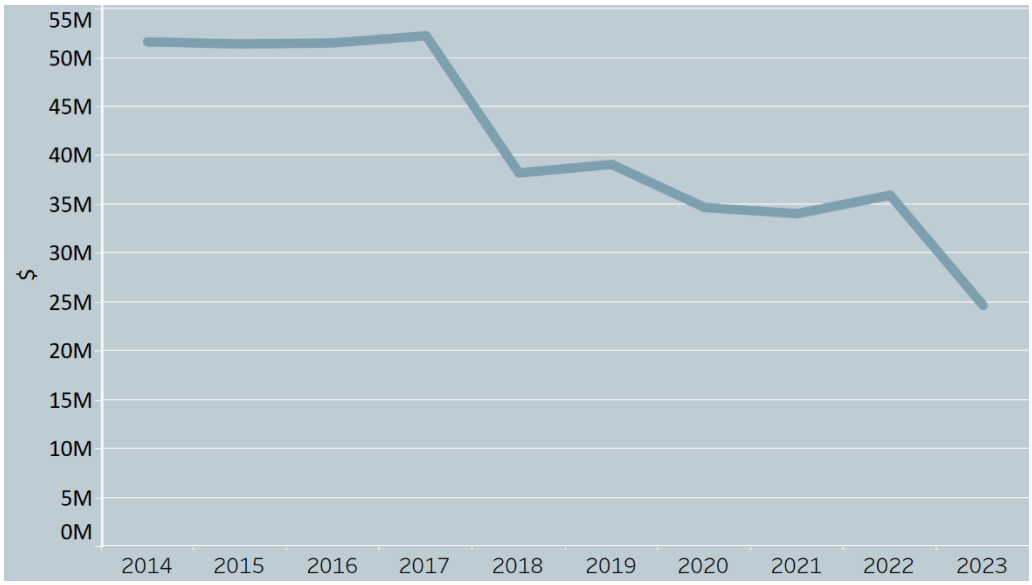
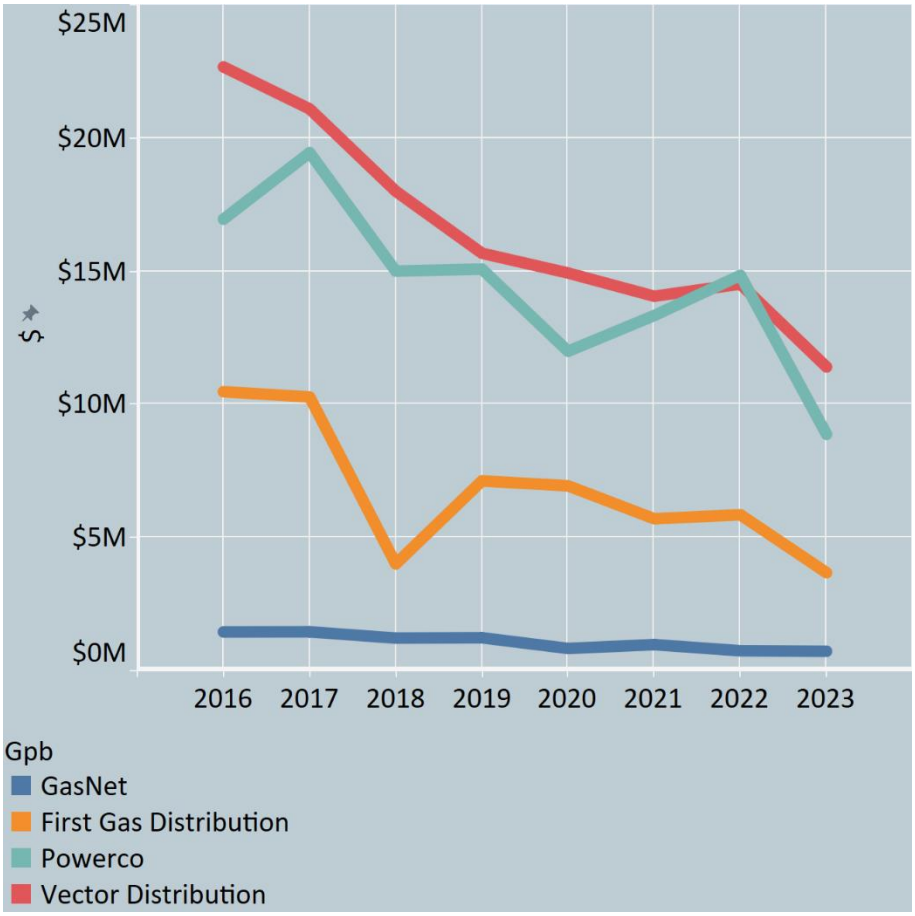


Figure 19: Cash profit trend for each local gas pipeline business, 2016-2023



80. Between 2014 to 2023, cash profits have decreased by $26.9 million or 7.1% per year on average. Cash profits have fallen for each of the local gas pipeline businesses by at least 47% since 2016. When we set the DPP, we estimate the WACC which determines our expectations of profit for each business, through the allowed rate of return on their regulated assets.[28] Profit and return on investment for local gas pipeline businesses is covered in more detail at the end of this chapter.

[28] 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, 2014-2023

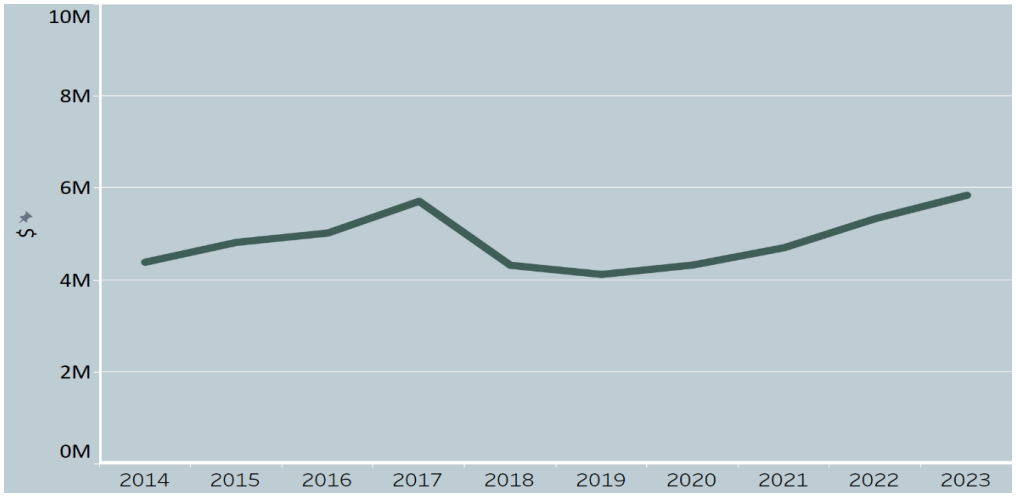
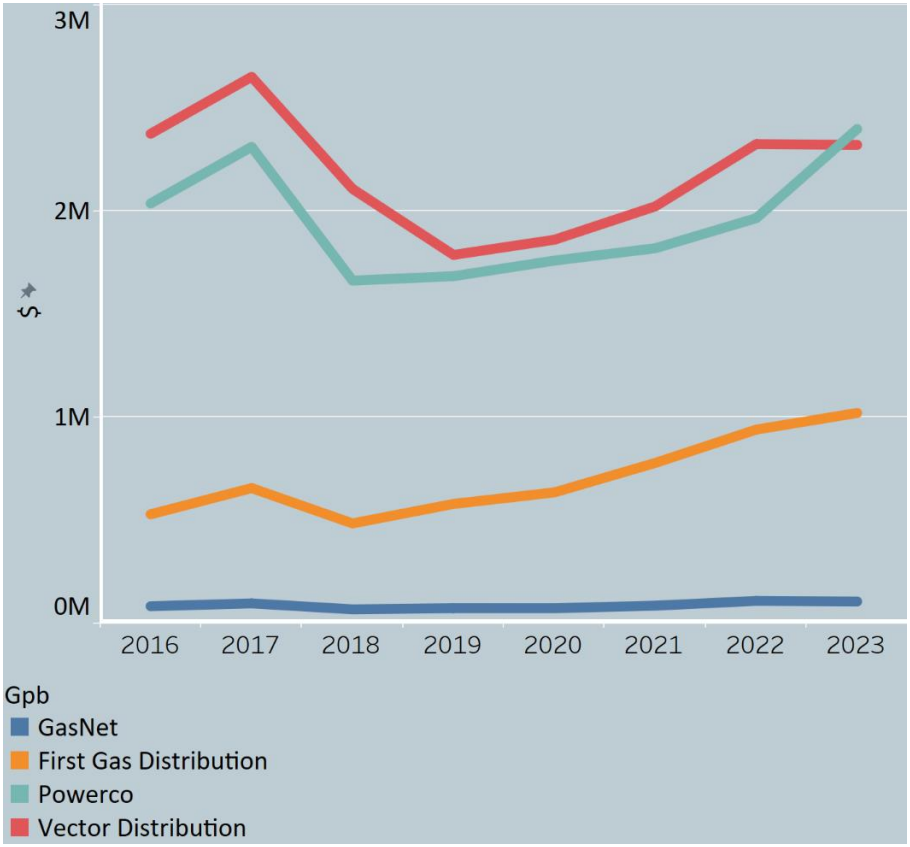


Figure 21: Pass-through and recoverable costs trend for each local gas pipeline business, 2016-2023



81. The pass-through component of local gas pipeline businesses' revenue does not include the costs associated with gas transmission pipelines, and thus forms a

comparatively small component of local gas pipeline businesses' revenue.[29] Gas transmission costs are not passed through to customers via local gas pipeline business, but by the gas retailer. Pass-through and recoverable charges increased from $4.4 million to $5.7 million between 2014 and 2017, before falling back to $4.3 million in 2018, remaining fairly steady between 2018 and 2020, and increasing up to $5.8 million in 2023. On average, pass-through and recoverable costs were approximately $19 per customer in nominal terms in 2023.

82. Pass-through and recoverable costs have decreased for Vector by 4.2% between 2016 to 2023. GasNet's pass-through and recoverable costs have remained flat, whilst Powerco's have increased by 20% over this period. FirstGas' pass-through and recoverable costs have risen by 100% 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 business opex increased at a greater rate than capex between 2014 and 2023

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

Figure 22: Total capex vs opex for all local gas pipeline businesses, 2014-2023

[29] 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.

84. As a proportion of total expenditure, local gas pipeline businesses collectively spend more on capex projects than opex. Total industry opex increased at a greater rate than capex between 2014 and 2023, with opex increasing by $15.3 million (46%), while capex increased by $10 million (24%).

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

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

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

    86.2 *Non-network assets* support local gas pipeline services but are not part of the network itself, e.g., vehicles and office equipment.

87. 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

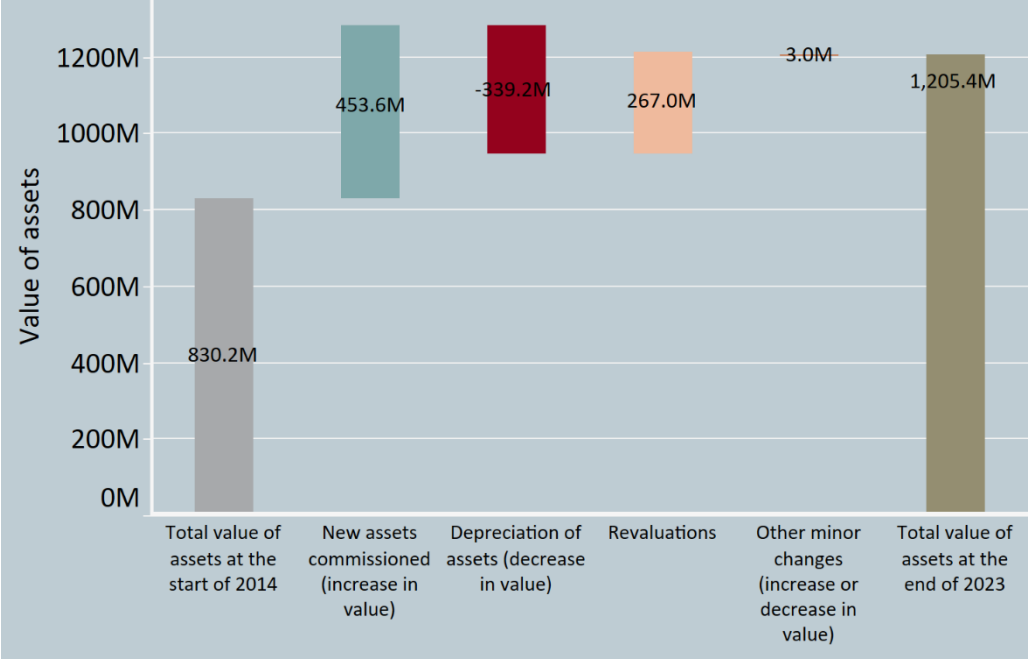
Category used	Capital expenditure category in ID	Capex type	Purpose of capex
Maintaining assets	Asset replacement and renewal	Network	To mitigate deterioration of assets or their surroundings, or address obsolescence of assets
	Reliability, safety and environment	Network	To improve the quality or safety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

	System growth	Network	To meet 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 $1.2 billion in 2023, an increase of $384 million since 2014

88. 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 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 2023.

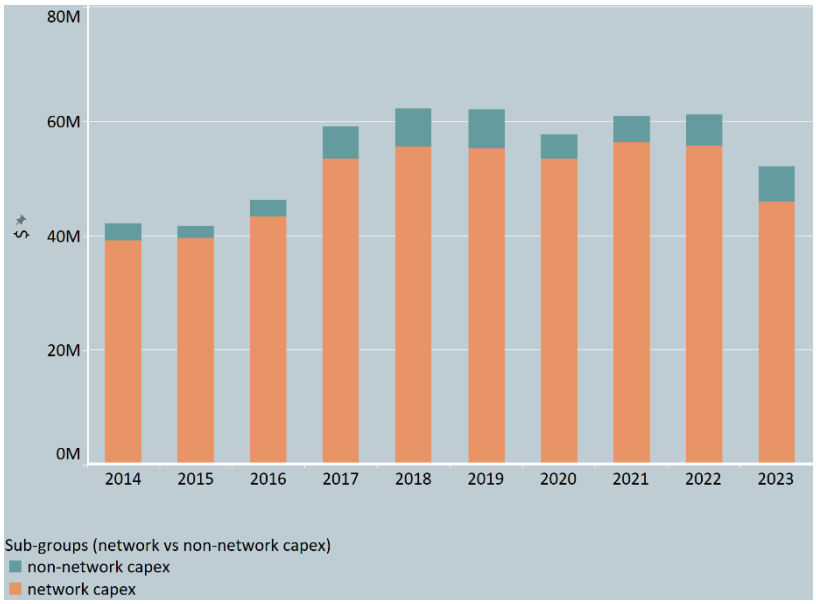
Figure 23: Waterfall chart of changes for RAB across all local gas pipeline businesses, 2014-2023



89. Newly commissioned assets are the most significant contributor to the change in value of the RAB, with an addition of $453.6 million since 2014. Depreciation has decreased the RAB by $339.2 million over the same period, while revaluation has lifted the RAB value by $267 million. In total, local gas pipeline businesses have a RAB valued at over $1.2 billion in 2023.

90. 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 2023.

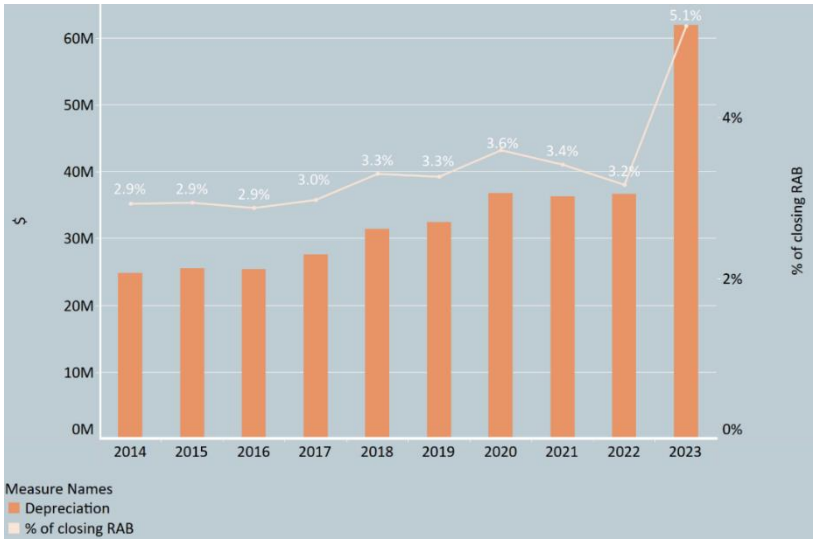
Figure 24: Split of network vs non-network capex for all local gas pipeline businesses, 2014-2023



91. Network capex has increased by $6.7 million or 17% between 2014 and 2023 but has been fairly consistent between 2017 and 2022. Investment in non-network assets has increased by $3.2 million or 107% since 2014, and has increased most between 2017 and 2019, with spend levelling off to just over $4 million in 2020 and 2021, before increasing up to $6.2 million in 2023.

Depreciation has been relatively stable over time until 2022, with a sharp spike in 2023

Figure 25: Total depreciation and as a percentage of RAB for all local gas pipeline businesses, 2014-2023



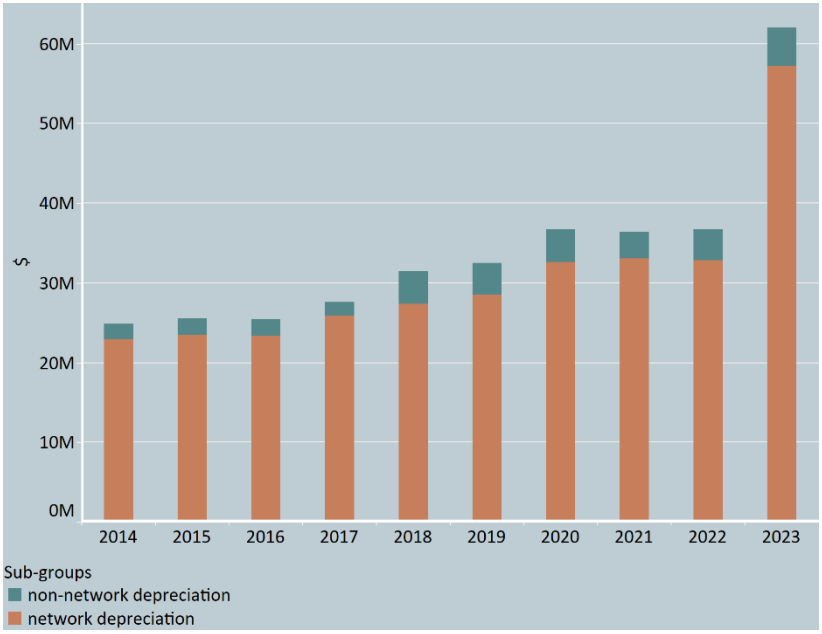
92. Total depreciation across all local gas pipeline businesses has increased from $25 million (2.9%) of the industry RAB in 2014, to $62 million (5.1%) of the industry RAB in 2023. An increase in commissioned capex ultimately flows through to the prices customers pay for the services of the local gas pipeline businesses, via increases in the value of the RAB and thus depreciation.[30] Increasing levels of capex (across network and non-network assets) have led to a steady increase in depreciation between 2014 and 2022, as shown in Figure 25.

93. The significant rise in depreciation in 2023 was due to shortened asset lives under DPP3. DPP3 was effective from October 2022. This was due to the expected decline in demand for gas in the long-term. Hence, there is a noticeable increase in the level of accelerated depreciation in 2023 after DPP3 came into effect.

94. Higher rates of inflation also drove up the value of the RAB due to revaluations of local gas pipeline businesses' regulated asset base. This is shown above in Figure 23.

95. 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 2023, while Figure 27 shows the proportion of network to non-network depreciation for each local gas pipeline business between 2016 and 2023.

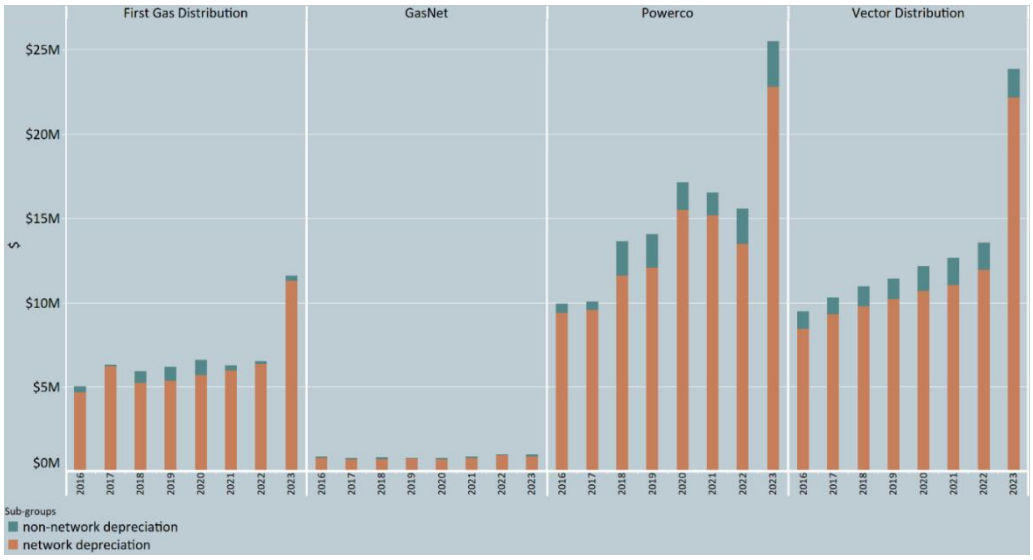
Figure 26: Split of network vs non-network depreciation for all local gas pipeline businesses, 2014-2023



[30] The RAB value, depreciation and opex allowances factors into the setting of the maximum allowable revenue of local gas pipeline businesses.

96. Network depreciation across all local gas pipeline businesses has increased by $34 million or 150% since 2014. Increases in non-network capex have led to an increase in non-network depreciation of $2.8 million or 140% since 2014. 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, 2016-2023



97. The network depreciation of Vector, Powerco and FirstGas have risen by $13.7 million (161%), $13.4 million (143%) and $6.6 million (140%), respectively, between 2016 and 2023. GasNet's network depreciation has remained relatively steady over the same period, increasing by $0.1 million (13%).

98. In 2023, the significant increase in the network depreciation of Vector, Powerco, and FirstGas can be attributed to shortened asset lives which led to accelerated depreciation under DPP3, effective from October 2022.

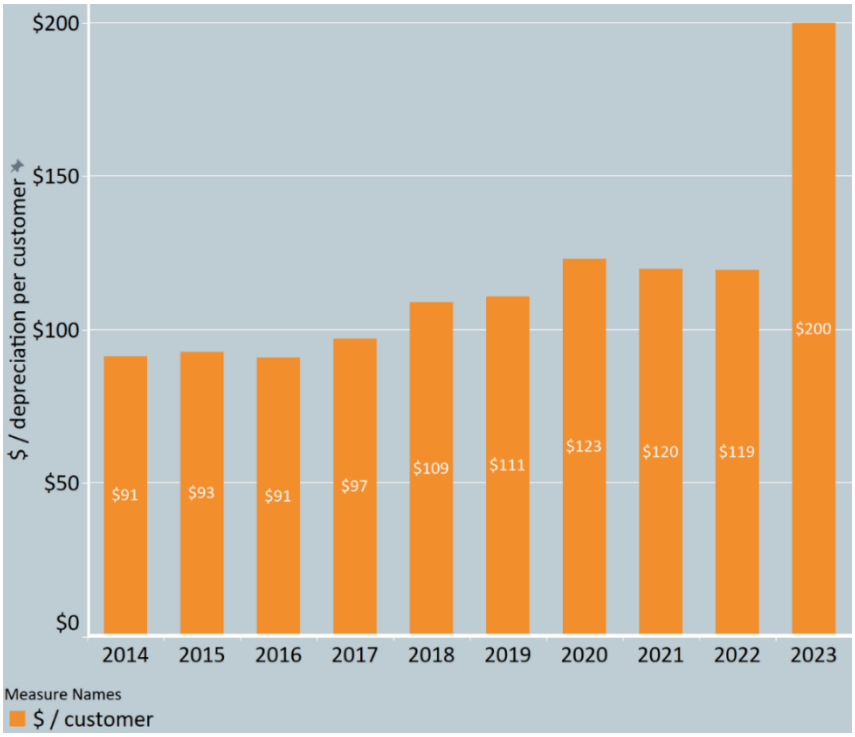
99. The increase in non-network depreciation seen at an industry level has also been driven by Powerco, which has seen its non-network depreciation increase by $2.2 million since 2016. Changes in non-network depreciation have been less for Vector, at $0.7 million, while FirstGas and GasNet's non-network depreciation has fluctuated to a lesser extent than Powerco and Vector.

Customers are each paying $109 more on average for depreciation in 2023, compared to 2014

100. All depreciation is ultimately reflected in the line charges paid by customers and has generally been growing on a per-connection basis from 2014 to 2023, where there was a large increase ($80 per customer) from 2021. Figure 28 shows the trend in

depreciation per customer across all local gas pipeline businesses between 2014 and 2023.

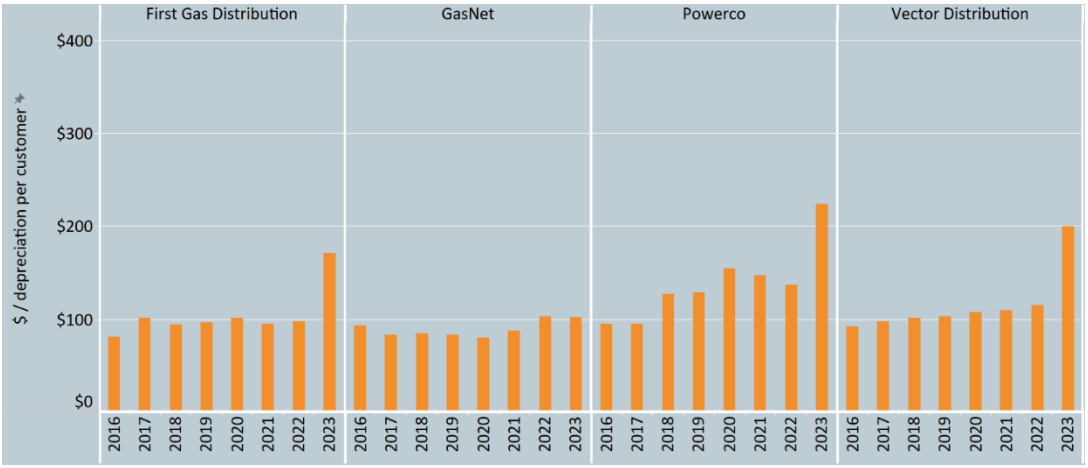
Figure 28: Depreciation per customer for all local gas pipeline businesses, 2014-2023



101. Depreciation increased by $109 per customer in nominal terms since 2014. A large proportion of that increase was the $81 per customer increase in the last year (2022-2023).

102. 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 2023.

Figure 29: Depreciation per customer for each local gas pipeline business, 2016-2023

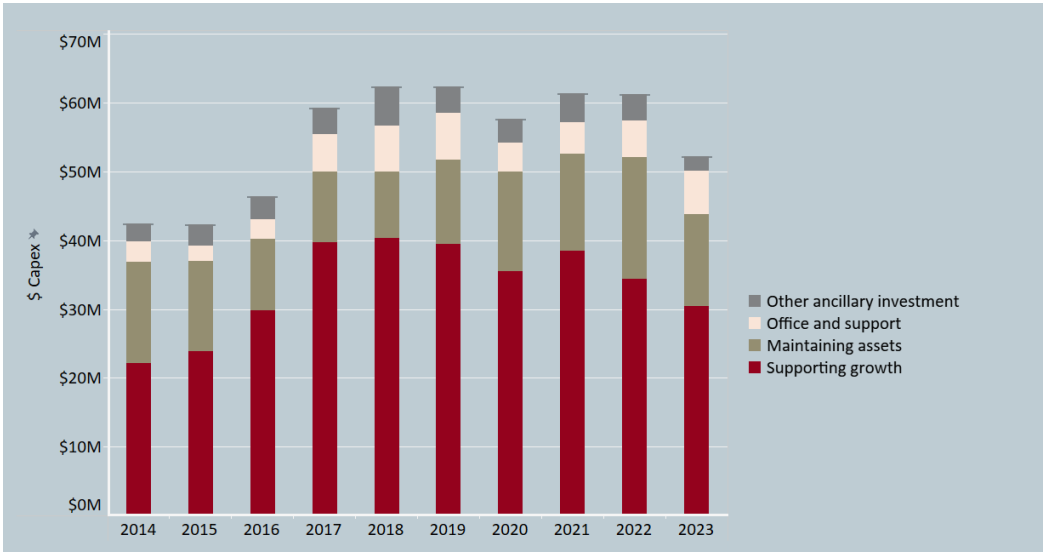


103. Depreciation per customer has risen significantly for FirstGas, Powerco, and Vector since 2016. Depreciation per customer increased at a much lesser rate for GasNet than the other three local gas pipeline businesses since 2016.

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

104. Local gas pipeline businesses' capex programmes have 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 2023.

Figure 30: Capex by high-level investment category for all local gas pipeline businesses, 2014-2023



105. Expenditure to support network growth includes 'customer 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 $334 million over the last ten years and increased by $8.4 million since 2014.

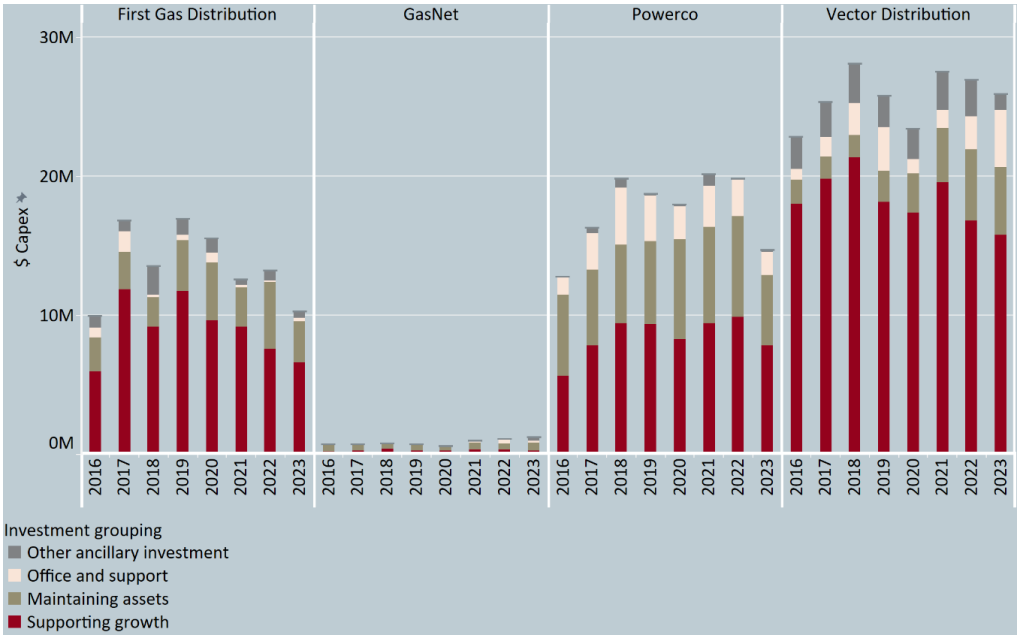
106. We limit the revenue of local gas pipeline businesses, but the WAPC allows them to earn more (or less) revenue depending on the extent to which actual demand is more (or less) than forecasted when the DPP is set. This has provided an indirect incentive for local gas pipeline businesses to grow the number of customer connections on their networks, allowing local gas pipeline businesses to thereby increase their total revenues and profits.[31] This is consistent with the growth in 'customer connection' and 'system growth' capex shown in Figure 32.

107. Expenditure to maintain assets is focussed on replacing or improving existing assets to ensure they remain reliable, safe and fit-for-purpose. Capex for maintaining assets includes expenditure for 'asset replacement and renewal', and 'reliability, safety and environment', which totalled $130 million over the last ten years, and decreased by $1.3 million since 2014.

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

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

Figure 31: Capex by high-level investment category for each local gas pipeline business, 2016-2023



109. Vector and Powerco have been responsible for most of the local gas pipeline investment since 2016. Vector's capex has also increased at the fastest rate since 2016, from $22.8 million by $3.1 million or 13.6%.

110. Vector spends most on supporting growth in its network, averaging $18.3 million per year since 2016. Vector also spent the most of all the local gas pipeline businesses in other ancillary investment since 2016. Powerco invests more than any other in maintaining assets, and office and support, investing an average of $3.2 million and $2.6 million per year respectively between 2016 and 2023.

Investment in new connections and system growth has been the main contributor of capital expenditure for local gas pipeline businesses since 2014

111. Demand growth and new customer connections can cause a need to reinforce parts of the network, which may require occasional periods of greater investment where assets are used by a large number of customers, classified 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 2023, while Figure 33 shows a breakdown of the investment in system growth across local gas pipeline businesses from 2014 to 2023.

Figure 32: Supporting growth capex for all local gas pipeline businesses, 2014-2023

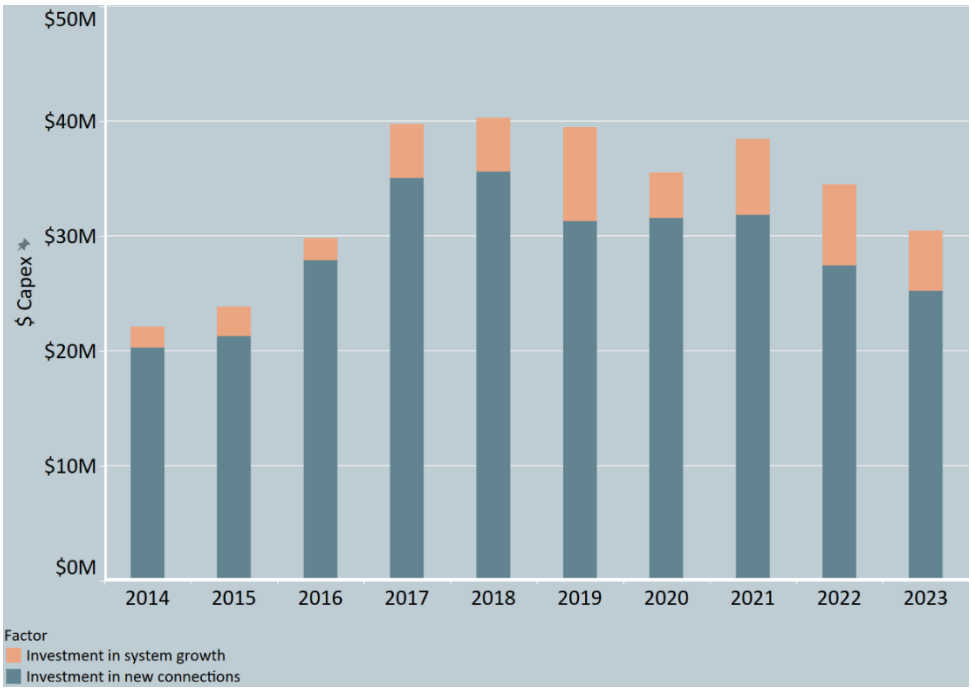
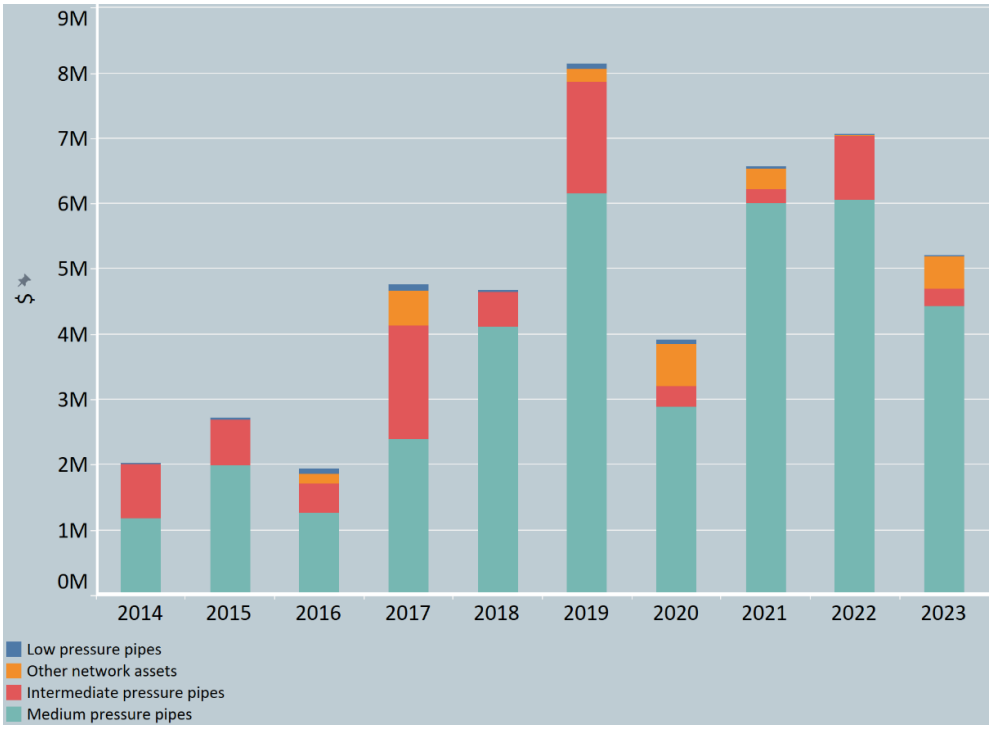


Figure 33: Breakdown of investment in system growth by all local gas pipeline businesses, 2014-2023



112. Investment in customer connections and system growth has grown by $4.9 million and $3.4 million 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 2022 onwards.

113. In the case of system growth, capex occurred across a range of asset types. The majority of system growth capex has been in medium-pressure pipelines, averaging $0.32 million per year since 2014, with a large portion occurring between 2017 and 2023.

114. 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: System growth and new connections capex for each local gas pipeline business, 2016-2023

115. Of the four local gas pipeline businesses, FirstGas Distribution invests the most in system growth capex, spending $19.9 million in total between 2016 to 2023. FirstGas' investment in system growth capex reached a high of $5.8 million in 2019, then decreased between 2020 and 2023.

116. In terms of investment in new connections, Vector invested the most, spending $123.6 million in total between 2016 and 2023. Vector spent between$15 million to $20 million each year during this period on new connections.

117. Powerco spent the second highest amount of money on supporting system growth and new connections, totalling $13.1 million and $54.4 million respectively, between 2016 and 2023.

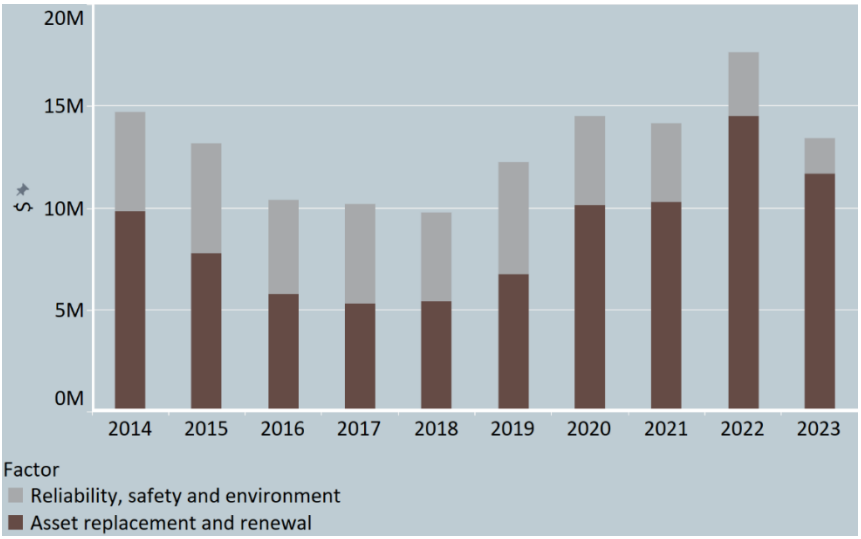
Figure 35: Breakdown of investment in system growth by each local gas pipeline business, 2016-2023

118. For investment in system growth, specifically Powerco, FirstGas and Vector have been investing consistently in medium-pressure pipeline assets. FirstGas has also had some notable intermediate-pressure pipeline investment in 2017, 2019 and 2021. FirstGas' 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 also increased in 2021, attributable to medium pressure pipe capex. Powerco's investment in system growth spiked in 2022 due to the volume of customer connections exceeding expectations, creating a 74.6% increase in this category in the 2022 disclosure year, compared to the 2021 disclosure year.

Investment in maintaining assets has generally been consistent over time

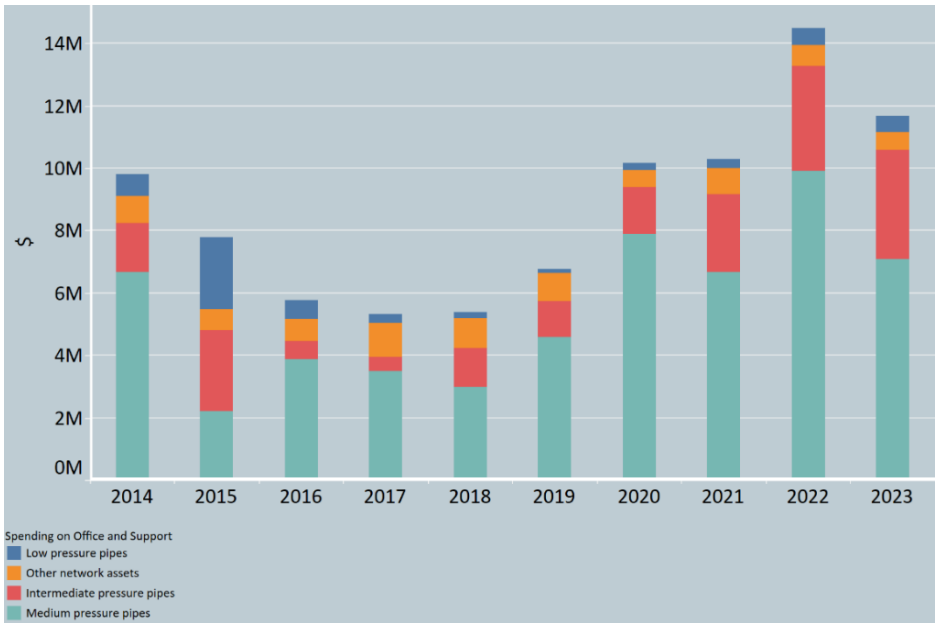
119. Collectively, local gas pipeline businesses have invested approximately $10 million to $15 million each year on maintaining their assets. Figure 36 shows the trend of expenditure in maintaining assets for all local gas pipeline business from 2014 to 2023.

Figure 36: Maintaining assets capex for all local gas pipeline businesses, 2014-2023



120. The total investment in maintaining assets dropped slightly between 2016 and 2018, before rising in 2019, and reaching a high of $17.7 million in 2022, then dropping off to $13.4 million in 2023. Between 2020 and 2023, asset replacement and renewal capex accounted for a larger proportion of asset maintenance capex, than capex on reliability, safety and environment. Asset replacement and renewal capex has increased by $1.8 million or 18.7% between 2014 and 2023. Reliability, safety and environment capex has decreased by $3.1 million or 64.4% over the same period. 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.

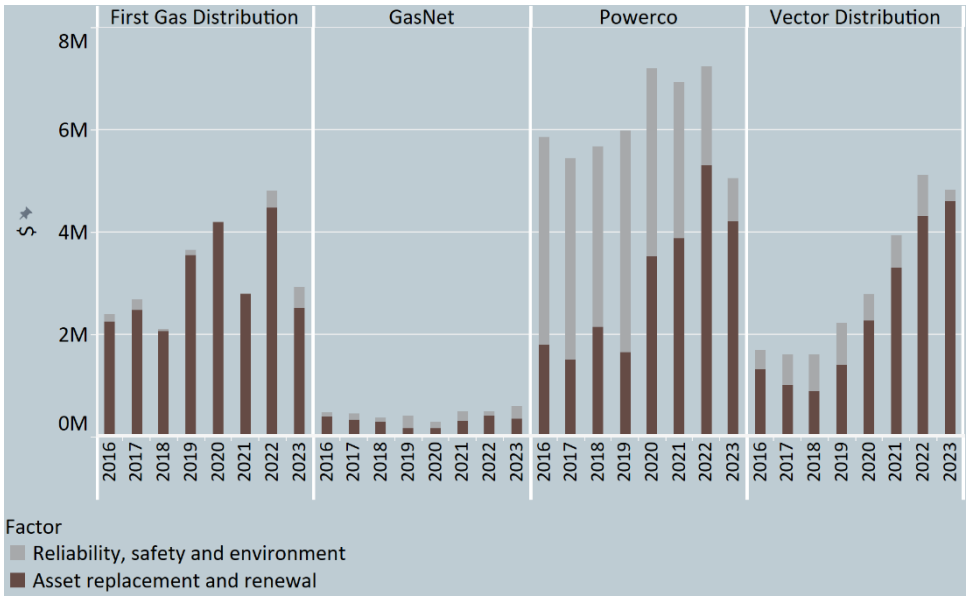
Figure 37: Breakdown of investment in asset replacement and renewal capex by all local gas pipeline businesses, 2014-2023



121. Asset replacement and renewal capex is mostly on medium-pressure pipeline assets, but the amount has fluctuated over time. Since 2014, between $2.2 million and $9.9 million has been invested in medium-pressure pipeline asset replacement and renewal per year. Intermediate-pressure pipelines is the next-largest component, with $0.5 million to $3.5 million invested per year over the same period.

122. 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, 2016-2023



123. Figure 38 shows that Powerco is spending the most of all the local gas pipeline businesses to maintain assets, at an average of $6.2 million per year between 2016 and 2023, followed by FirstGas which averaged $3.2 million per year between 2016 and 2023. Capex on maintaining assets has been increasing between 2016 and 2023 for FirstGas by $0.5 million (2.4% per year), Vector by $3.1 million (13.9% per year), and GasNet by $0.1 million (2.3% per year). Asset maintenance capex has decreased for Powerco by $0.9 million (-2.0% per year).

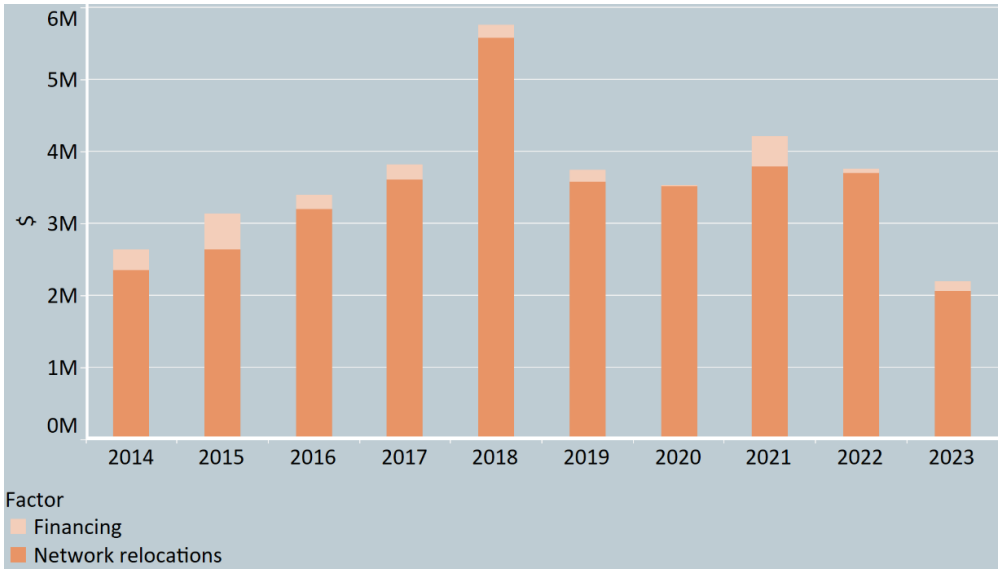
Figure 39: Asset replacement and renewal capex for each local gas pipeline business, 2016-2023

124. The gradual increases of medium-pressure asset renewal and replacement capex seen at the industry level in recent years, are attributable to FirstGas, Powerco, and Vector. Vector's asset renewal and replacement capex has mostly been spent on medium-pressure and intermediate pressure pipelines since 2016, with an increasing focus on intermediate-pressure pipelines since 2019. GasNet's asset replacement and renewal expenditure has been mainly targeted at low-pressure pipelines, as these form the majority of its pipeline system. FirstGas' capex on asset replacement and renewal increased significantly in 2022 when compared with 2021, with delays due to worldwide logistical and supply chain issues at that time. Powerco's capex for asset replacement and renewal in 2022 increased significantly by 28.2% compared to the previous year. This increased spending was largely due to increased costs pressures, due to inflation and construction costs, and reclassifying the financial treatment of riser replacement from opex to capex. Vector's asset replacement and renewal capex increased significantly as well in 2022 and 2023, with Cyclone Gabrielle pushing costs up in this area by 24%.

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

125. Changes to other ancillary investment have been driven primarily by network relocation. Figure 40 shows the trend in other ancillary investment, between 2014 and 2023.

Figure 40: Other ancillary investment across all local gas pipeline businesses, 2014-2023



126. Network relocation capex decreased by $0.3 million between 2014 and 2023, having peaked in 2018, and decreasing since then. Capitalised financing costs is the smallest of all capex categories, averaging $22,000 per year between 2014 and 2023.

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

127. While network relocation is a relatively small portion of overall capex spend, it is a component of capex with a high degree of customer visibility, as relocation costs are often offset to a degree by capital contributions from the customers who sought the 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 2023.

Figure 41: Purpose of capital contributions across all local gas pipeline businesses, 2014-2023

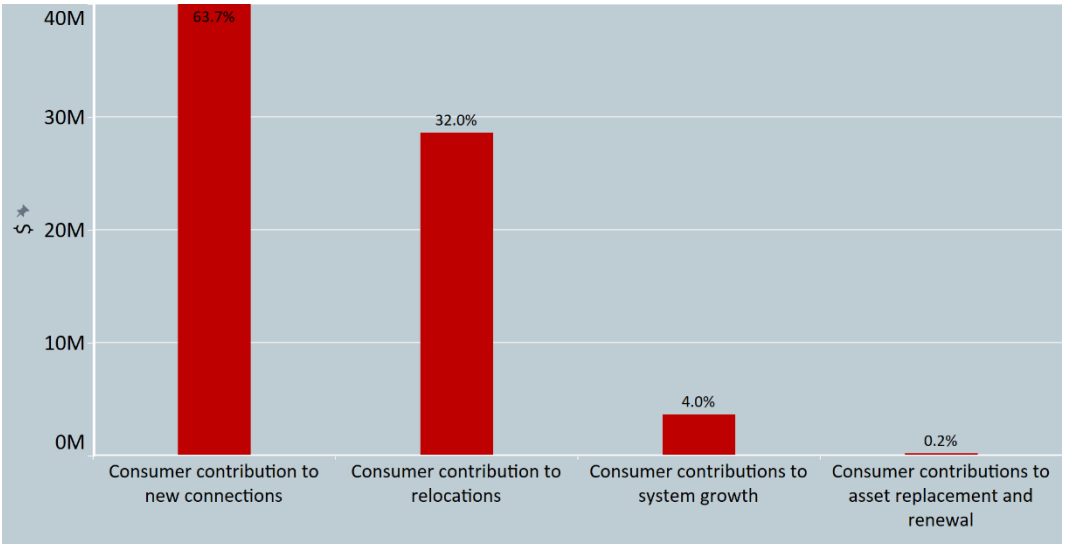
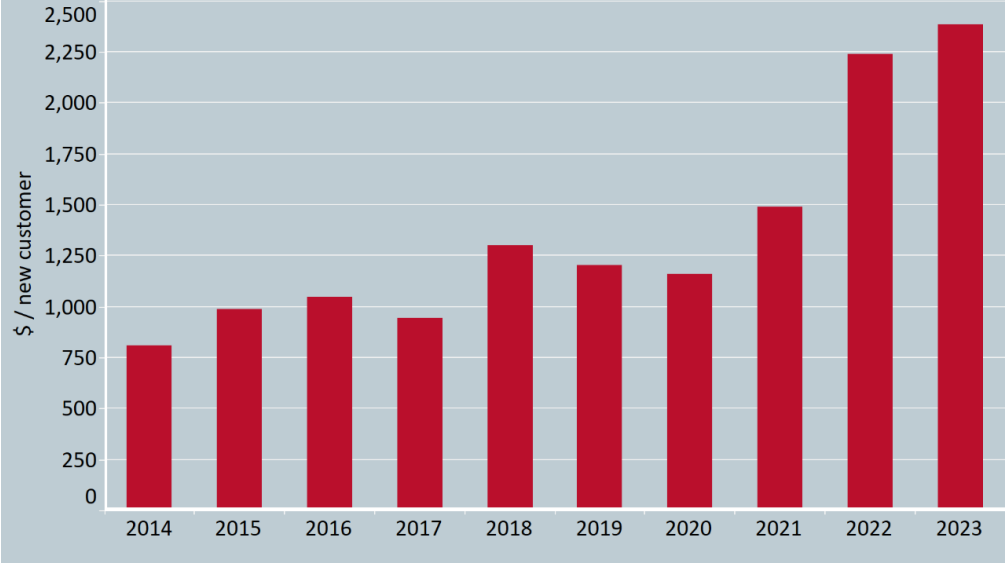


Figure 42: Capital contributions per new customer for all local gas pipeline businesses, 2014-2023



128. Capital contributions over the last ten years have been made primarily for new connections and network relocations. On a per new customer basis, capital contributions have increased by $1,572 (in nominal terms) or by 194%. Capital contributions per new customer increased significantly in 2022 and 2023, compared with previous years. Figures 43 and 44 show the proportion of new connection and relocation capex that has been funded through capital contributions between 2014 and 2023. Investment in new connections are shown in the narrow red bars on each graph, while the wider, teal-coloured bars show the customer contributions to new connections.

Figure 43: Proportion of new connection capex funded by capital contributions across all local gas pipeline businesses, 2014-2023

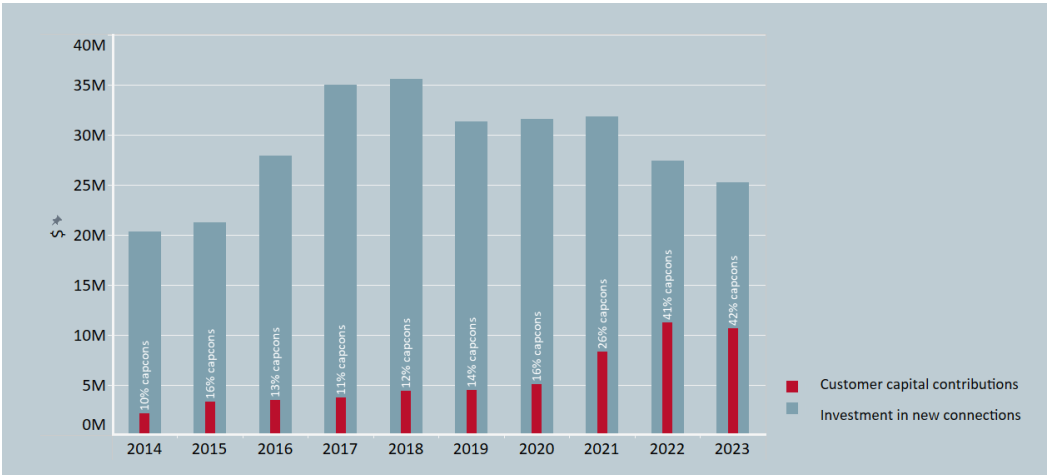
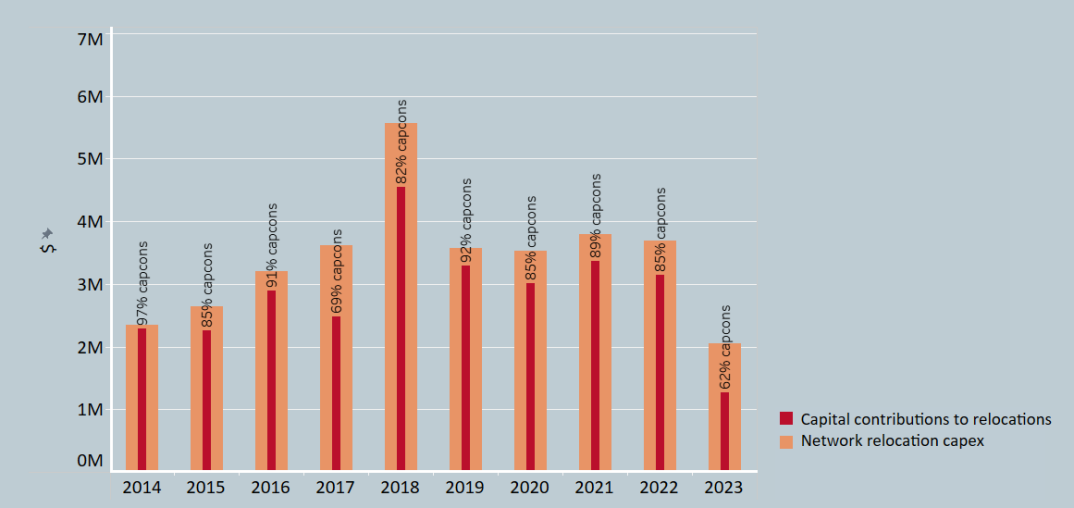


Figure 44: Proportion of network relocation capex funded by capital contributions across all local gas pipeline businesses, 2014-2023



129. While the majority of network relocation expenditure is recovered through capital contributions by customers, the capital cost of new connections is mostly borne across the customer base of local gas pipeline businesses i.e., 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 businesses' revenue.

130. The extent to which new customers contribute to connections or relocations varies across local gas pipeline business depending on their capital contribution policies. Since 2017, Vector, which has the highest investment in new connection, has changed its capital contribution policy to recover increasing amounts of new connection capex costs from its customers. The proportion of capital contributions to new connections has increased gradually from 2018 onwards, with sharp increases in 2022 and 2023 compared to previous years. From July 2021, Vector made further changes to its capital contribution policy to require a 100% contribution from connecting customers for new connections.

The cost of running all local gas pipeline businesses has reached close to $50 million in 2023

131. Around 42% of local gas pipeline businesses' revenue between 2014 and 2023, averaging $39.5 million per year, was used for operating expenditure, to operate their networks on a day-to-day basis. In 2023, the cost of running local gas pipeline businesses increased collectively by $15.3 million since 2014, to $48.6 million.

132. 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.

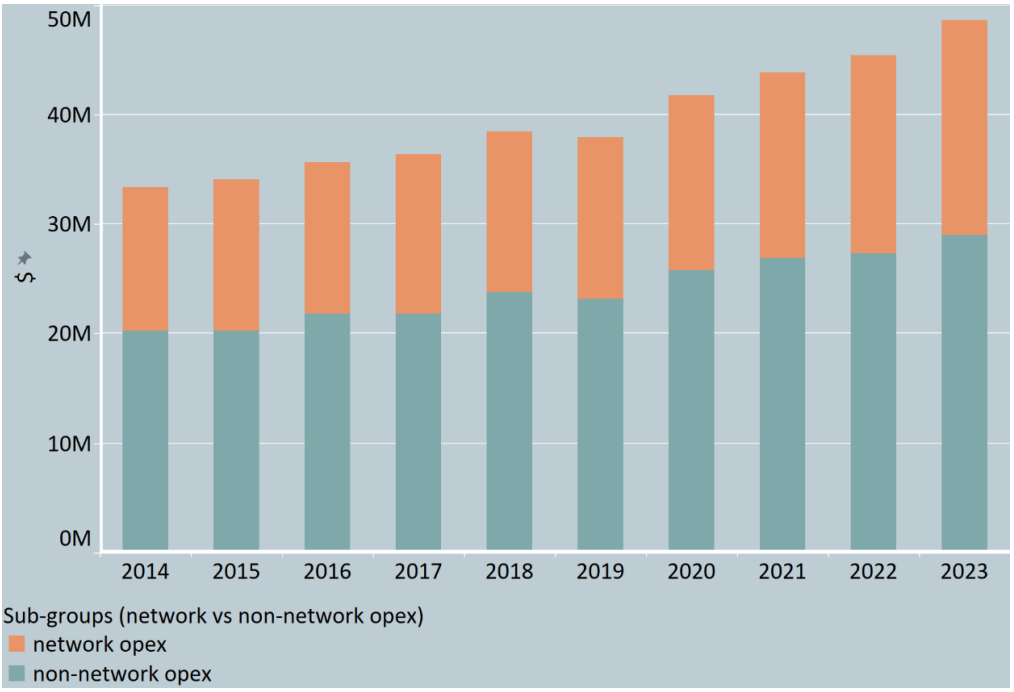
Table 4: Mapping of categories and purpose of opex

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, e.g., 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, e.g., 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

133. 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 2023.

Figure 45: Split of network vs non-network opex for all local gas pipeline businesses, 2014-2023



134. Network opex has increased by approximately $0.67 million or 4.2% on average per year since 2014 to 2023. Non-network opex has grown by closer to $0.87 million or 3.6% 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 2.7% per year between 2014 and 2023.[32]

135. Non-network opex is composed of 'system operations and network support' spending, and 'business support' costs, which formed 22% and 38% of total opex respectively between 2014 and 2023. Figures 46 and 47 show opex by expenditure category and the trend of each between 2014 and 2023.

[32] Stats NZ Infoshare, CPI Level 3 Classes for New Zealand, (viewed on 1 November 2024).

Figure 46: Opex by expenditure category for all local gas pipeline businesses, 2014-2023

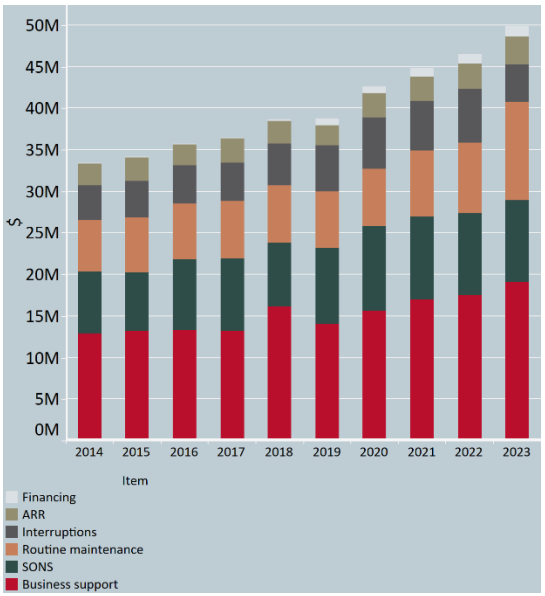
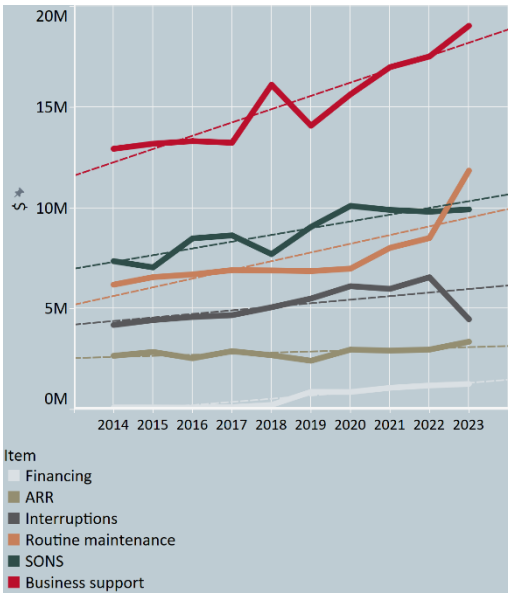


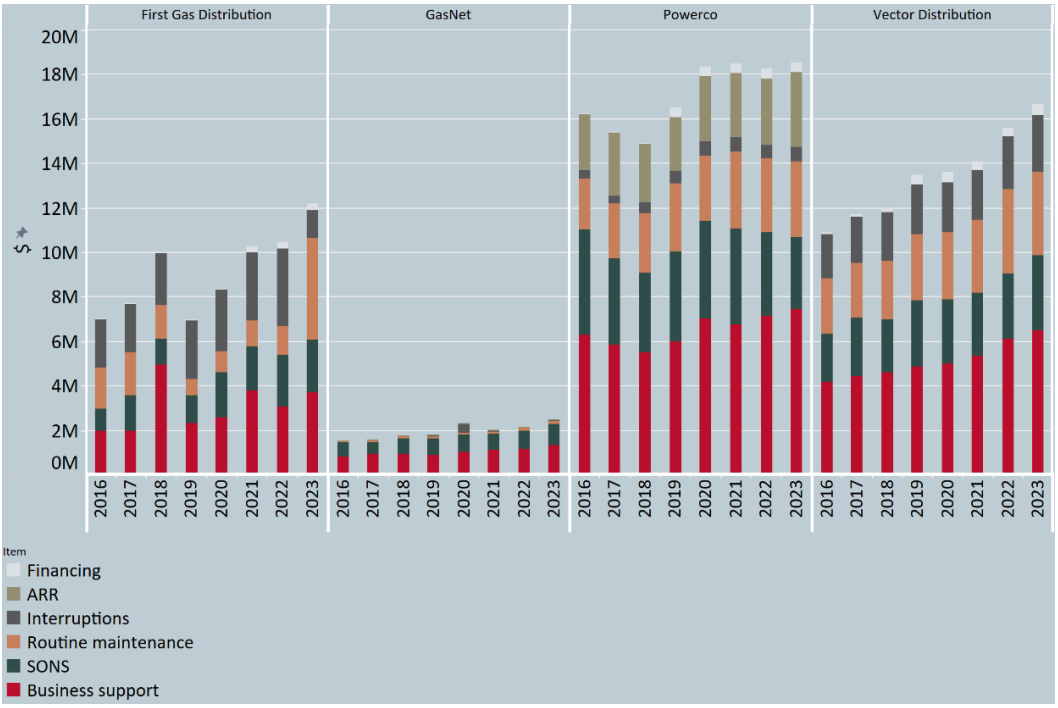
Figure 47: Trends in opex categories for all local gas pipeline businesses, 2014-2023



136. 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, routine maintenance, and system operations and network support, and interruptions opex, have been increasing the most each year, at $0.61 million (3.9% per year on average), $0.56 million (6.6% per year on average) and $0.3 million (3.0% per year on average) 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.

137. 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 2023.

Figure 48: Opex by expenditure category for each local gas pipeline business, 2016-2023

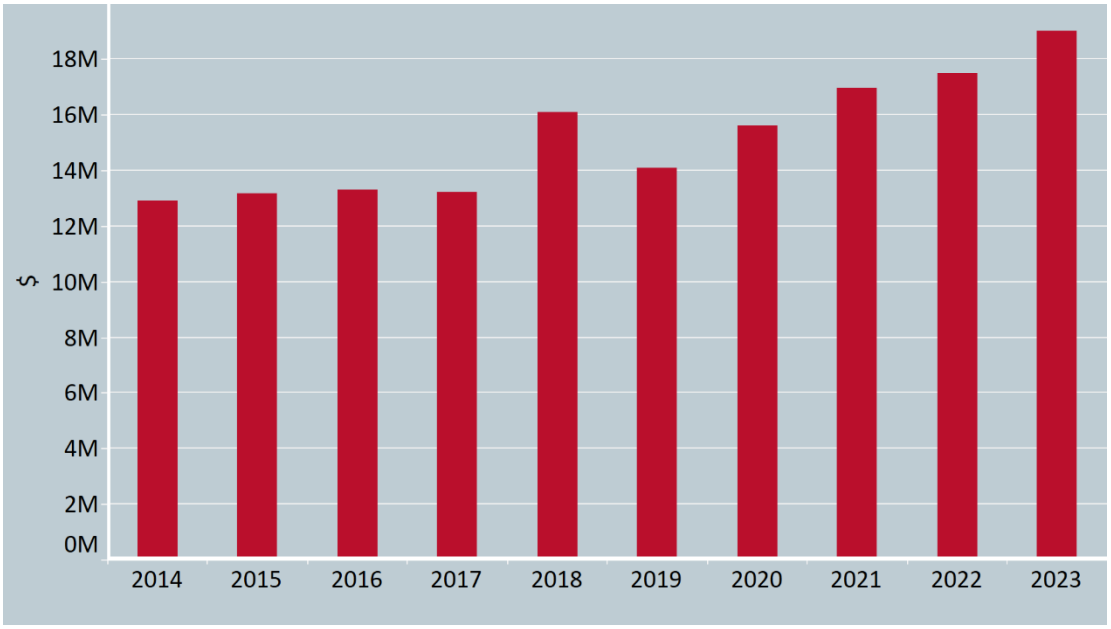


138. Powerco spent the most of all local gas pipeline businesses on its day-to-day operations, averaging $17 million per year between 2016 and 2023. This opex is mostly on non-network activities: business support, and system operations and network support, which have averaged $6.5 million and $4 million per year, on average, over this period. FirstGas and GasNet have seen the most growth in opex since 2016, increasing by 7.2% per year and 6.1% per year on average, respectively. Powerco is the only local gas pipeline business that spends on asset replacement and renewal opex activities, likely due to how each local gas pipeline business chooses to categorise the opex within the disclosures themselves.

Local gas pipeline businesses collectively have spent $5.8 million or 30.5% more on business support activities since 2014

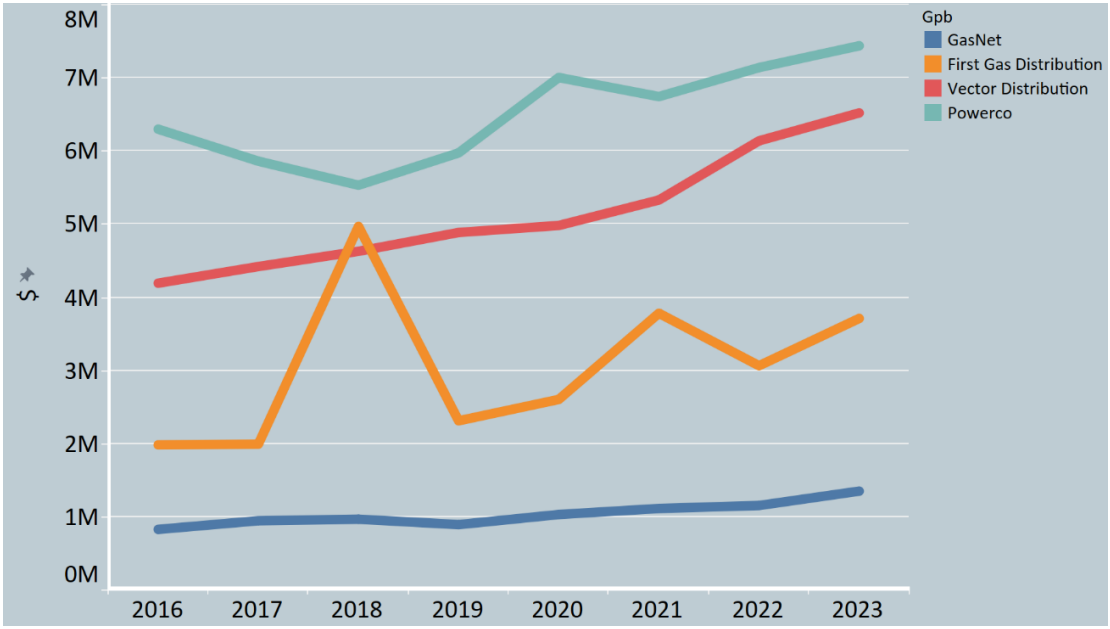
139. Business support costs are the largest component of opex across all local gas pipeline businesses. Figure 49 show business support opex across all local gas pipeline businesses between 2014 and 2023. Figure 50 show business support opex for each local gas pipeline business between 2016 and 2023.

Figure 49: Business support opex for all local gas pipeline businesses, 2014-2023



140. Business support costs across local gas pipeline businesses have grown by $5.8 million, or 30.5%, since 2014. At an industry level, business support opex demonstrates an increasing trend over time from 2014 to 2023.

Figure 50: Business support opex for each local gas pipeline business, 2016-2023



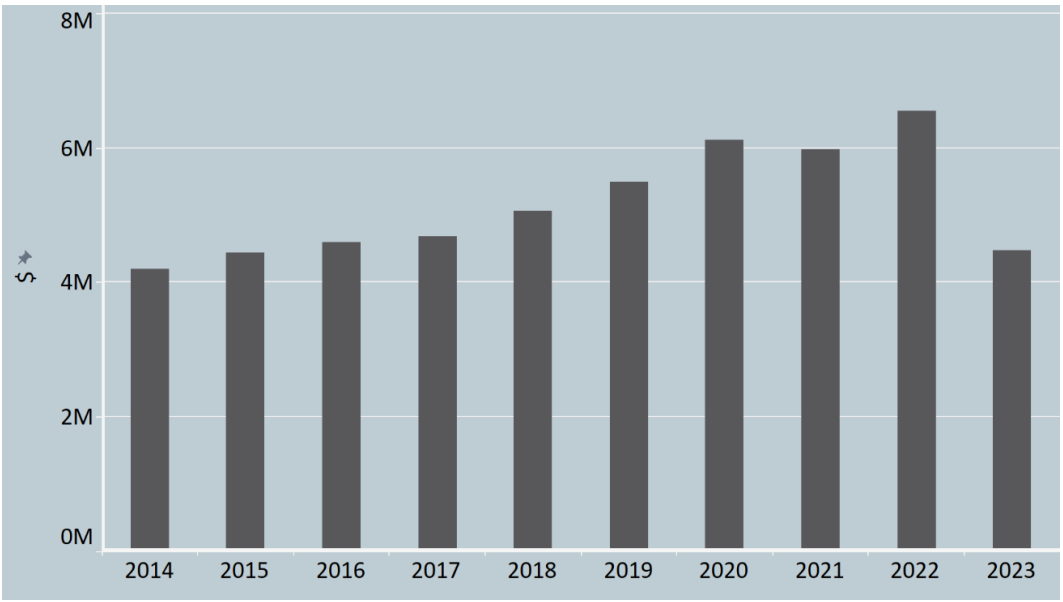
141. Vector and FirstGas bear the largest increase in business support opex, and both businesses have seen increases of $2.3 million and $1.7 million respectively since 2016. Vector and GasNet have seen steady rises, but FirstGas and Powerco have

noticeably different and fluctuating trends. 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 responding to interruptions and emergencies on local gas pipelines have generally increased since 2014

142. 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 2023, and for each local gas pipeline businesses between 2016 and 2023 respectively.

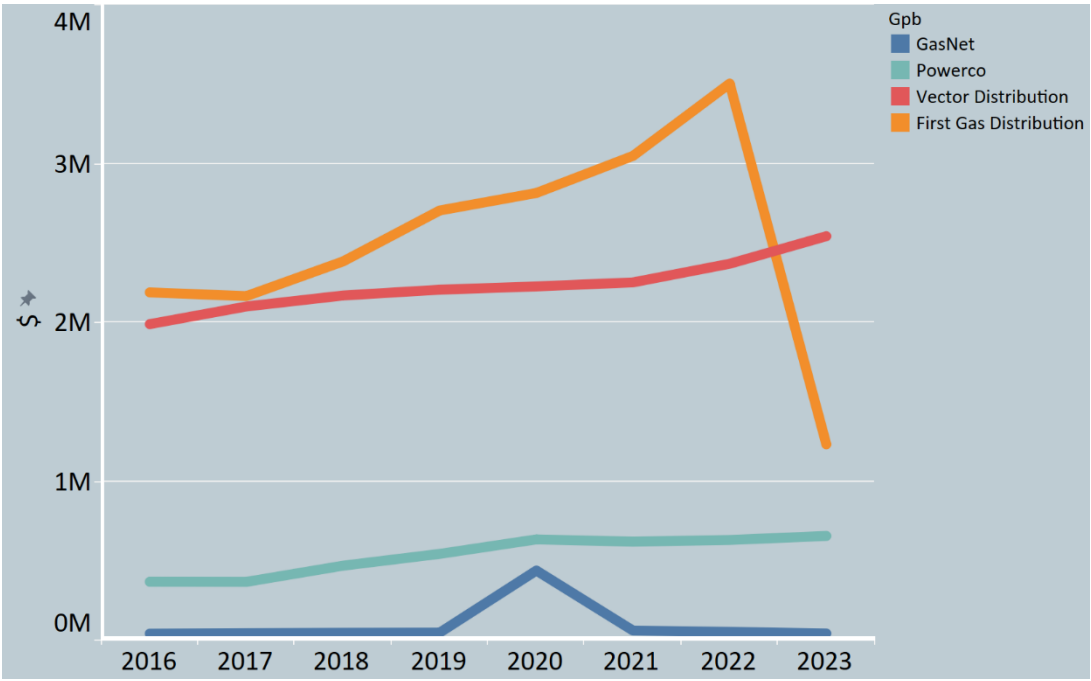
Figure 51: Service interruptions, incidents and emergencies opex for all local gas pipeline businesses, 2014-2023



143. Interruptions opex across all local gas pipeline businesses has increased by $0.28 million in absolute terms or 6.8% since 2014.[33]

[33] 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, 2016-2023



144. Vector has seen the largest increase in interruptions opex (in absolute terms), of $0.55 million or 27.8% since 2016. In percentage terms, Powerco had the largest increase in interruptions opex of 78.5% or $0.29 million since 2016. FirstGas' interruptions opex decreased by 43.7% or $0.96 million, due to a sharp drop in 2023 in the number of interruptions (286) compared with 340 interruptions in 2022. The 2020 spike in GasNet's interruptions opex occurred as the result of a water leak interrupting customer supply in early 2020, but overall GasNet has the lowest increase in their interruptions since 2014 at $1,000.

Local gas pipelines' quality of service has generally been improving

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

145.1 the total number of interruptions occurred;

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

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

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

147. We also collect information relating to the number of emergencies experienced on local gas pipeline networks, 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, apart from gas leaks, have all been generally trending downward since 2014.

148. While our analysis suggests overall industry quality outcomes are not worsening, we have noticed some local gas pipeline businesses' network integrity and reliability outcomes may need to be looked at more closely. In the future, we will investigate whether new quality metrics or enhanced reporting is appropriate, given gas network investment strategies may change, due to opex and asset renewals solutions being preferred over asset replacements. Our goal is to ensure gas networks remain safe and reliable.

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

149. Interruptions on local gas pipeline networks can be broken down by source. Figures 53 and 54 show the breakdown of interruptions by origin across all local gas pipeline businesses between 2014 and 2023, and the breakdown of interruptions by origin for each local gas pipeline business between 2016 and 2023.

Figure 53: Breakdown of interruptions by origin across all local gas pipeline businesses, 2014-2023

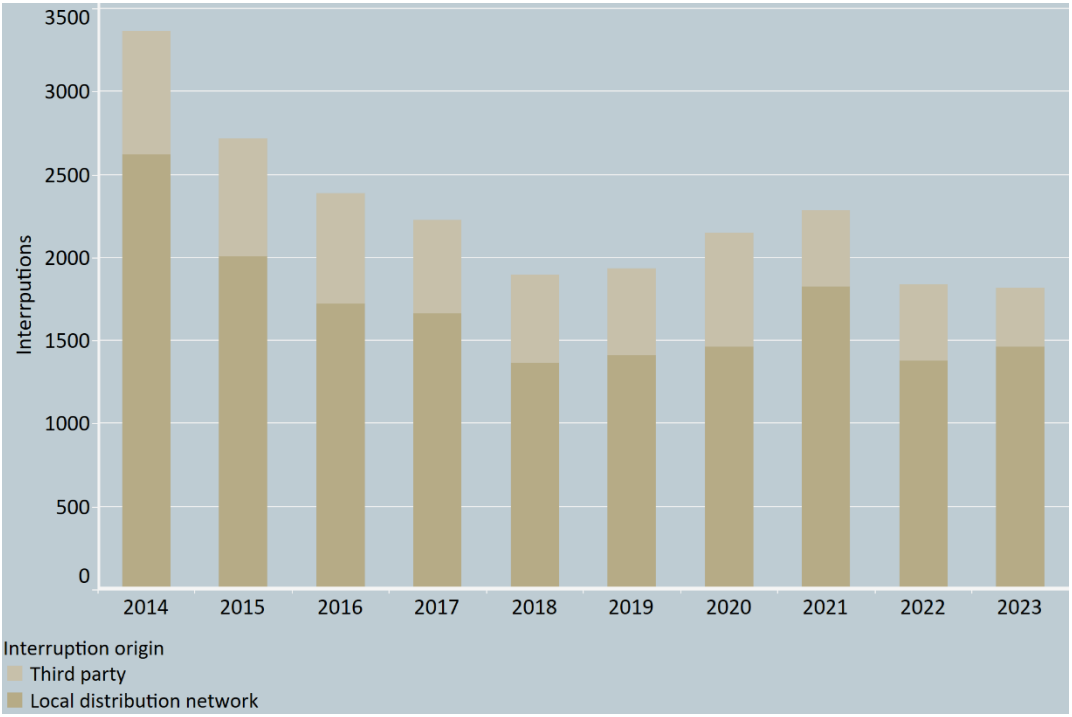
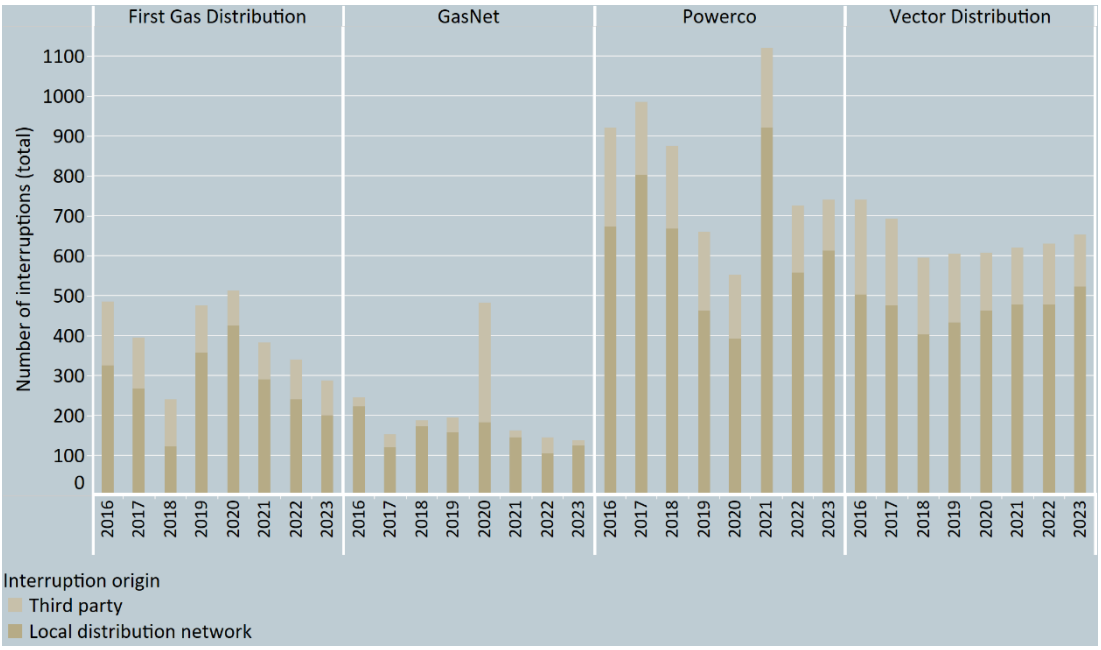


Figure 54: Breakdown of interruptions by origin for each local gas pipeline business, 2016-2023



150. Local gas pipeline businesses are the predominant source of interruptions (true for all years and all local gas pipeline businesses, except for GasNet in 2020). Local gas pipeline businesses accounted for around three-quarters of interruptions between

2014 and 2023, while third parties accounted for the remaining one-quarter of interruptions during this period. Interruptions caused by the transmission network have not occurred at all since 2014. Overall, the number of interruptions has generally trended down over time since 2014.

151. Powerco had the most interruptions over the last eight years. Powerco's 2021 increase was due to planned interruptions for replacement works of pre-1985 pipes in the Hutt Valley and Porirua region.

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

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

Figure 55: Average number of emergencies across local gas pipeline businesses, 2014-2023

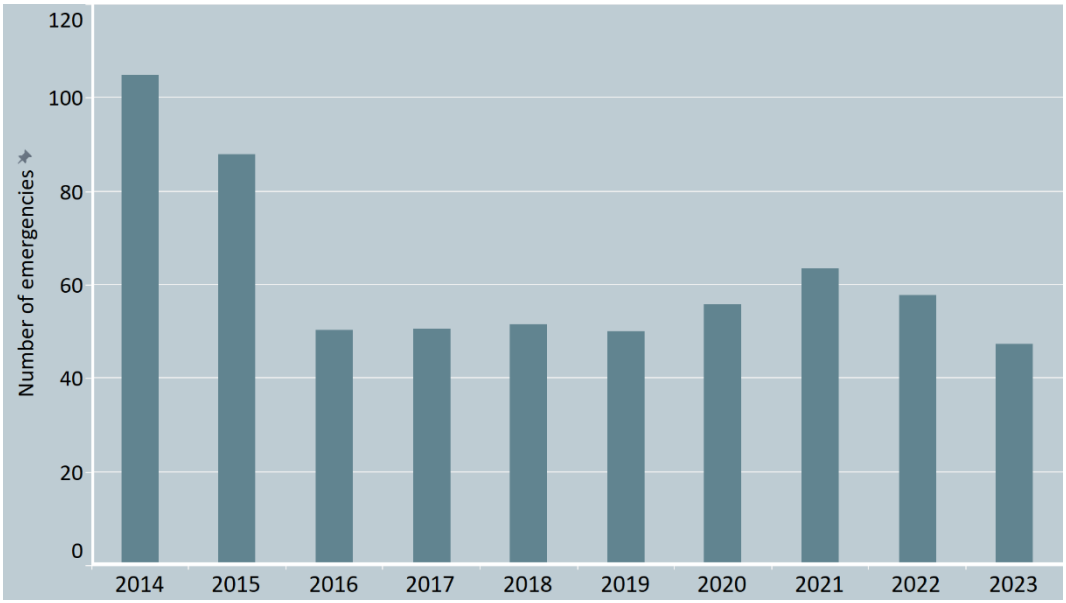
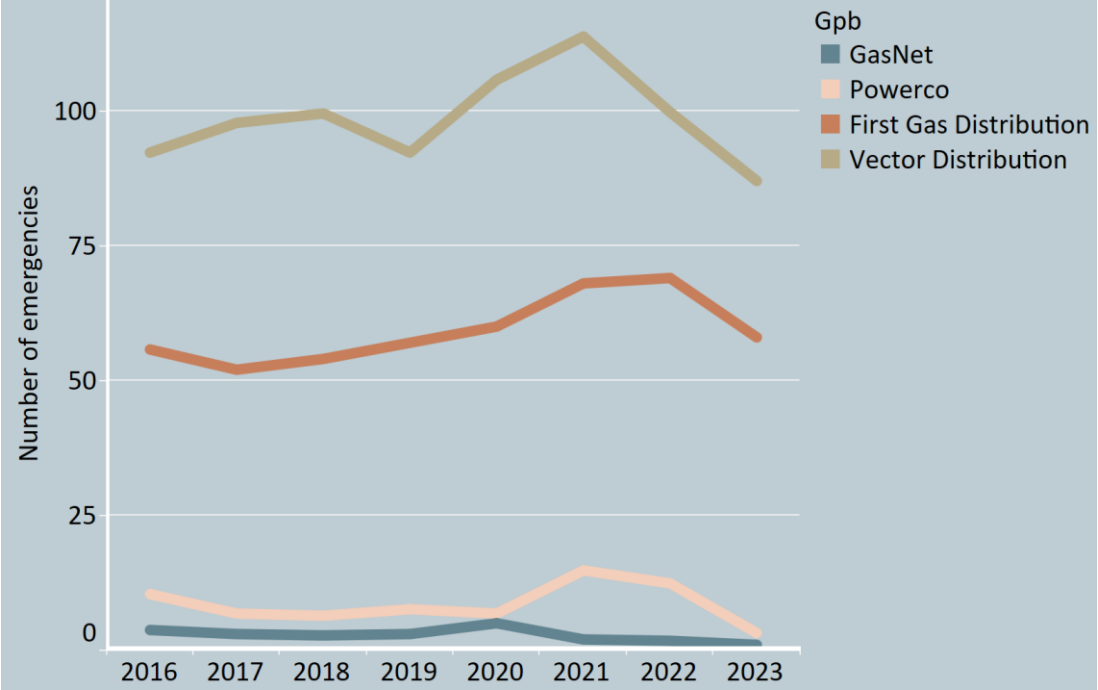


Figure 56: Average number of emergencies for each local gas pipeline business, 2016-2023



153. The number of emergencies across local gas pipeline businesses fell by 55% between 2014 and 2023. Between 2016 and 2021, the number of emergencies on Vector's network has generally been trending up, spiking in 2021, before tapering off in 2022 and 2023. Emergencies relate to active involvement of emergency services (e.g., fire service, ambulance), with the interruption to more than five customers, or evacuation of premises. Therefore, network emergencies are generally more likely to occur on Vector's network because it is the most customer-dense of all the local gas pipeline businesses. The number of emergencies of FirstGas has also been trending up between 2016 and 2022, before decreasing in 2023. Powerco's number of emergencies has trended down from 2016 to 2020, followed by a moderate spike in 2021, before dropping off in 2022 and 2023. GasNet's number of emergencies have been relatively flat between 2016 and 2023.

154. Local gas pipeline businesses also disclose the average number of complaints per customer on their networks. Figure 57 shows the trend over time across all local gas pipeline businesses between 2014 and 2023, while Figure 58 shows the trend over time for each local gas pipeline business between 2016 and 2023. As the frequency of complaints per customer is small, this metric is given in terms of complaints per 1,000 customers.

Figure 57: Average number of complaints per 1,000 customers across all local gas pipeline businesses, 2014-2023

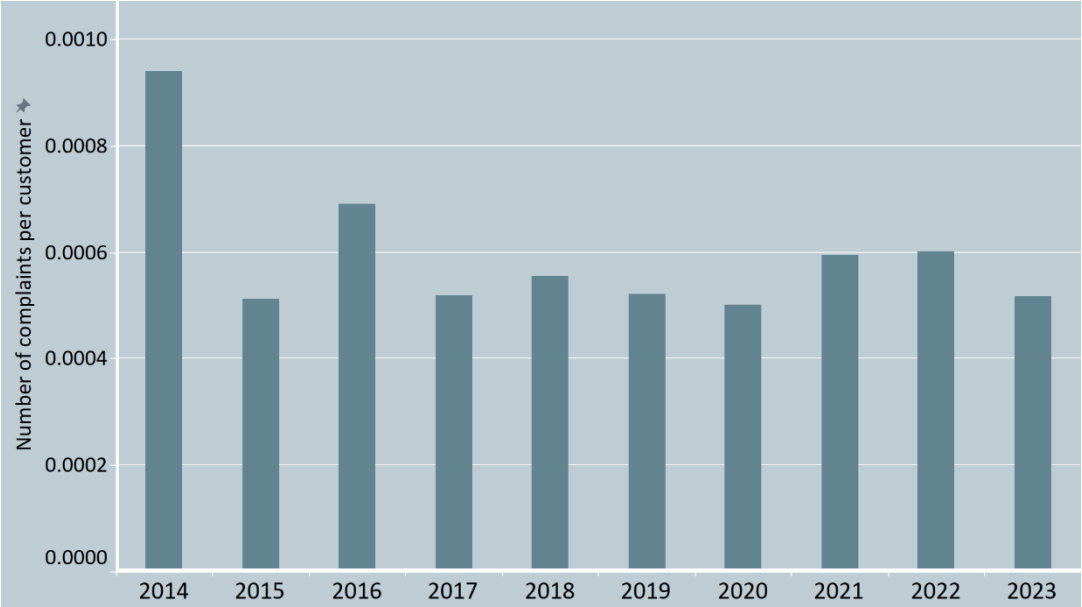
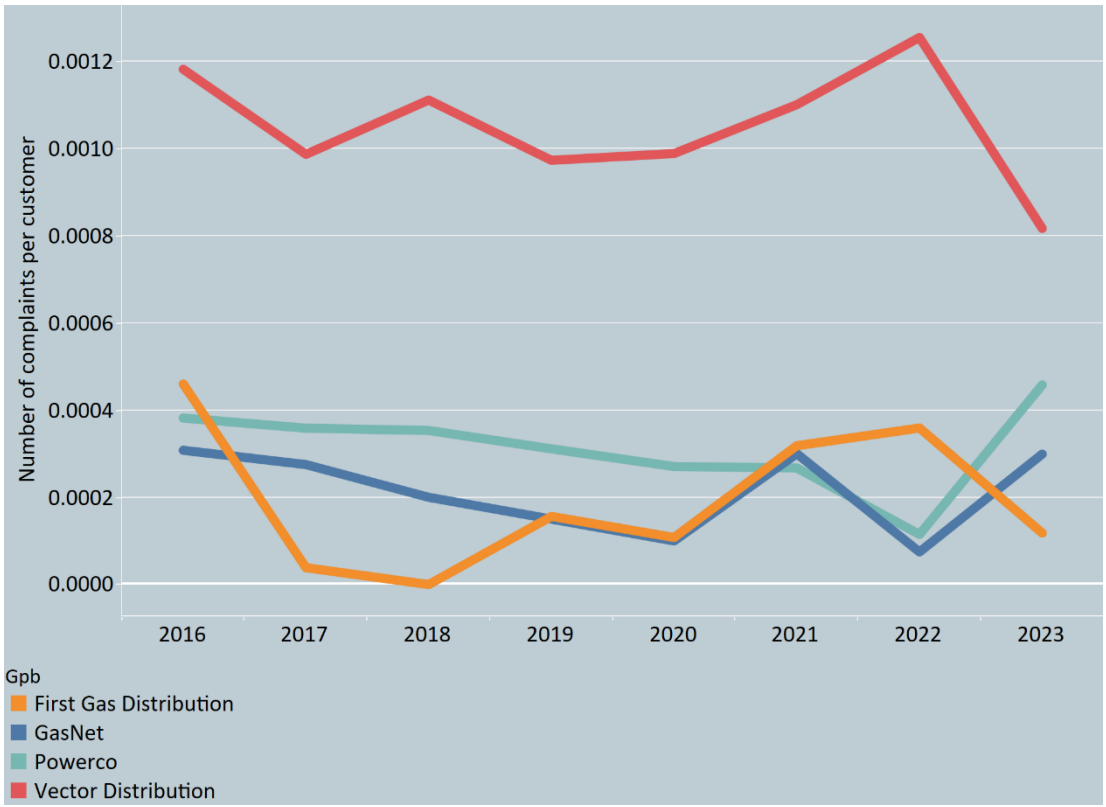


Figure 58: Average number of complaints per 1,000 customers for each local gas pipeline business, 2016-2023

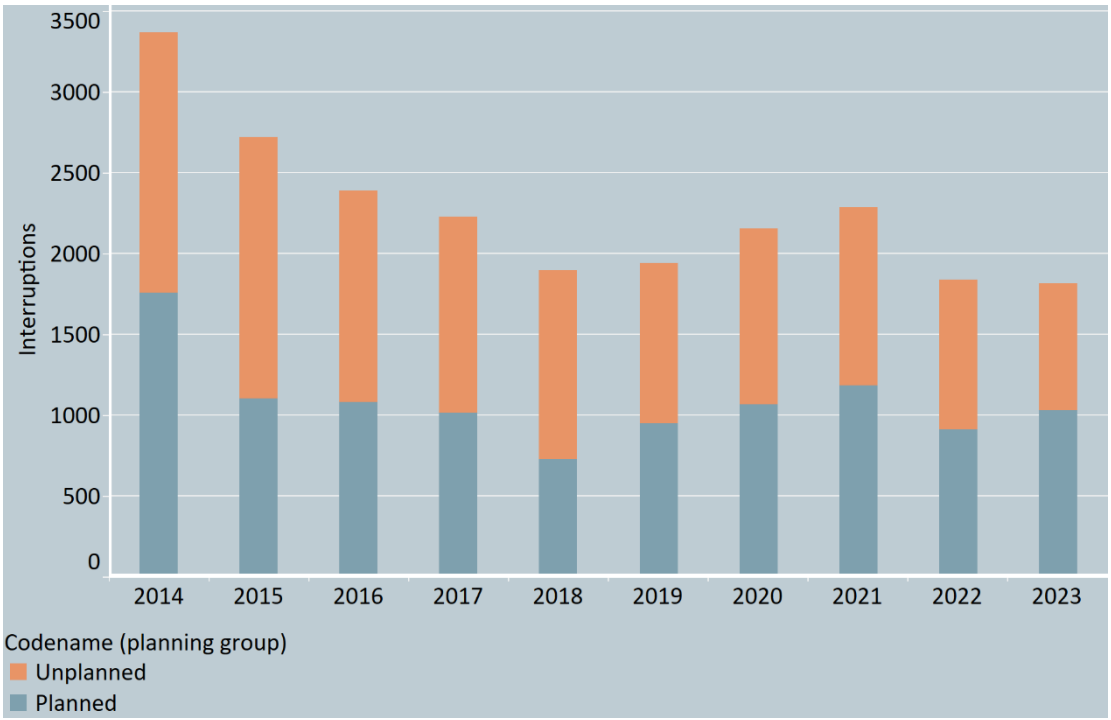


155. The average number of complaints per 1,000 customers has decreased over time between 2014 and 2023 and has fluctuated during this period. Vector received the most complaints per 1,000 customers on its network. The average number of complaints per 1,000 customers of Powerco, FirstGas, and GasNet has fluctuated over time during this period.

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

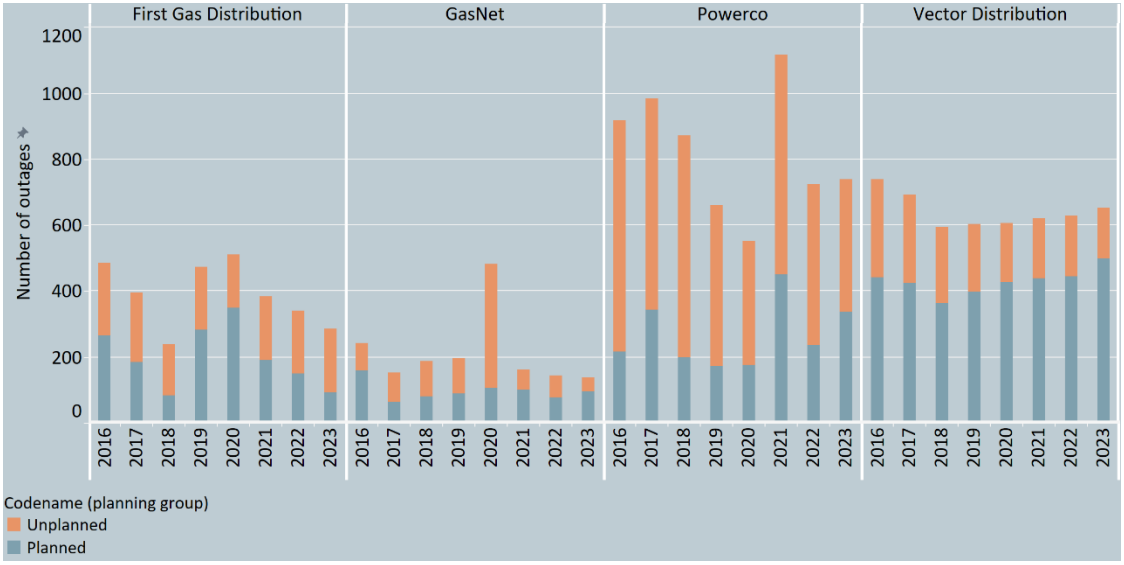
156. Interruptions can be either planned or unplanned interruptions. Figure 59 shows the total number of planned and unplanned interruptions for all local gas pipeline businesses between 2014 and 2023. Figure 60 shows the same interruption breakdown for each local gas pipeline business between 2016 and 2023.

Figure 59: Number of planned and unplanned interruptions for all local gas pipeline businesses, 2014-2023



157. The number of interruptions across all local gas pipeline businesses has generally been trending slightly downward for both planned and unplanned interruptions, between 2016 and 2023. Between 2014 to 2023, there were a larger proportion of unplanned interruptions than planned interruptions, occurring across seven out of ten years during this period.

Figure 60: Number of planned and unplanned interruptions for each local gas pipeline business, 2016-2023



158. The number of interruptions on a network is generally proportional to network size, however, between 2016 and 2018, and again in 2021, Powerco's interruptions were disproportionately high. In 2017 and 2021, this was driven by an increase in its planned interruptions in preparation for a pressure upgrade project in Wellington. In 2021, there were planned interruptions for the replacement of corroded risers in the Wellington, Hutt Valley and Porirua network region. A significant proportion of the unplanned interruptions resulted from leaks found on risers. FirstGas saw a reduction in the number of planned interruptions on its network in 2018, due to its work programme review, and fewer asset renewal and replacement programmes than in the year prior.[34] The increased number of interruptions on GasNet's network in 2020 is consistent with its elevated interruptions opex, resulting from a water leak flooding 9 km of gas mains and service pipes.

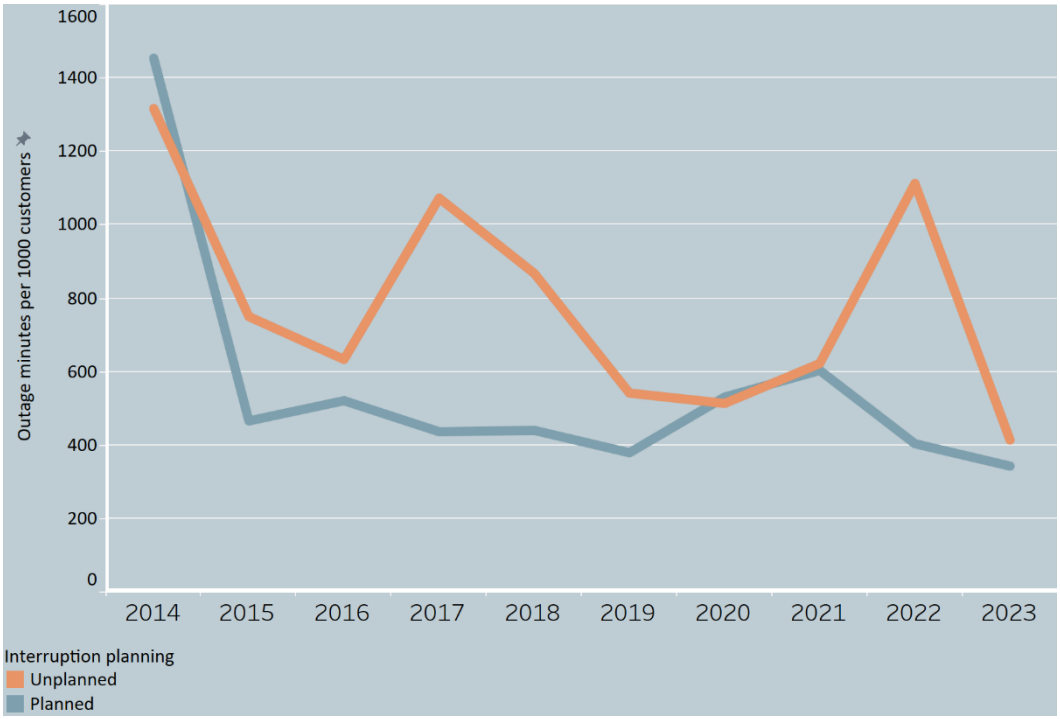
The average duration of interruptions has generally decreased or remained flat on most networks

159. Figure 61 shows the average length of interruption time experienced across all customers for all local gas pipeline businesses between 2014 and 2023, and Figure 62 shows the average length of interruption time experienced across customers for each local gas pipeline business between 2016 and 2023. Because the duration of

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

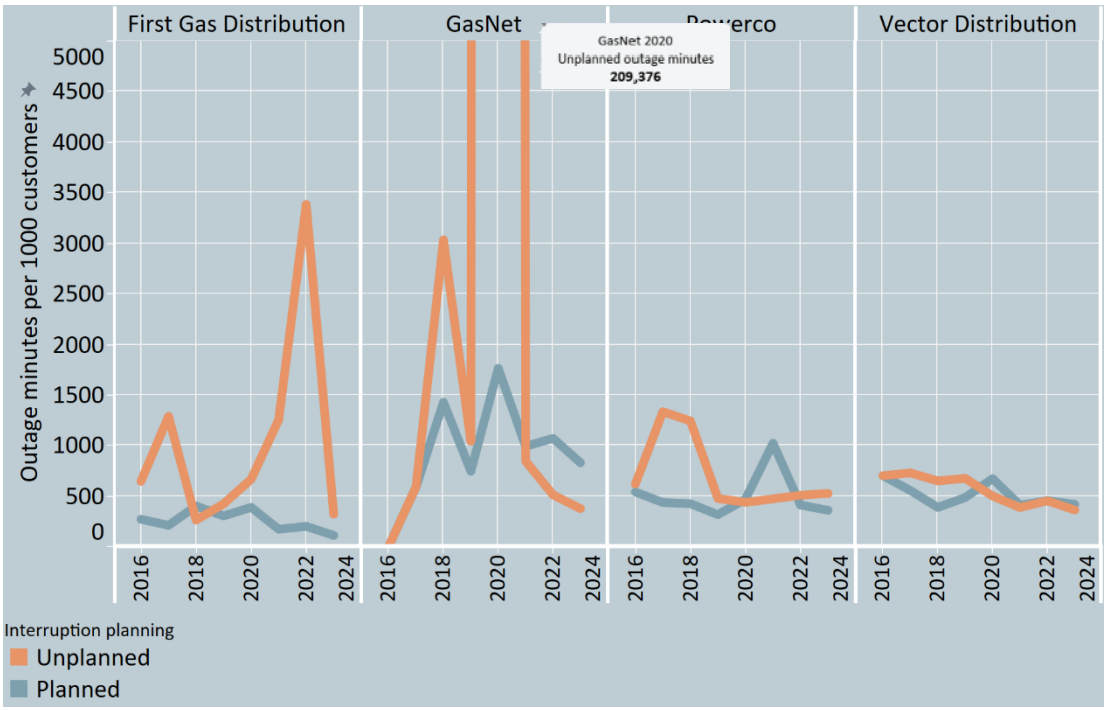
interruptions on local gas pipeline businesses is short, the metric is given in terms of interruption minutes per 1,000 customers.

Figure 61: Average length of planned and unplanned interruption time per 1000 customers for all local gas pipeline businesses, 2014-2023



160. On a per-customer basis, the duration of interruptions per 1,000 customers has, overall, decreased since 2014. The duration of planned interruptions per 1,000 customers has remained relatively flat from 2015 to 2023, while unplanned interruption duration per 1,000 customers has fluctuated to a greater degree over time. As a measure, the average length of interruption time across all customers (i.e., SAIDI) can be heavily impacted by small numbers of long duration events, even if the event impacted a small number of customers. Therefore, 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 interruption time per 1000 customers for each local gas pipeline business, 2016-2023



161. FirstGas experienced fluctuations in the number of unplanned interruptions per 1,000 customers. In 2018, FirstGas saw a reduction in the duration of unplanned interruptions per 1,000 customers on its network due to a reduced number and duration of temporary disconnections (for safety purposes or as agreed with the customer). However, it has been trending upwards, spiking in 2022. This was largely due to the gas main being damaged by contractor drilling, resulting in the gas main being isolated for 947 minutes. The duration of FirstGas' planned interruptions per 1,000 customers has been reasonably flat since 2016.

162. GasNet's unplanned interruptions also fluctuated between 2016 and 2023. In 2018, the high duration of unplanned interruptions was associated with water infiltrating a low-pressure gas main, interrupting supply to 24 properties for around 20 hours. In 2020, the number of unplanned interruption minutes increased dramatically to 209,376 minutes due to a water leak flooding 9 km of gas mains and service pipes. Planned interruption duration was also highest in 2018 and 2020, due to the occurrence of more main renewal activities which tend to be longer in duration.

163. Powerco experienced fluctuations in its planned and unplanned interruptions between 2016 and 2023, although to a lesser extent than FirstGas and GasNet. Increases in unplanned interruption duration per 1,000 customers in 2017 and 2018 were due to the following:

163.1 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.

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

164. Planned interruptions for Powerco increased in 2021 due to the replacement of corroded risers.

165. Vector's number of planned and unplanned interruptions has been relatively stable over time, with an overall decrease in both planned and unplanned interruptions between 2016 and 2023. In 2020 and 2021, there was a slight increase in the duration of planned interruptions per 1,000 customers. This was due to a small number of interruptions that had relatively long durations, and an increase in the number of interruptions associated with riser valve replacements.

The average frequency of interruptions across all local gas pipeline businesses has decreased since 2014

166. Figures 63 and 64 show the average number of interruptions experienced across all customers, across all local gas pipeline businesses between 2014 and 2023, and for each local gas pipeline business between 2016 and 2023. As with the duration of interruptions on local gas pipeline businesses, the frequency of interruptions per customer is small, so this metric is given in terms of interruptions per 1,000 customers.

Figure 63: Average number of planned and unplanned interruptions per 1000 customers for all local gas pipeline businesses, 2014-2023

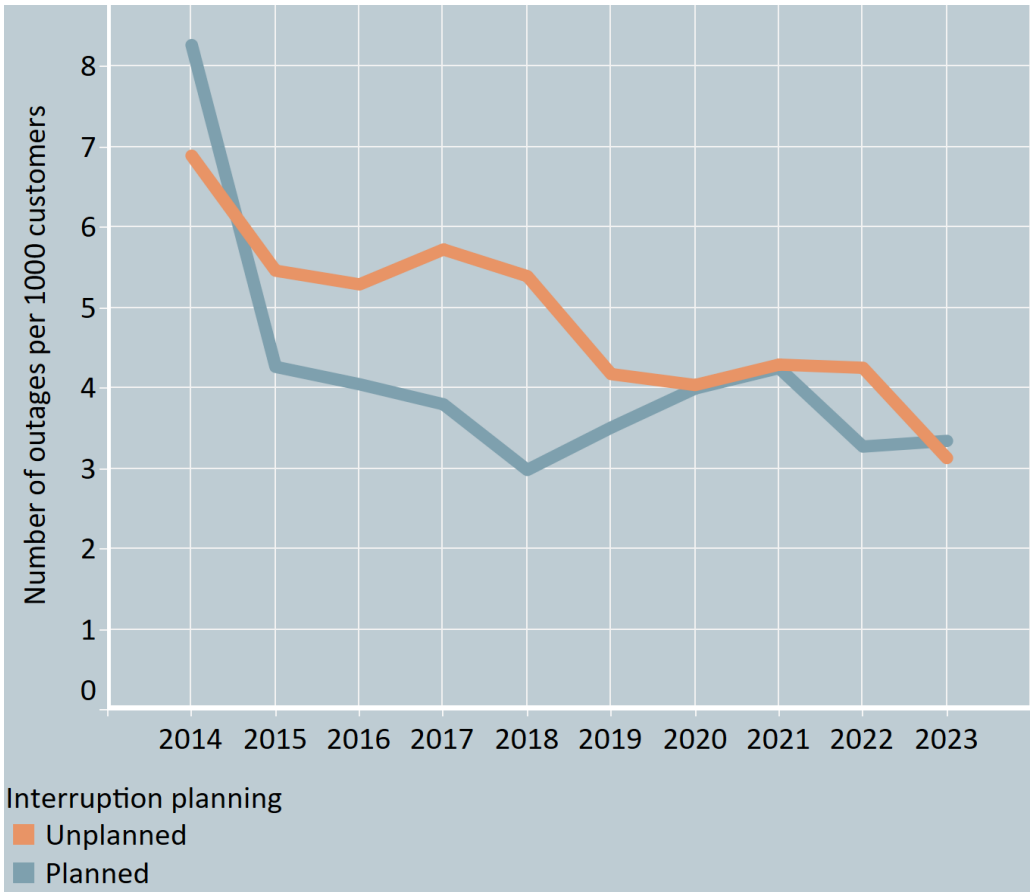
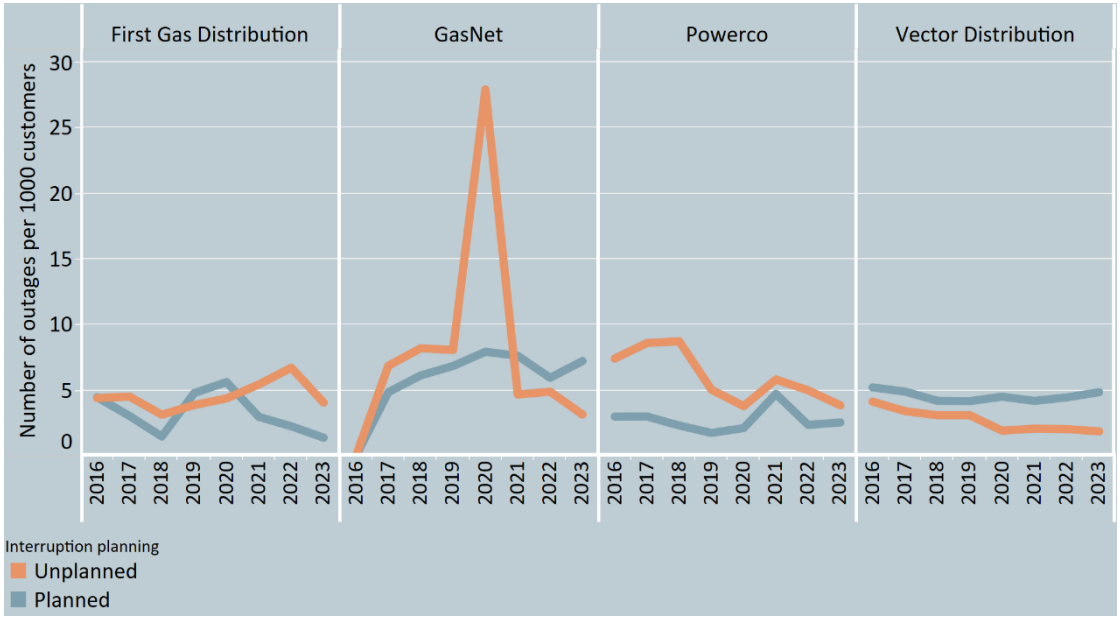


Figure 64: Average number of planned and unplanned interruptions per 1000 customers for each local gas pipeline business, 2016-2023



167. The average number of planned and unplanned interruptions per 1,000 customers has generally decreased since 2014, with fluctuations throughout the years. The average number of planned interruptions per 1,000 customers has remained relatively flat since 2015, while the unplanned interruption frequency per 1,000 customers fluctuated to a greater extent than planned interruption frequency.

168. Overall, the frequency of unplanned interruptions per 1,000 customers has fallen for Vector and Powerco between 2016 and 2023. Vector's frequency of planned interruptions per 1,000 customers has been steady over time while Powerco had a small uptick in both planned and unplanned interruptions.

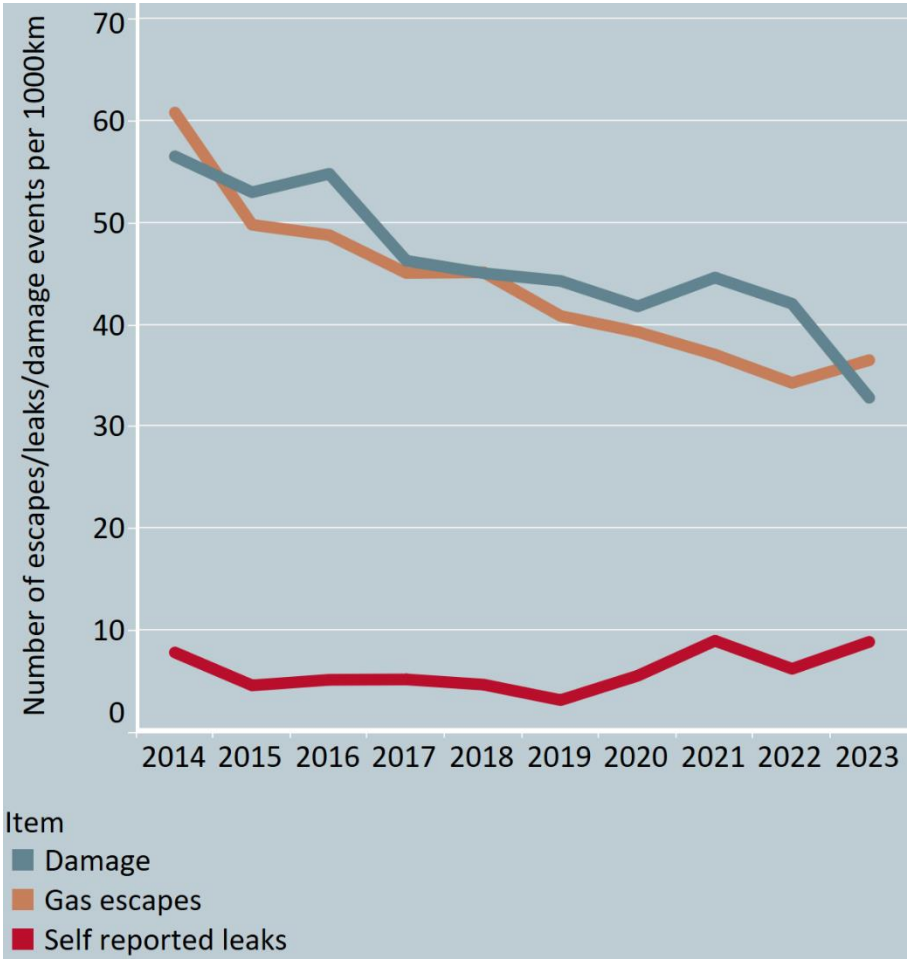
169. FirstGas' frequency of planned interruptions has fluctuated over time, with an overall decreasing trend between 2016 and 2023. FirstGas saw a reduction in the frequency of planned interruptions per 1,000 customers on its network in 2018, due to its work programme review and fewer asset renewal and replacement programmes than in the year prior. Its frequency of unplanned interruptions per 1,000 customers has trended upward over time.

170. The higher frequency of unplanned interruptions per 1,000 customers on GasNet's network in 2020 is consistent with increased duration of unplanned interruptions per 1,000 customers and elevated interruptions opex, resulting from flooding of gas mains and service pipes. In 2021 and beyond, the frequency of GasNet's unplanned and planned interruptions dropped back down to the levels of previous years.

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

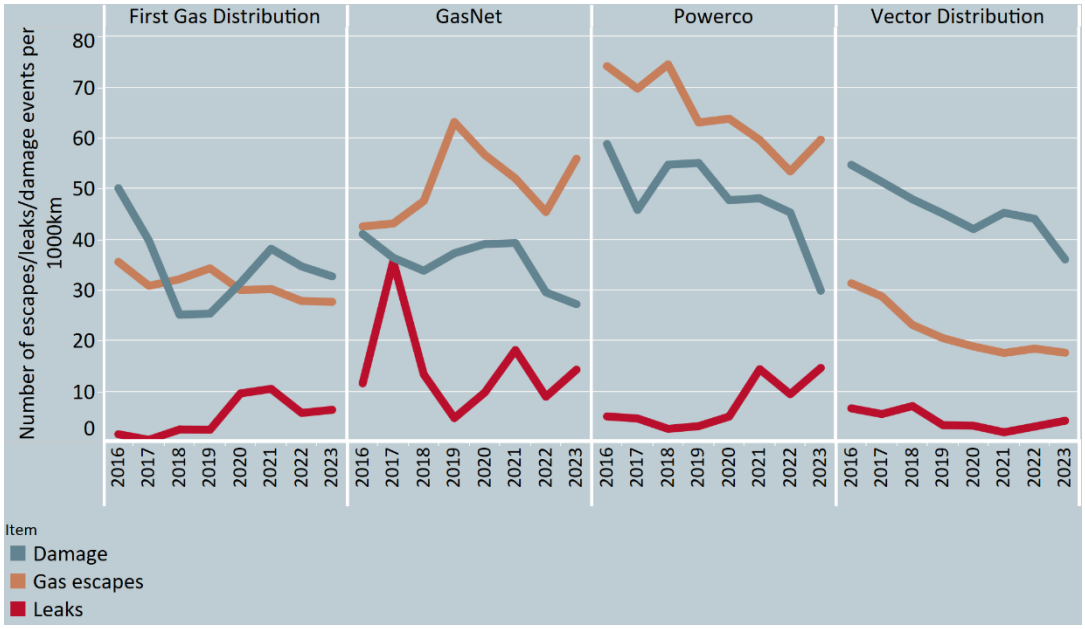
171. The number of publicly reported gas escapes, self-reported leaks found through survey, and third-party damage, are indicators of network condition and integrity. Figure 65 shows the publicly reported gas escapes, self-reported leaks and third-party damage events across all local gas pipeline businesses between 2014 and 2023. Figure 66 shows the same damage events for each local gas pipeline business between 2016 and 2023.

Figure 65: Publicly reported gas escapes, self-reported leaks and third-party damage events across all local gas pipeline businesses, 2014-2023



172. Publicly reported gas escapes and third-party damage events per 1,000km of system length across all local gas pipeline businesses have been declining steadily since 2014, by 39.9% and 41.9% respectively. The number of leaks per 1,000km of system length (self-reported and discovered through survey) has increased by 13.2% between 2014 and 2023.

Figure 66: Publicly reported gas escapes, self-reported leaks and third-party damage events for each local gas pipeline business, 2016-2023



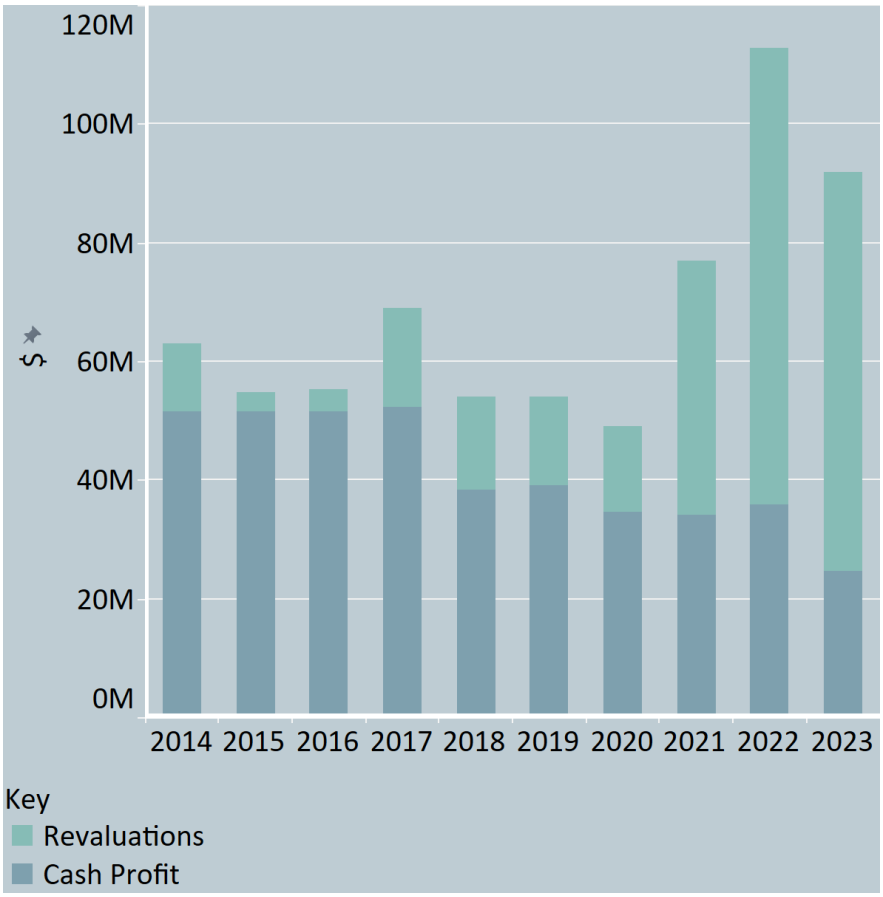
173. Powerco has experienced the highest number of publicly reported gas escapes and third-party damage events per 1,000km of system length, but this has been decreasing from 2016 to 2023. Vector and FirstGas have also seen decreases in publicly reported gas escapes and third-party damage events per 1,000km of system length over the same period. GasNet, however, has seen an increase in reported gas escapes in 2019 and 2023, while the number of third-party damage events per 1,000km of system length has declined overall between 2016 and 2023.

174. The trend in the number of self-reported leaks per 1,000km of system length has varied across each local gas pipeline business since 2016. FirstGas, GasNet, and Powerco's self-reported leaks has increased overall between 2016 and 2023, with GasNet's trend fluctuating during this period. In 2017, GasNet had an increase in self-reported leaks due to an area survey which included much of the company's low pressure metallic network. Vector's self-reported leaks has remained fairly steady over this period, with a slight decrease over time.

Local gas pipeline businesses' regulatory profit has increased significantly in the last three years

175. Local gas pipeline businesses collectively made $91.8 million in regulatory profit in 2023, made up of $24.7 million in cash profit and $67.1 million in asset revaluations. Figure 67 shows the trend in cash profit after tax and revaluations for all local gas pipeline businesses between 2014 and 2023.

Figure 67: Total regulatory profit after tax across all local gas pipeline businesses, 2014-2023



176. The regulatory profit after tax across all local gas pipeline businesses has increased by 45.7% between 2014 and 2023. This increase has been driven by revaluations which increased by $55.7 million or 488.6% across all local gas pipeline businesses since 2014.

177. Asset revaluations in 2021, 2022 and 2023 have made up a large proportion of the overall regulatory profit. The increase in revaluations was driven by higher rates of inflation between 2021 and 2023. 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. Between 2021 and 2023, inflation was relatively high compared to previous years, which is consistent with larger gains in asset revaluations.

178. Cash profit has decreased by $26.9 million or 52.1% since 2014, with a distinct step down from 2018 onwards. Cash profits have decreased 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 reduced. This was reflected in a change to the

return we allowed local gas pipeline businesses to earn on their investments for a five-year period, starting in 2018. This meant 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 7.1% per year from 2014 to 2023.

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

179. 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.

180. 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 (i.e., profit beyond what they would be expected to earn).

181. Figure 68 shows:

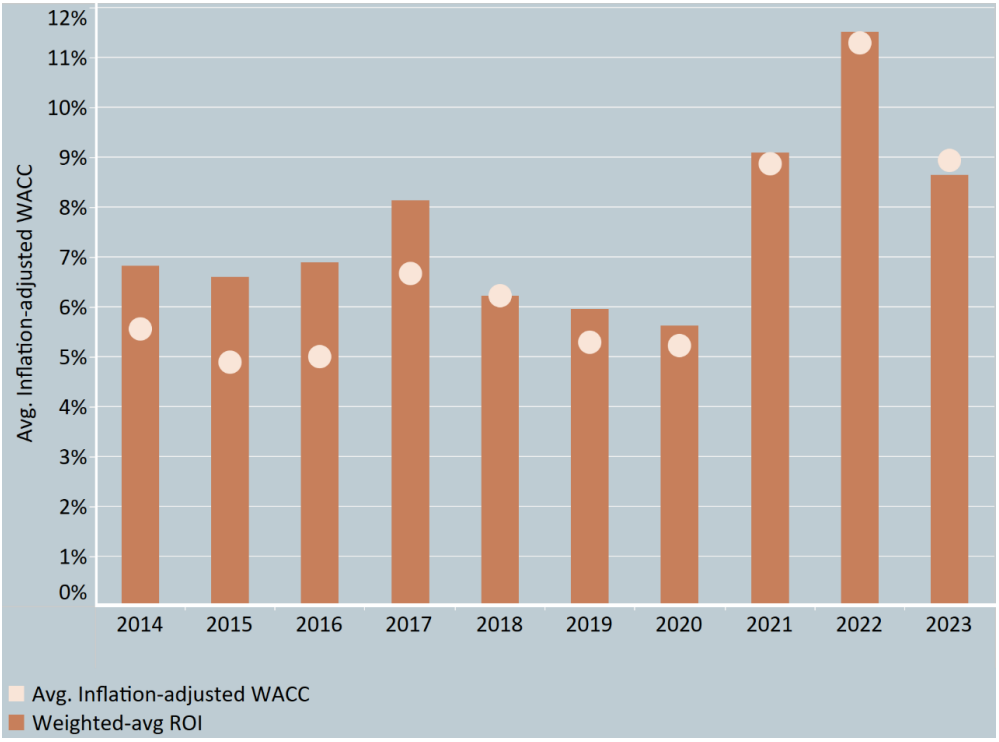
    181.1 the return on investment: total regulatory profit after tax expressed as a percentage of the total value of assets across all local gas pipeline businesses between 2014 and 2023; and

    181.2 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.

182. 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.[35]

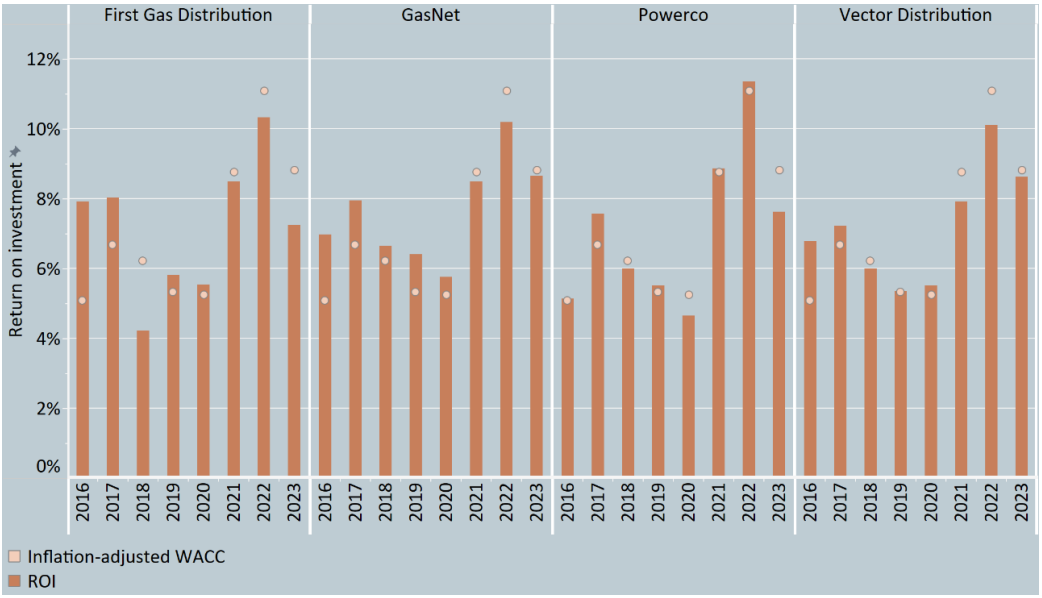
[35] Under real financial capital maintenance, a regulated supplier can earn profits that compensate for its cost of capital over time (considering its exposure to risk) i.e., to earn a 'normal return'. Allowing a regulated supplier the opportunity (but not guarantee) to earn normal returns over the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

Figure 68: Return on investment vs post-tax WACC adjusted for ex-post inflation across all local gas pipeline businesses, 2014-2023



183. At the industry level, the adjusted return on investment has been broadly consistent with the estimated cost to invest. 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 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 2023.

Figure 69: Return on investment vs post-tax WACC adjusted for ex-post inflation for each local gas pipeline business, 2016-2023



184. 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. FirstGas' 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. FirstGas' return on investment was low in 2018 due to an increase in business support opex. In 2021 to 2023, higher inflation drove the increase in adjusted WACC compared to returns in prior years.

185. 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, 5.85% for the 2018 to 2022 disclosure years, and 5.67% for the 2023 to 2026 disclosure years. Ex-post inflation was lower for every quarter than the forecast inflation used in setting the 2013-2017 DPP (DPP1), resulting in adjusted WACC figures between 4.97% and 6.67%. Ex-post inflation was generally higher prior to March 2020 than the inflation used in setting the 2017-2022 DPP (DPP2), resulting in adjusted WACC figures between 5.25% and 8.76%. In the 2023 to 2026 DPP (DPP3), adjusted WACC figures were between 9% and 11%. In the last three years, despite high rates of inflation, the return on investment has been less than the inflation-adjusted WACC, suggesting that local gas pipeline businesses were not making excessive returns.

186. 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 ten years.

Chapter 3 – Performance of gas transmission businesses

Purpose of this chapter

187. 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 they provide. The aim is to provide insight into issues that have affected gas transmission businesses in recent years, and, where possible, the underlying drivers of the trends or anomalies observed.

188. 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 (FirstGas) existing since then. More detail on the gas transmission asset transaction is provided in the 'overview' section below and within the Approach paper.

189. 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.

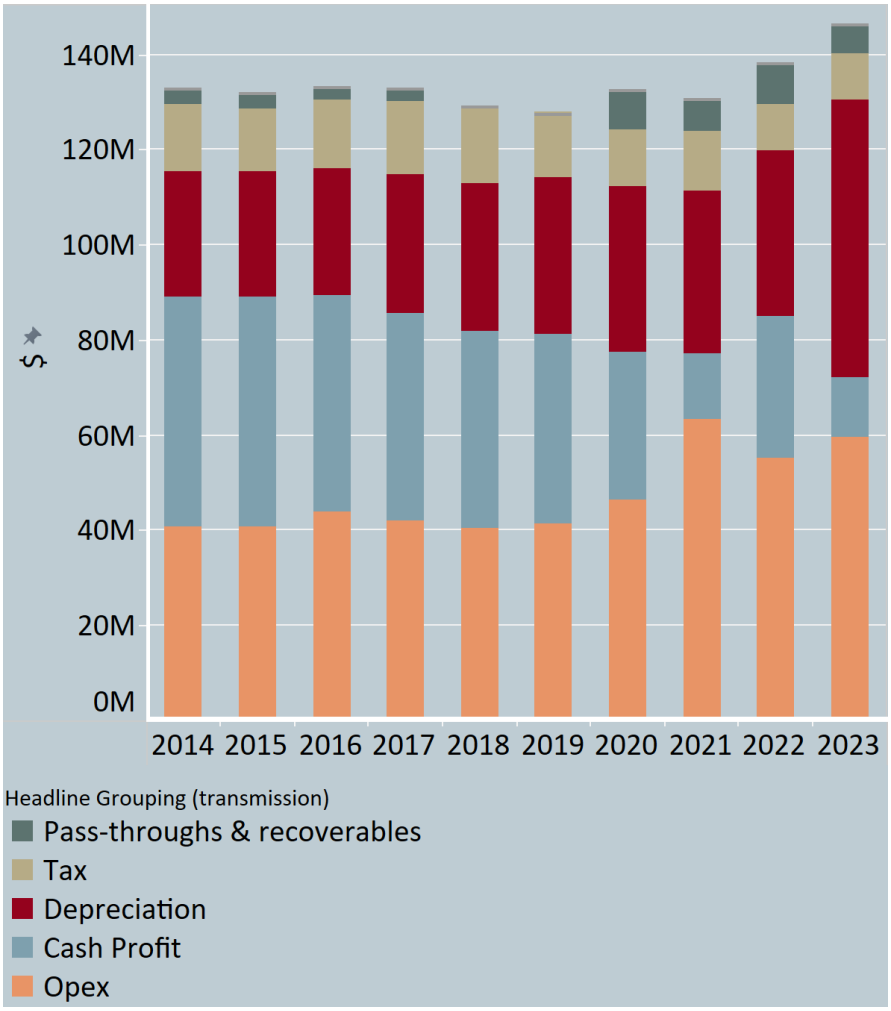
190. The charts and figures for monetary data are given in nominal terms unless otherwise stated, i.e., they have not been adjusted to exclude the impact of inflation.

Key findings

191. Gas transmission businesses' regulated revenue has remained relatively stable at around $146 million in 2023, an increase of $13.6 million in nominal terms since 2014. After accounting for general price inflation, gas transmission revenues have fallen by 14.7% since 2014.

192. Figure 70 shows the components of revenue which were recovered between 2014 and 2023.

Figure 70: Breakdown of gas transmission business revenue, 2014-2023



193. Opex and depreciation comprise the largest components of gas transmission revenues in 2023, at 40.6% and 39.9% respectively. Opex has increased by $18.8 million in nominal terms, or 3.9% per year on average since 2014, with the large increase in 2021 primarily due to the Gas Transmission Access Code (**GTAC**) project discontinuation. Depreciation has increased by $32 million in nominal terms or 8.3% on average between 2014 and 2023. Most of this increase occurred in the 2023 year.

194. Between 2014 and 2023, cash profit earned by gas transmission businesses decreased by $35.5 million, from $48.3 million in 2014 to $12.8 million in 2023, or 12.4% per year on average. The rate of return of gas transmission businesses is mostly in line with our estimates of a reasonable rate of return when adjusted for inflation. This suggests that gas transmission businesses have generally not made excessive profits over the last ten years.

195. In 2023, gas transmission businesses' capex was $41.3 million, 77.3% higher than in 2014. The regulated asset base of FirstGas (upon which their total return on assets is based) was valued at $983 million in 2023, an increase of $190.5 million (21.8%) since 2014.

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

197. 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 $12.8 million, with the historical project amounts written off to business support opex. The one-off adjustment resulted in increased business support opex, and decreased capex, and flows onto the reduction in the cash profit for the year as well as a reduced return on investment (**ROI**), compared to if the adjustment was not made.

198. Investment in gas transmission pipelines has focussed on maintaining network assets, followed by 'supporting growth' capex. The 'maintaining assets' category of capex has increased by $23.1 million in nominal terms since 2014.

199. Supporting growth capex and other ancillary investment have been sporadic, and generally declined over time between 2014 and 2023. Most of supporting growth capex in the last three years (2021 to 2023) has been dedicated to system growth, moving away from new connection capex, which took up the majority of expenditure in the years prior to 2021.

200. The cost of operating gas transmission businesses averaged $47 million per year between 2014 and 2023, increasing by $17.5 million since 2014, to $58.1 million. Non-network opex costs made up 70% of opex between 2014 and 2023, an increase of 6.1% per year on average during that time.

201. The number of planned interruptions for gas transmission businesses has remained low between 2018 and 2023, while the number of unplanned interruptions has fluctuated over this period. The number of incidents has fluctuated over this period as well, with a slightly higher number of incidents in 2023 compared to 2018. Average compressor utilisation across all units has decreased in 2022 and 2023, after a relatively stable period beforehand. The number of failed starts has decreased over

time. The trend of the number of instances of compressors being unavailable when required has slightly increased over time.

Overview of gas transmission

202. The gas transmission business, FirstGas, 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, and large greenhouses.

203. As FirstGas owns the entire gas transmission network. Prior to 2016, ownership of the gas transmission was split between MDL and Vector.

203.1 Any reference to "gas transmission businesses" may refer to either MDL and Vector, FirstGas Transmission alone, or all three businesses. Within this chapter, "FirstGas" refers to the FirstGas transmission business (i.e., not the local gas pipeline business).

203.2 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.

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

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

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

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

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

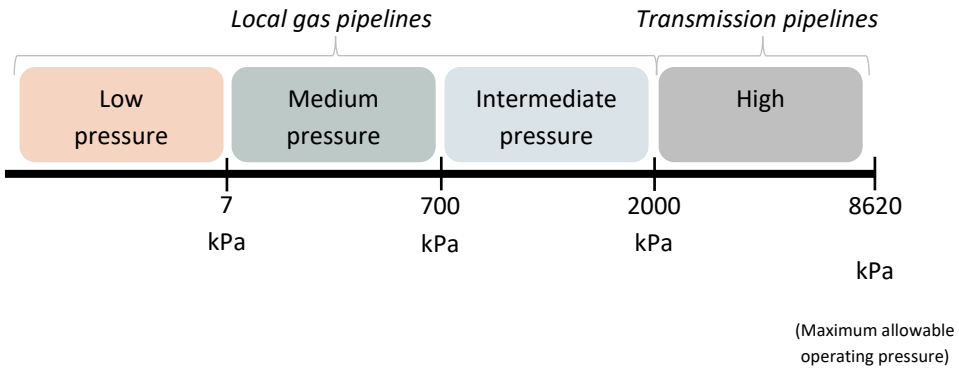
204.5 other station components:

- heating systems (to prevent operating issues arising from the temperature decreases associated with pressure reduction for local gas pipeline networks);
- odorisation plants (for leak detection);

- coalescers (to filter out solids and liquids);
- communications (i.e., SCADA systems);
- corrosion protection (i.e., cathodic protection systems); and
- gas chromatographs (to detect and analyse chemical composition).

205. Gas transmission pipelines transport gas at pressures between 2,000 kPa and 8620 kPa (the latter being the maximum allowable operating pressure of most of FirstGas' 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



206. The length of the gas transmission pipeline system, as at the end of the 2023 disclosure period, was 2,519km. Table 5 shows the length of gas transmission pipelines in each region, and the volume of gas conveyed through them in the 2023 disclosure period.

Table 5: Length and gas conveyed through each region's transmission pipelines in 2023 (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	32,183
Bay of Plenty	608	9,152

North	541	23,821
Te Awamutu North	11	610
Maui Pipeline	309	118,705
Minor	16	283
Whole network	2,519	184,754

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

207. At least every five years we review the DPP that applies to gas transmission businesses. The previous reset was in May 2022, and became applicable from 1 October 2022.

208. 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:

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

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

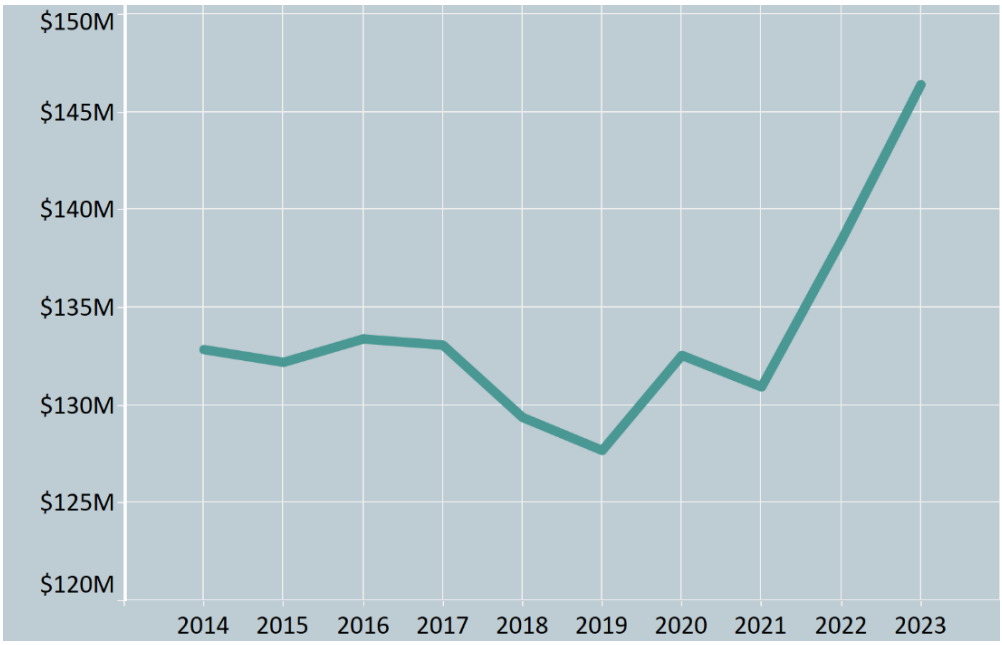
    208.3 our forecast of the opex of the gas transmission business during the regulatory period.

209. In contrast to local gas pipeline businesses, the gas transmission business is 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 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 increased in the last ten years, with a large increase between 2021 to 2023

210. 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 revenue they are allowed to collect is set by the DPP, most recently reset in October 2022. Figure 72 shows the total revenue collected by gas transmission businesses from 2014 to 2023.

Figure 72: Gas transmission businesses' total revenue, 2014-2023



211. Gas transmission businesses' revenue was relatively steady from 2014 to 2017, then decreased in 2018 and 2019. Since 2019, revenue of gas transmission businesses has generally increased, apart from 2021 which had a small decrease. In 2023, gas transmission businesses' revenue was $146.4 million, increasing by $13.6 million in nominal terms, or 10.2%, since 2014.

After accounting for general price inflation, gas transmission business revenues have fallen by 14.7% since 2014

212. Figures 73 and 74 show the change in CPI between 2014 and 2023, and the change in revenue adjusted for inflation (i.e., in real terms) since 2014.

Figure 73: Annual rate of inflation, years ending September, 2014-2023

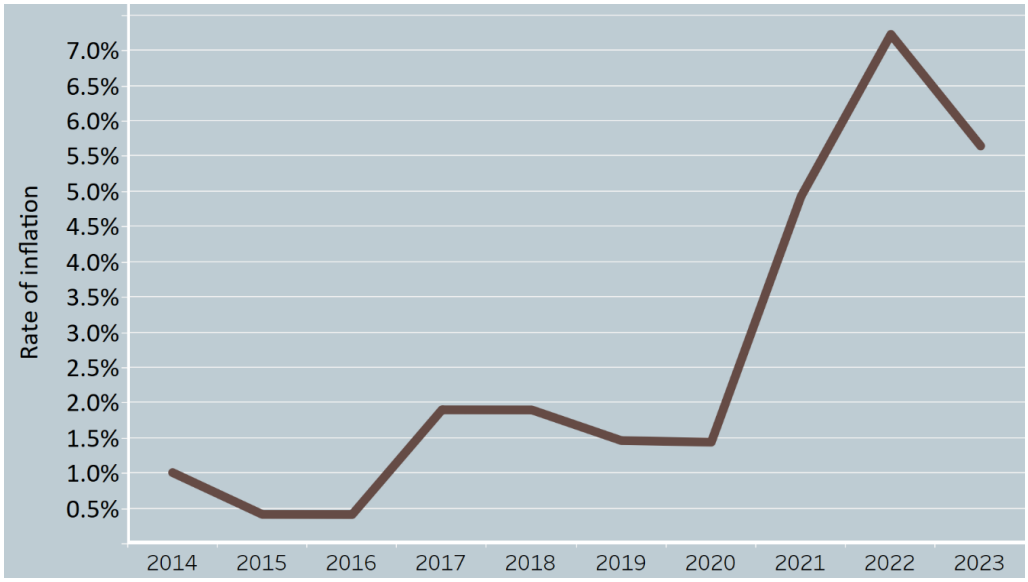
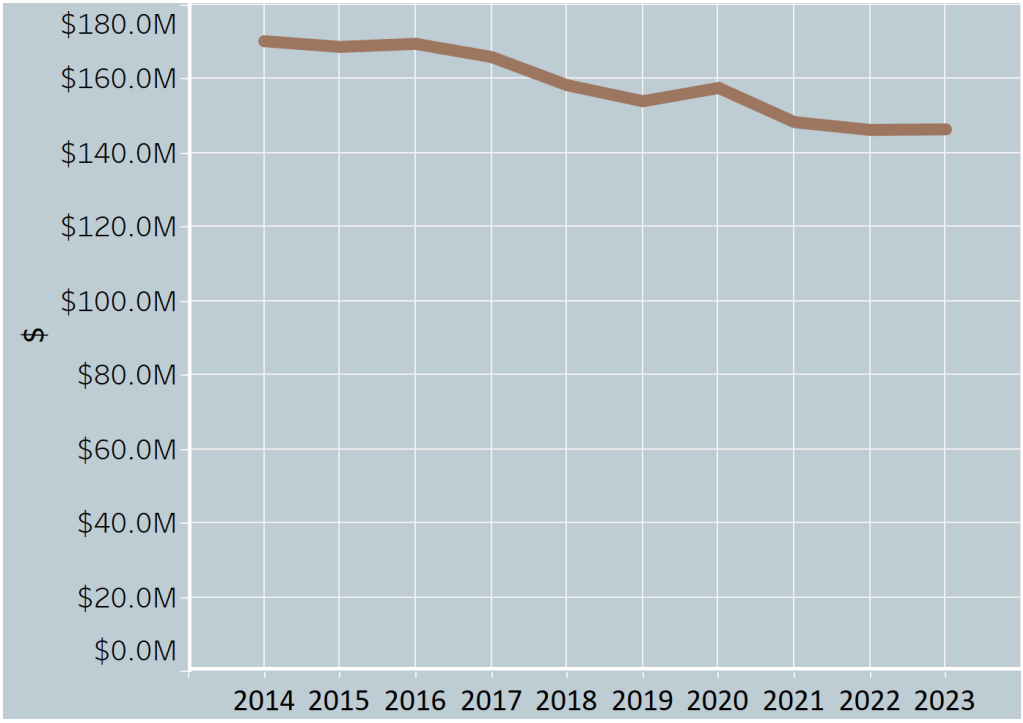


Figure 74: Change in total gas transmission business revenue, adjusted for inflation (i.e., in real terms), 2014-2023



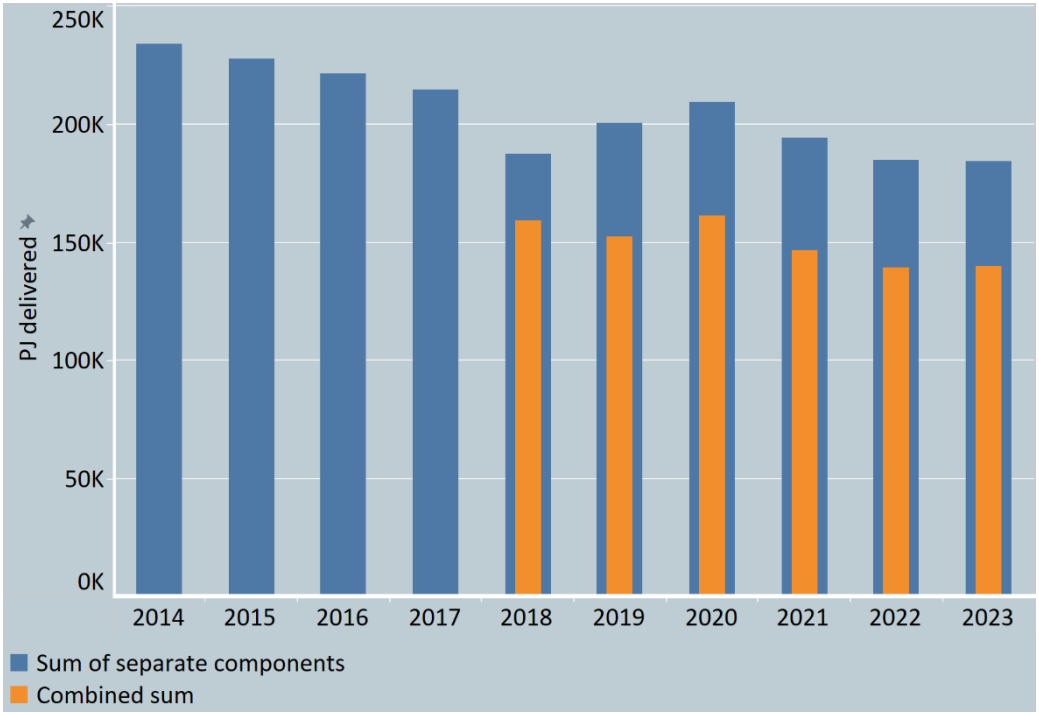
213. CPI has increased by approximately 2.6% per year on average (29.4% in total), between 2014 and 2023. Between 2014 and 2020, the CPI has been relatively steady, ranging from 0.5% to 2.0%. However, in 2021, CPI increased to nearly 5%, and increased further in 2022 to 7.2%, before declining slightly in 2023 to 5.6%. Using CPI to adjust for inflation, revenues have fallen by $23.8 million, or 14.0%, between 2014 and 2023.

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

214. The volume of gas delivered via gas transmission pipelines is far higher than the volume carried through local gas pipeline networks because most gas consumed in New Zealand is by large industrial users, connected directly 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, therefore customer numbers are not used to represent growth in this chapter.

Figure 75 shows the gas delivered via gas transmission pipelines between 2014 and 2023.

Figure 75: Total energy delivered through gas transmission pipelines, 2014-2023



215. Figure 75 includes two data series:

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

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

216. As gas delivered may be transported via both these interconnected pipeline systems, 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.

217. The long-running data series indicates a drop in volumes delivered between 2017 and 2018. This is consistent with the beginning 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.[36] The decline in energy delivered continued through to 2023.

Gas transmission businesses' revenue recovers five primary components, with opex and depreciation comprising 40.6% and 39.9% respectively in 2023

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

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

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

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

218.4 tax, which is primarily driven by profit; and

218.5 pass-through costs, which are the costs of services provided by other parties (e.g., rates, Commerce Act and industry levies), and recoverable costs, which the gas transmission business is permitted to recoup (e.g., balancing gas and Mokau compressor fuel costs). These costs are bundled into network charges and FirstGas either passes on the funds it receives from customers (via

[36] Ministry of Business, Innovation and Employment data tables for gas, here (viewed on 7 December 2022)

retailers) to the parties that it provides the service to, or uses the funds to recoup specific costs, without any mark-up.[37]

219. 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 2023.

220. **Figure 76: Breakdown of gas transmission business revenue, 2014-2023**

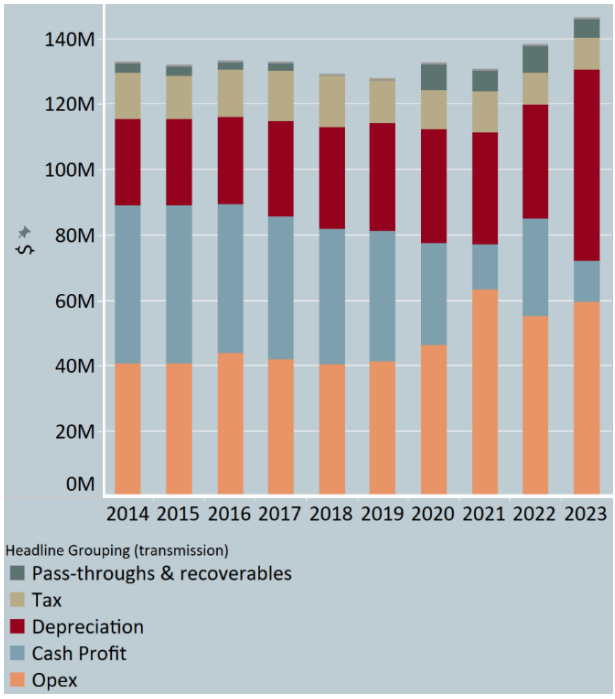
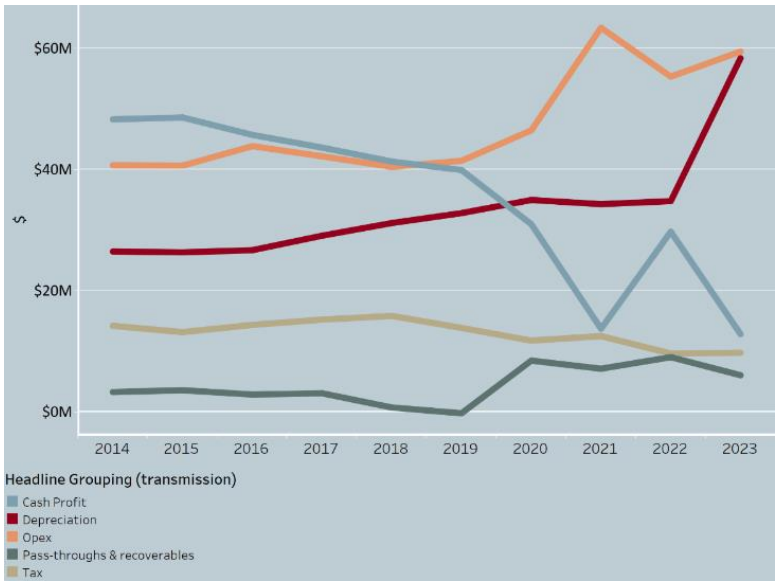


Figure 77: Trends in gas transmission business revenue components, 2014-2023



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

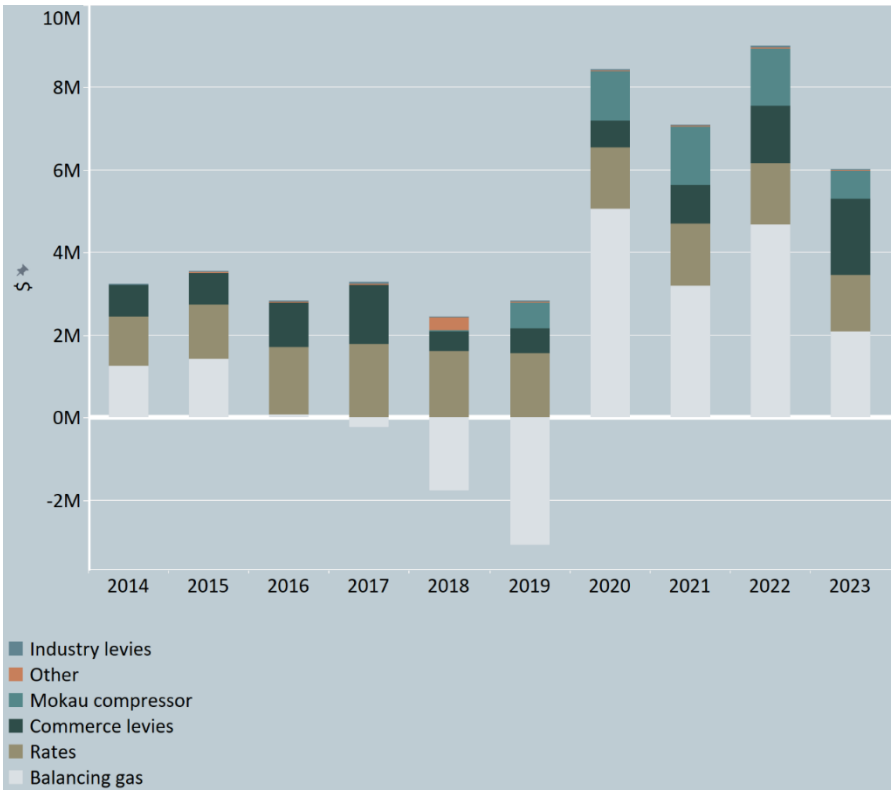
221. Between 2014 and 2020, depreciation increased consistently, plateauing in 2021 and 2022, and increased dramatically in 2023. The sharp increase in 2023 was due to shortened asset lives, leading to accelerated depreciation under DPP3. Depreciation accounted for 39.9% of gas transmission businesses' revenue in 2023, and 25.1% of total revenue between 2014 and 2023.

222. The cash profit component has reduced from $48.3 million to $12.8 million, a reduction of $35.5 million, or 12.4%, per year on average between 2014 and 2023. Profit and return on investment are described in further detail at the end of this chapter.

223. Tax has decreased slightly by $4.5 million from 2014 to 2023, decreasing at 3.7% per year on average, following the downward trend in cash profits.

224. Pass-through and recoverable costs are a small component of revenues and were fairly stable in nominal terms between 2014 and 2017; however, have been more volatile between 2018 and 2021, before flattening out in 2022 and 2023. Figure 78 shows the breakdown of pass-through and recoverable costs for gas transmission between 2014 and 2023.

Figure 78: Breakdown of gas transmission businesses' pass-through and recoverable costs, 2014-2023



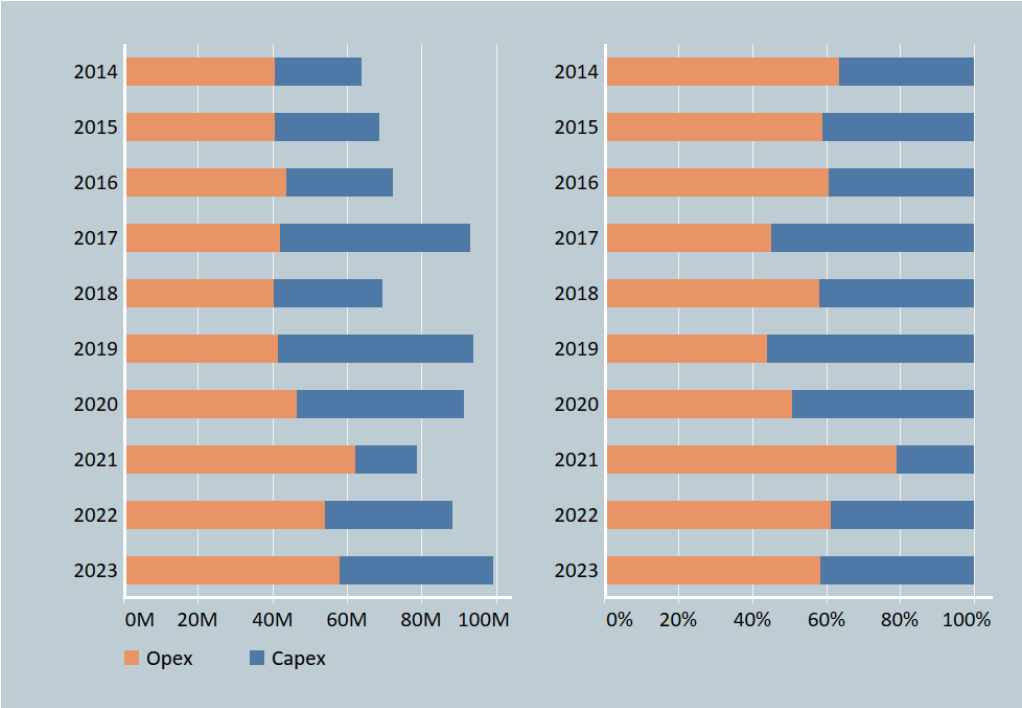
225. Rates costs are a consistently large component of pass-through and recoverable costs, accounting for 34.6% of costs between 2014 and 2023. Balancing gas was the second largest component of pass-through and recoverable costs, accounting for 29.5% of total costs during this period.

226. 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's production decline since 2018 has led to tight supply in the spot gas market, which has driven up spot prices. In 2018 and 2019, FirstGas experienced negative costs from selling more balancing gas at higher prices than it purchased, but in 2020 and 2021, the cost of its balancing gas purchases at high gas spot prices, outweighed any revenue from balancing gas sales.

In 2023, gas transmission businesses' capex was $41.3 million, 77.3% higher than in 2014

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

Figure 79: Total capex vs opex for gas transmission businesses, 2014-2023



228. 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, i.e., 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.

229. 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.

230. For the ten years between 2014 and 2023, capex has also been growing as a proportion of total expenditure at an average of 1.3% per year since 2014. On the other hand, opex has decreased as a proportion of total expenditure at 0.8% per year on average since 2014.

231. 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.

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

    232.1 *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, e.g., pipelines, line valves, protection, and control systems.

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

233. 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

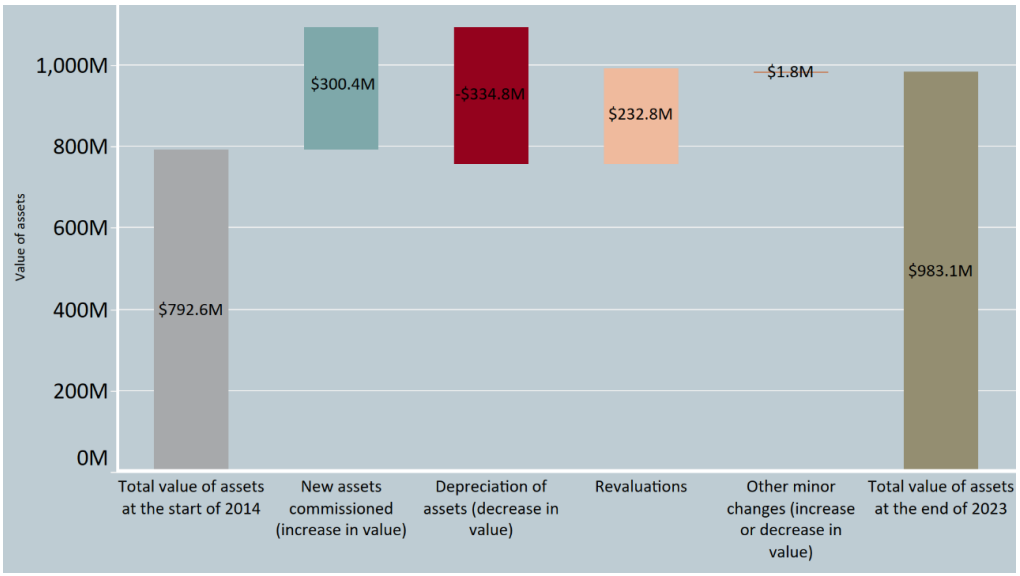
Category used	Capital expenditure category in ID	Capex type	Purpose of capex
Maintaining assets	Asset replacement and renewal	Network	To mitigate deterioration of assets or their surroundings, or address obsolescence of assets
	Reliability, safety and environment	Network	To improve the quality or safety of the network for customers to meet regulatory requirements, or achieve

			enhancements related to the environment
Supporting growth	Customer connections	Network	To establish new connection points for customers on the network, or alter existing connection points
	System growth	Network	To meet a change in demand on the network (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 FirstGas was valued at $983.1 million in 2023, an increase of $190.5 million since 2014

234. Capex contributes to the growth of the gas transmission businesses' RAB once assets are commissioned. Figure 80 shows the drivers of changes to the total RAB value for gas transmission between 2014 and 2023.

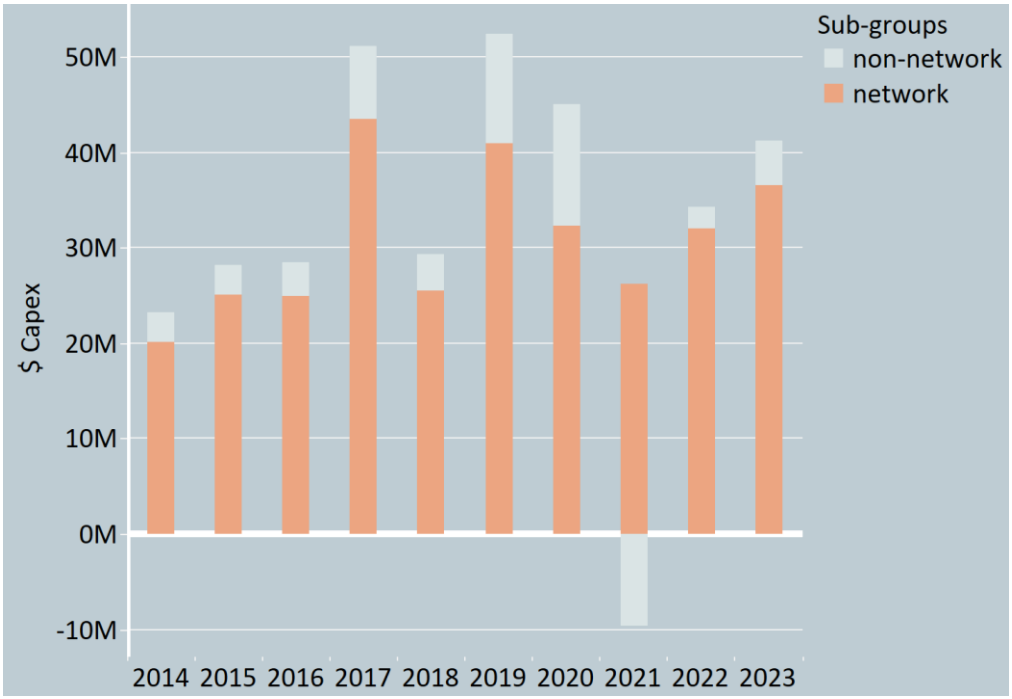
Figure 80: Waterfall of changes in gas transmission RAB, 2014-2023



235. Newly commissioned assets and depreciation are the largest components of the change in the RAB since 2014, with a $300.4 million increase and a $334.8 million decrease, respectively. Depreciation has more than offset the increase in the value of the RAB contributed by newly commissioned assets. Asset revaluation increased the RAB value by $232.8 million over the same period. In total, FirstGas has a RAB valued at $983.1 million in 2023, an increase of $190.5 million, or 24%, since 2014.

236. The RAB is composed primarily of network assets, indicating 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 2023.

Figure 81: Split of gas transmission businesses' network vs non-network capex, 2014-2023



237. Network capex has increased by $16.5 million in nominal terms between 2014 and 2023, or 6.2% each year between 2014 and 2023. On average, non-network capex increased by 3.9% per year between 2014 and 2023. 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 contributed to depreciation increasing by $32 million since 2014

238. Commissioned capex ultimately flows through to the prices customers pay for the services they receive 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 2023.

Figure 82: Gas transmission businesses' total depreciation and as a percentage of closing RAB, 2014-2023

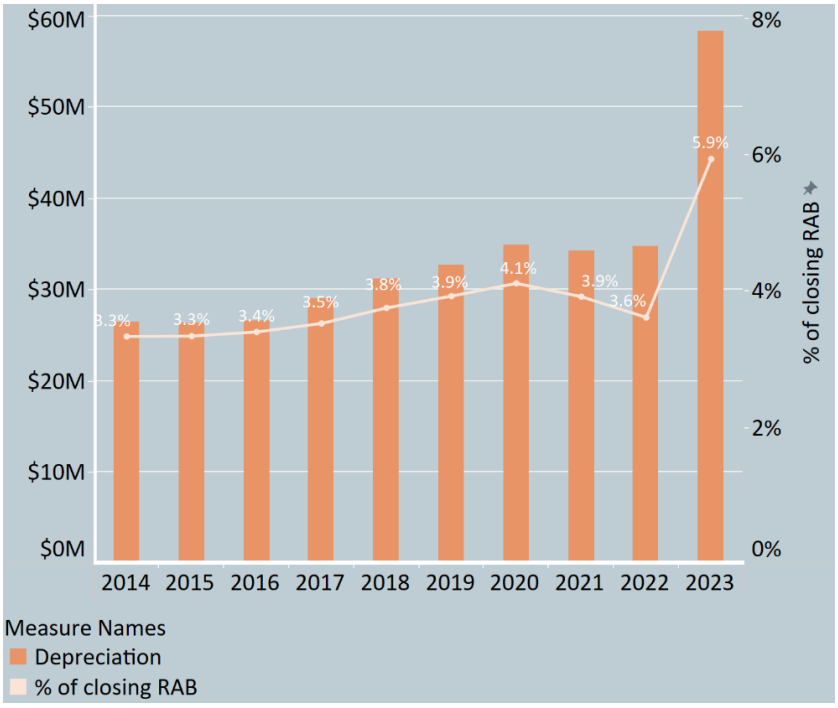
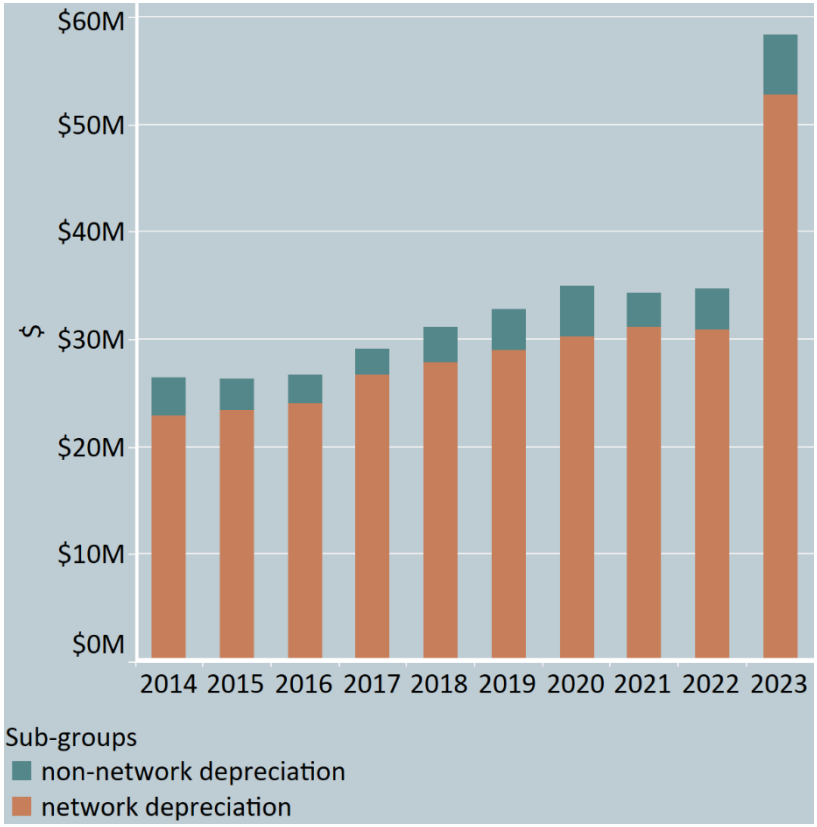


Figure 83: Split of gas transmission businesses' network vs non-network depreciation, 2014-2023

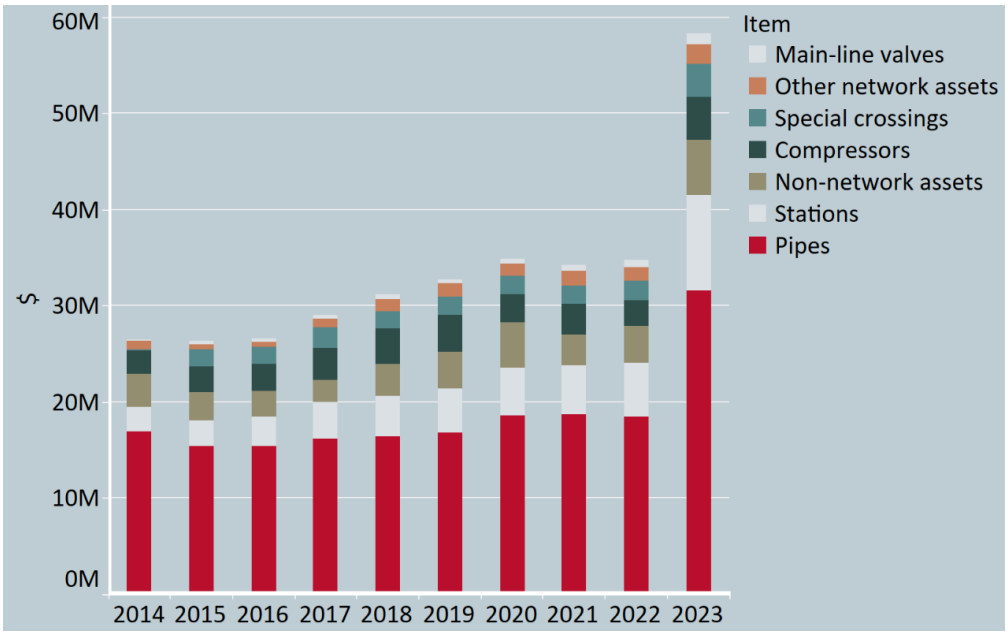


239. Depreciation has grown since 2014, both in absolute terms (by $32 million or 121.2%), and as a proportion of the RAB as the average remaining life of assets is decreasing. Network asset depreciation has increased from $22.9 million to $52.7 million, a $29.8 million increase, or 29.8% in nominal terms, between 2014 and 2023. Non-network depreciation has increased by 60% overall between 2014 and 2023, from $3.5 million in 2014 to $5.6 million in 2023.

240. Under DPP3, we also shortened the asset lives of gas transmission businesses due to the expected long-term decline in demand for gas. The effect of shortened asset lives has seen increased levels of depreciation as evident in 2023. Commissioned capex ultimately flows through to the prices that customers pay for the services of the gas transmission businesses via increases in the value of the RAB (through the commissioning of new assets), and thus depreciation.[38]

241. Figure 84 shows the breakdown of gas transmission businesses' depreciation by asset type between 2014 and 2023.

Figure 84: Breakdown of gas transmission businesses' depreciation by asset type, 2014-2023



242. The majority of depreciation in network assets relates to pipes (55.1%), followed by stations (13.9%), and non-network assets (10.7%) between 2014 and 2023.

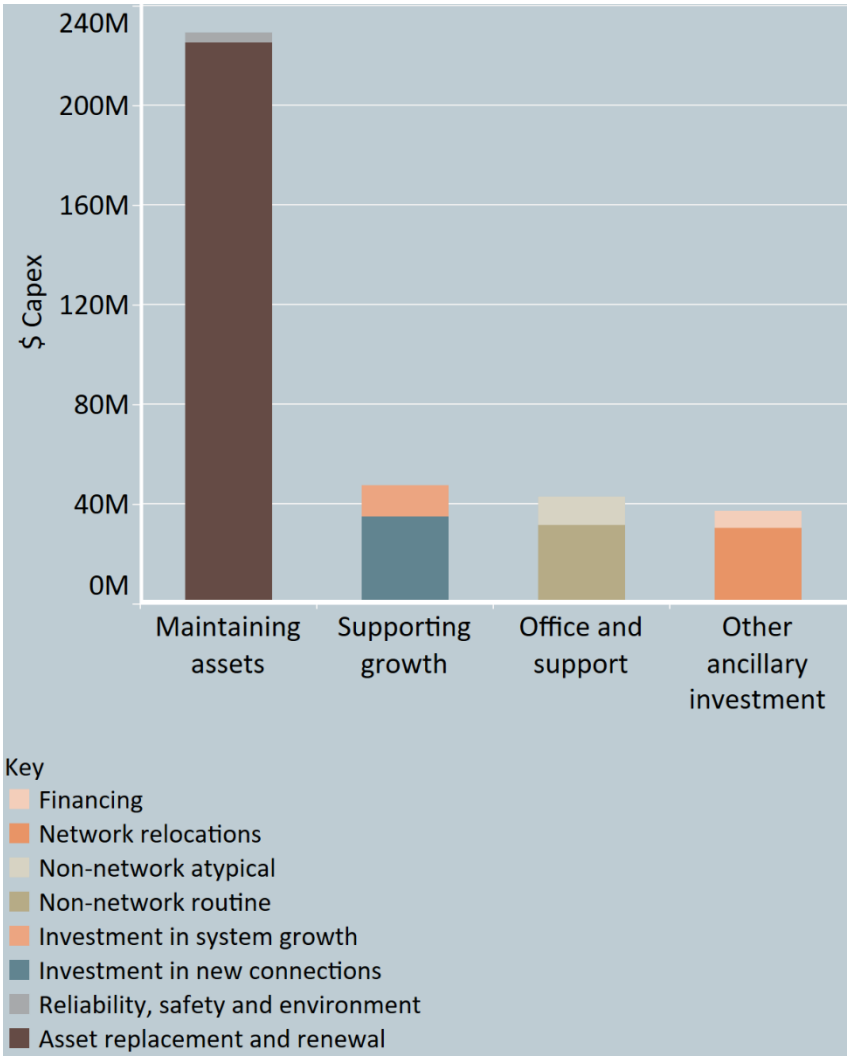
[38] Increases in the value of the RAB, depreciation and opex allowances, factors into the setting of the maximum allowable revenue of gas transmission businesses.

Depreciation across all types of network assets has increased since 2014 but is the largest in absolute terms for pipes and stations, which have increased by $14.7 million and $7.4 million respectively since 2014.[39]

Gas transmission pipeline investment has been focused on maintaining assets

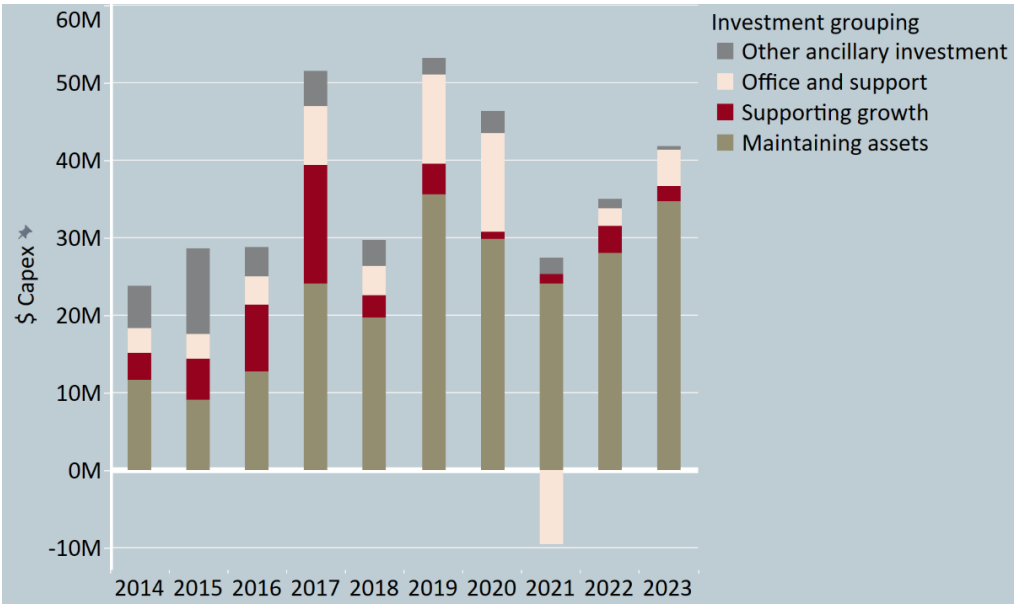
243. Gas transmission businesses' capex programmes have mainly focussed on the 'maintaining assets' category. Figure 85 shows the total capex by investment type for gas transmission between 2014 and 2023, while Figure 86 shows the capex by high-level investment category as a time series between 2014 and 2023.

Figure 85: Gas transmission businesses' total capex by investment type between 2014 and 2023



244. 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 $229.2 million since 2014. 'Supporting growth' is the next largest category of capex, totalling $47.3 million since 2014.

Figure 86: Gas transmission businesses' capex by high-level investment category, 2014-2023

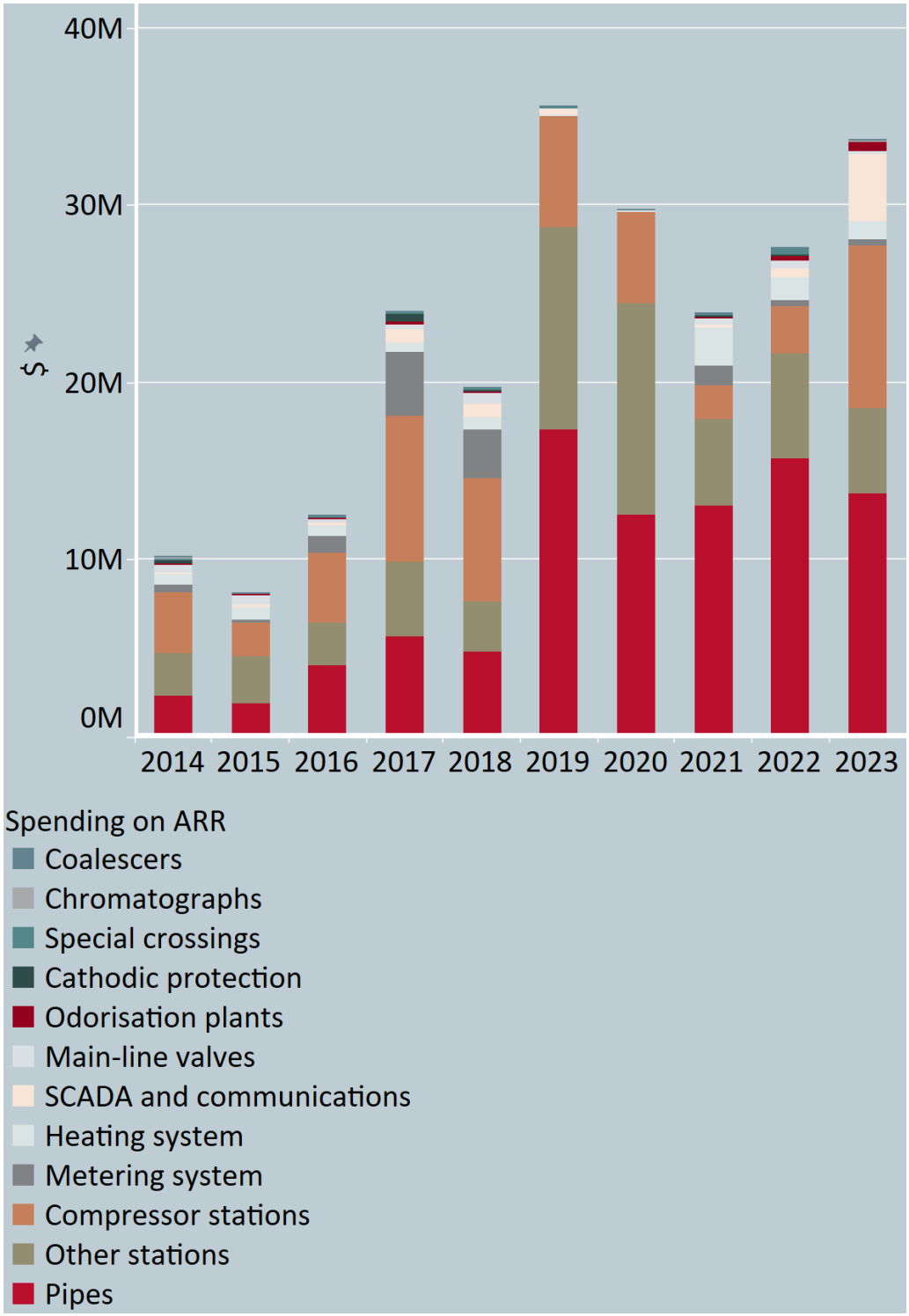


245. 'Maintaining assets' was the largest area of growth in capex, with an increase of $23.1 million since 2014. Office and support are another area of capex growth, increasing by $1.5 million since 2014. Spending on other ancillary investment decreased by $5 million, while spending on supporting growth decreased by $1.7 million 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

246. 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 2023 in more detail.

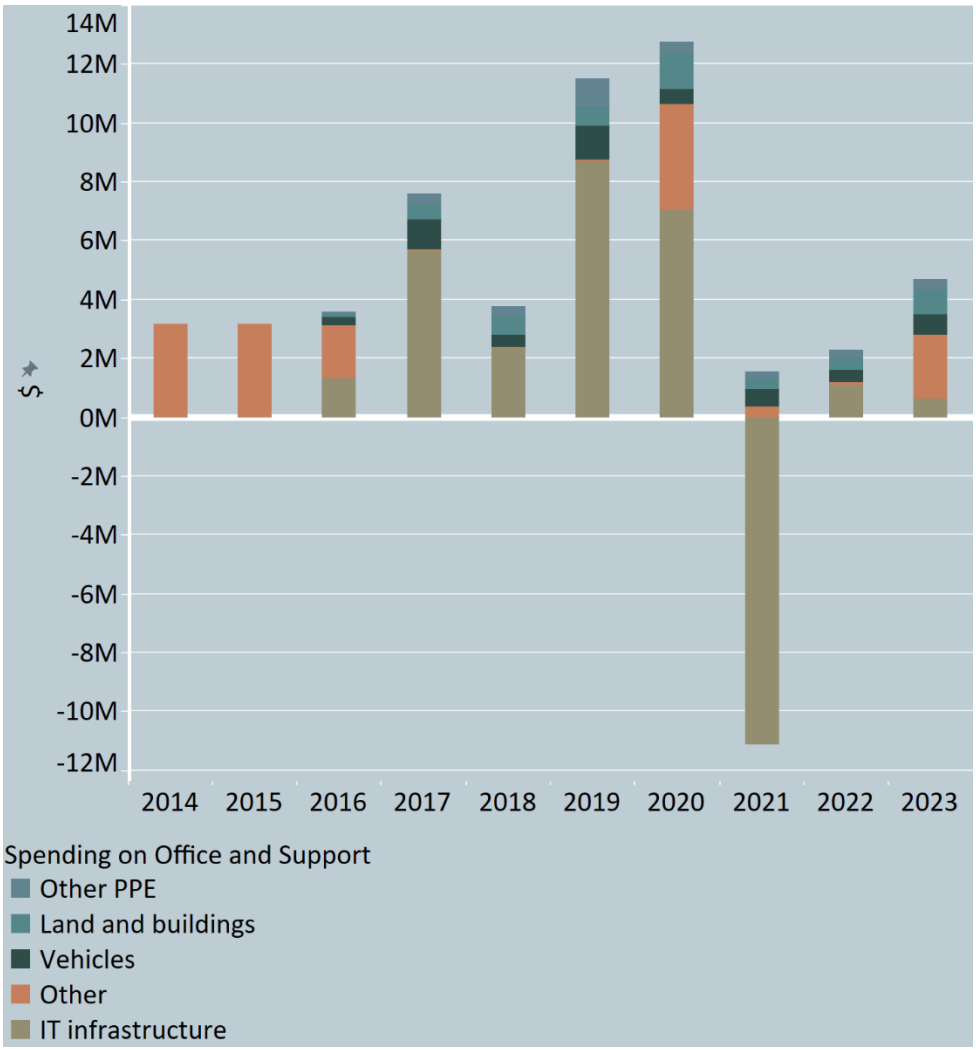
Figure 87: Breakdown of gas transmission businesses' investment in asset replacement and renewal, 2014-2023



247. Pipes, other stations, and compressor stations typically see the most asset replacement and renewal (ARR) capex, and capex across these assets has grown by $11.4 million, $2.4 million and $5.6 million 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]

248. Figure 88 shows the capex in the 'office and support' category between 2014 and 2023.

Figure 88: Breakdown of gas transmission businesses' office and support capex, 2014-2023



249. Office and support capex had been low prior to the acquisition of the two transmission systems by FirstGas, at roughly $3 million per year between 2014 and

[40] FirstGas "Asset Management Plan Update 2019", pages 22 and 30.

2016. However, this increased markedly, by $9 million 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 was developed, changed in 2016. Changes in the external environment, coupled with technical and design challenges, led FirstGas to permanently discontinue the project in 2021.[41] This resulted in a negative capex for IT infrastructure, reflecting the write-off of the GTAC assets. In 2022 and 2023, FirstGas' office and support capex moved back into positive range with IT infrastructure and 'other' being the largest components of this area of capex.

250. Also of note, is a change to accounting standards that came into effect in 2019, which bought capitalised leases (also described as "right of use" assets) into the "other" category of assets. The costs associated with these capitalised leases, historically classed as 'business support' opex, were recorded as depreciation of the capitalised leases in 2021 (at $0.3 million).

Supporting growth capex and other ancillary investments have been sporadic and declined over the last ten years

251. 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 2023, while figure 90 shows 'other ancillary investment' for gas transmission between 2014 and 2023.

[41] FirstGas "Gas Transmission Business Asset Management Plan Update – Year commencing 1 October 2021", page 34.

Figure 89: Gas transmission businesses' supporting growth capex, 2014-2023

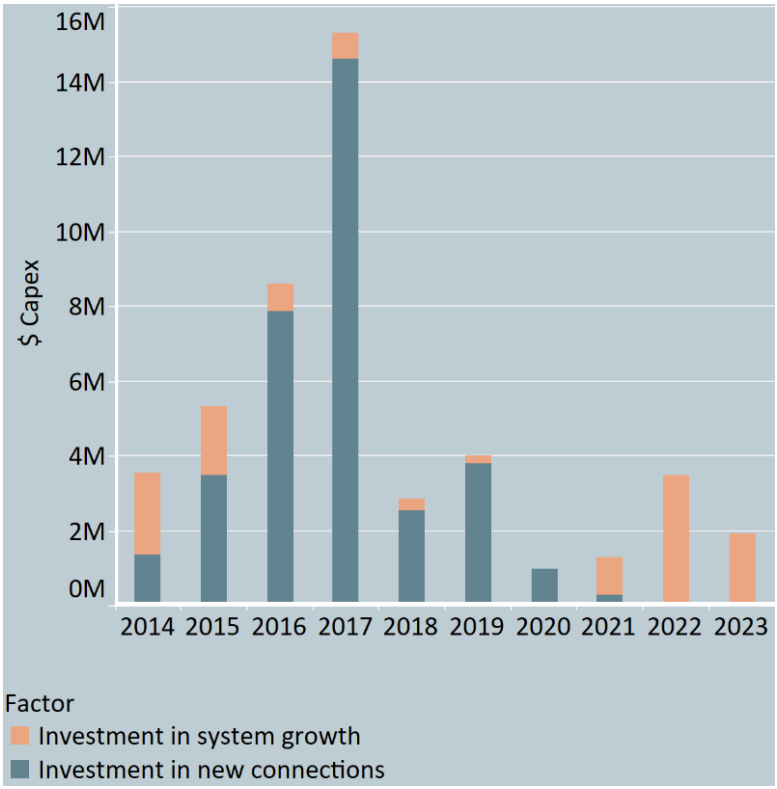
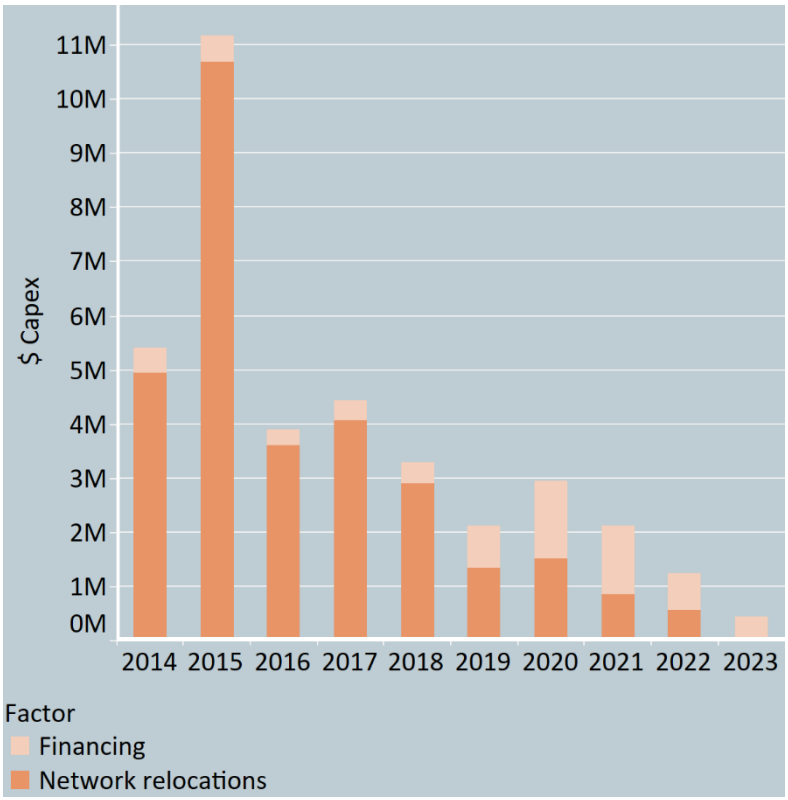


Figure 90: Gas transmission businesses' other ancillary investment, 2014-2023



252. The majority of ‘supporting growth’ projects are associated with new or increased customer connection requirements between 2015 and 2020. However, in 2021, system growth investment made up the majority of supporting growth capex. In 2022 and 2023, investment in system growth made up all of FirstGas’ supporting growth capex. The 2017 peak was from commissioning a new delivery point at Marsden Point, and the rebuild of a compressor station in Henderson to meet New Zealand Refining’s requirement for greater gas volumes, which cost $10 million alone.

253. ‘Other ancillary investment’ is similarly driven by network relocation capex, and 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 2023 was associated with transport construction projects.

Customer contributions, investment in new connections and spending on asset relocations have generally decreased over time

254. The customer contributions to gas transmission businesses are determined by their capital contribution policy. There are two types of customer contributions, one for connections and another for relocation of assets.

255. Figures 91 and 92 show the proportion of new connections, and network relocation capex provided for by these capital contributions between 2014 and 2023.

Figure 91: Customer contributions to new connections, 2014-2023[42]

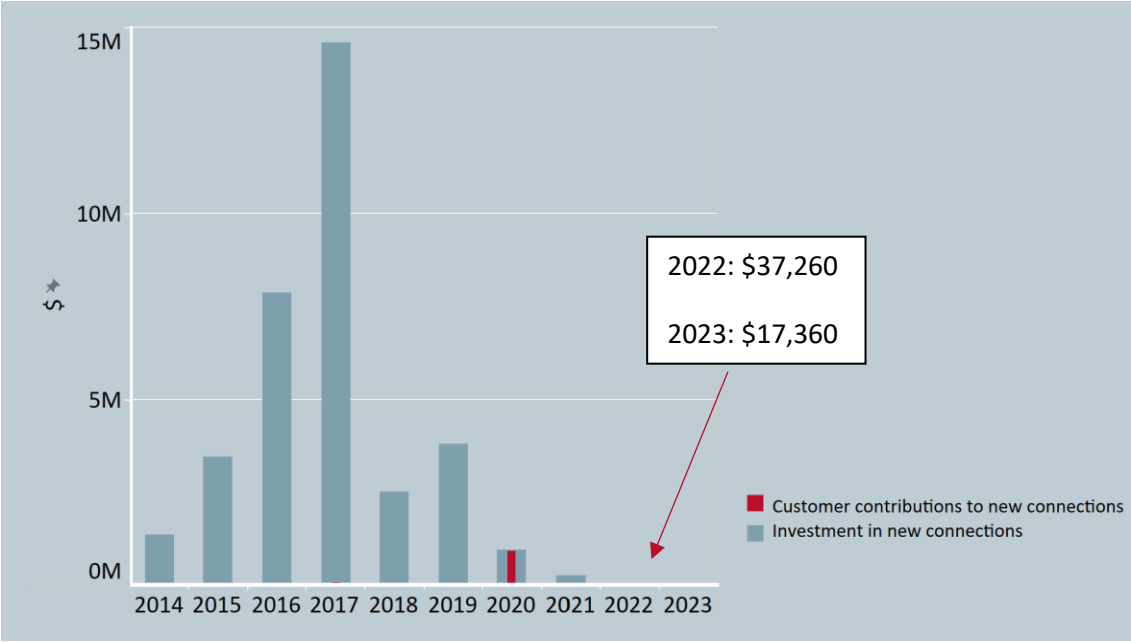
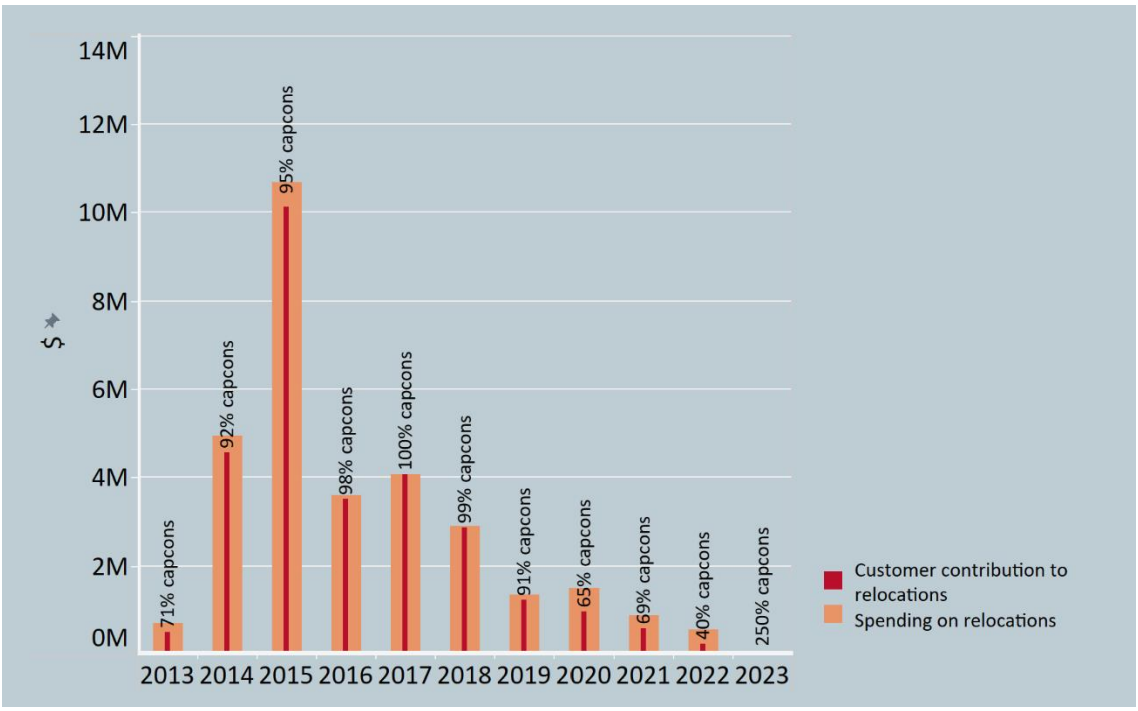


Figure 92: Proportion of gas transmission businesses' network relocation capex funded by capital contributions, 2014-2023



[42] Customer contributions to new connections was not show before 2020 because these contributions were so small that they could not be displayed on the graph.

256. Historically, different capital contribution policies existed for each of the high-pressure transmission pipeline systems. These policies were amended when FirstGas purchased the transmission system and replaced both policies with a single policy.

257. Customer contributions to new connections and asset relocations have fluctuated, and generally decreased over time between 2014 and 2023. In 2022 and 2023, customer contribution to new connections were very low at $37,260 and $17,360, respectively (as indicated in Figure 92).

The cost of operating gas transmission businesses has averaged $47.4 million per year between 2014 and 2023

258. Between 2014 and 2023, gas transmission businesses' opex has increased by $18.8 million, from $40.7 million to $59.5 million. 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, e.g., 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, e.g., control centre and network planning activities

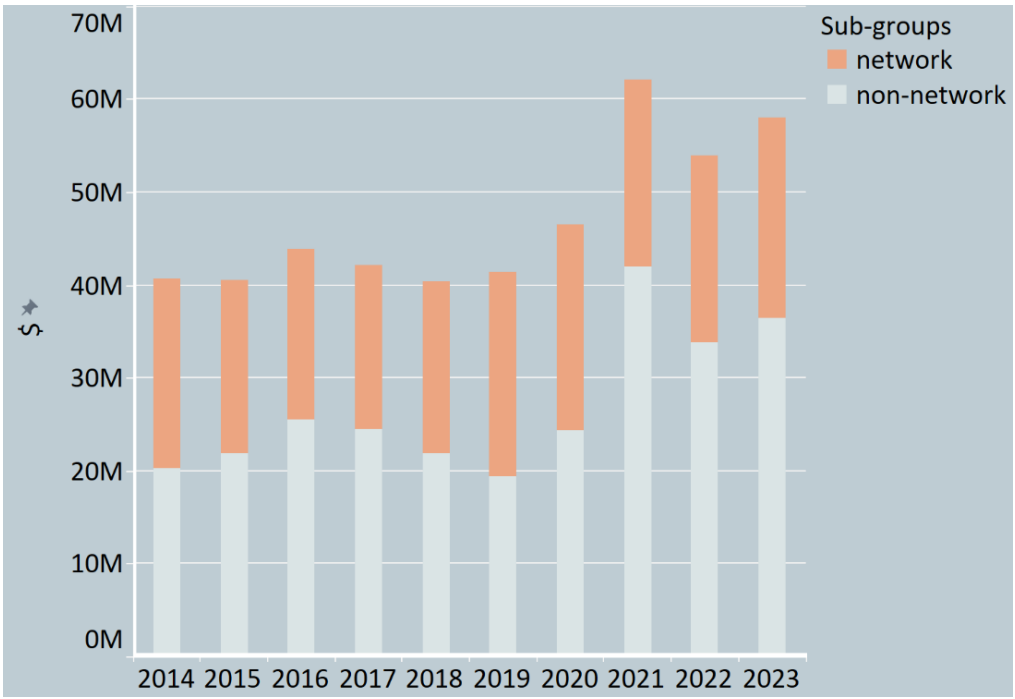
[43] As of the regulatory period beginning 1 October 2017, FirstGas has been able to treat compressor fuel costs associated with the Mokau compressor as a recoverable cost, due to it often acting as a substitute to balancing gas activities on the Maui pipeline (the cost of which is recoverable and was recoverable prior to 1 October 2017).

Business support	Non-network	Administration or opex that is not directly incurred in the physical operation and maintenance of the network, e.g., 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 70% of gas transmission business operating costs between 2014 and 2023

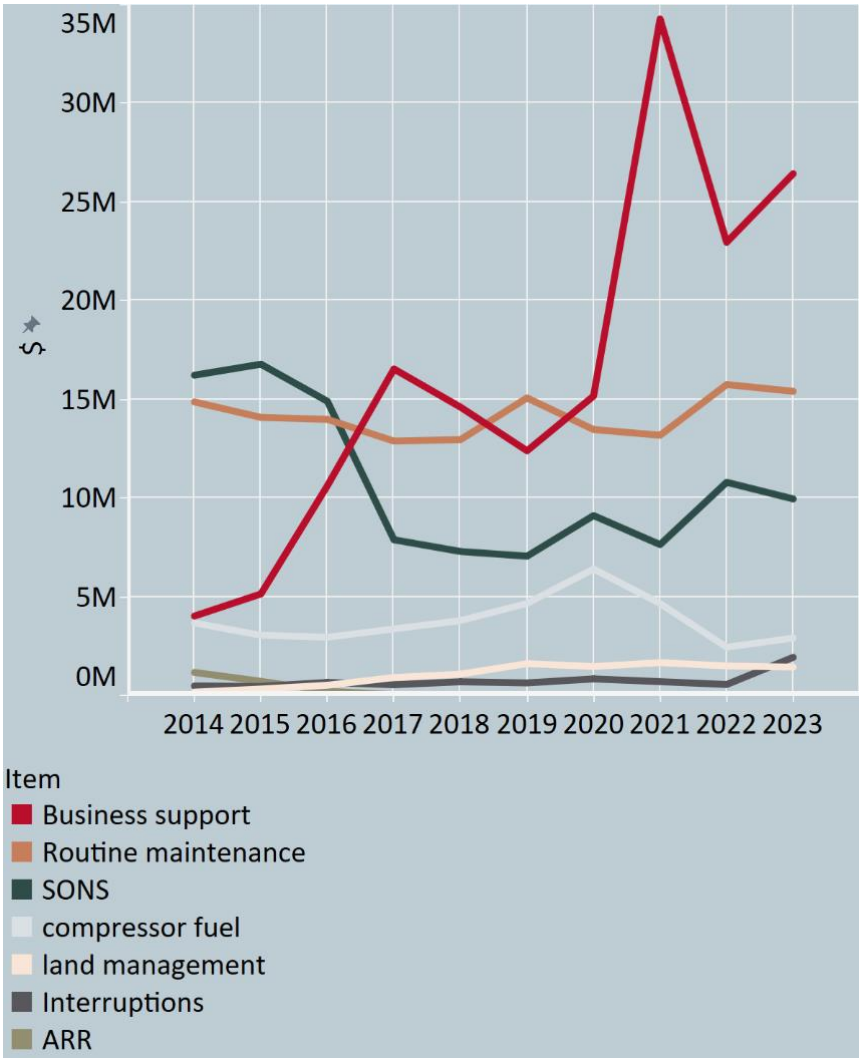
259. The gas transmission operating costs of non-network activities have generally been larger than the operating costs associated with network activities, during the period between 2014 and 2023. There was a larger increase in the split between non-network and network costs in 2021, primarily due to the discontinuation of the GTAC project, and the accounting reclassification of software as a service (**SaaS**) from non-network capex, to opex. Figure 93 shows the split of gas transmission businesses' network, and non-network opex between 2014 and 2023.

Figure 93: Split of gas transmission businesses' network vs non-network opex, 2014-2023



260. Non-network opex accounted for 70.1% of total opex between 2014 and 2021 and has been increasing by 6.1% per year on average, with the largest increase occurring from the 2020 to 2021 year. Network opex averaged $20.0 million from 2014 to 2023 with small fluctuations year-on-year. Figure 94 shows the breakdown of gas transmission businesses' opex by expenditure category between 2014 and 2023.

Figure 94: Gas transmission businesses' opex by expenditure category, 2014-2023



261. Business support opex was the largest component of opex by gas transmission businesses over the period from 2014 to 2023, accounting for $162.1 million, or 34.5%, of opex. The second largest component of opex during this period was routine maintenance, which cost $141.9 million, or 30.2%, of opex. System operations and network support (**SONS**) was the third largest component of opex, costing $107.7 million, or 22.9%, of opex during this period.

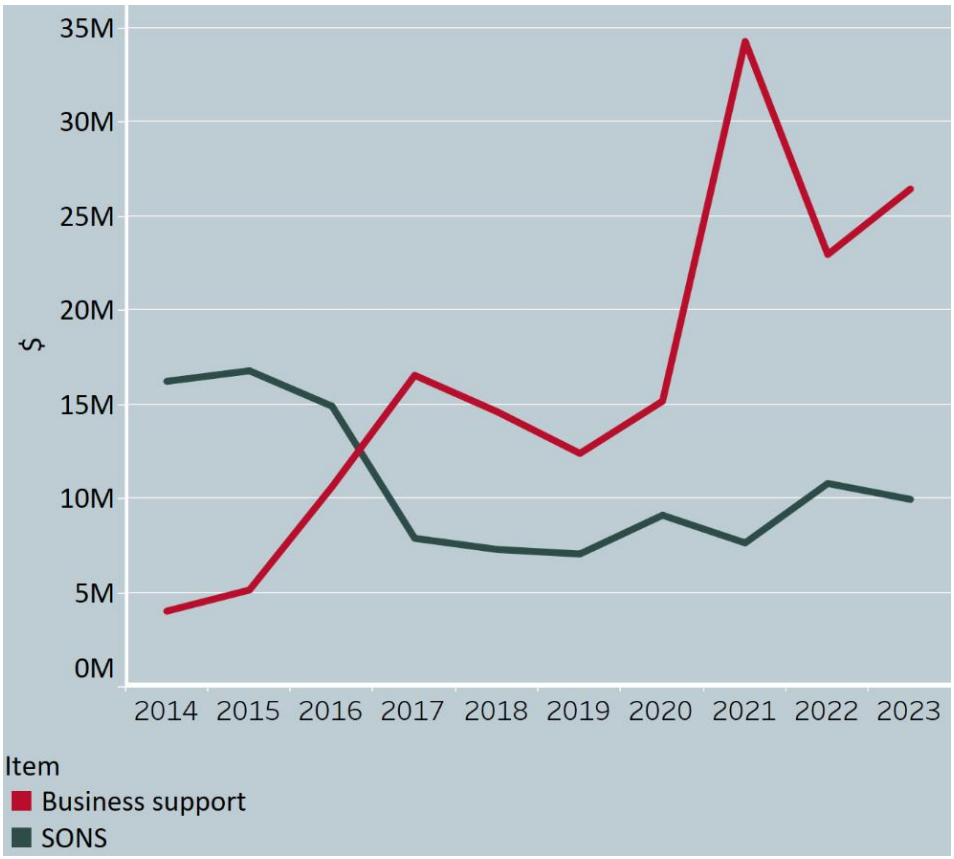
262. Over the period of 2014 to 2020, routine maintenance was the largest component of opex by gas transmission businesses, accounting for $98 million. In 2021, business support opex overtook routine maintenance as the largest opex category, due to the GTAC project assets write offs.

263. 'System operations and network support' expenditure was the largest between 2014 and 2016 but decreased in 2017 through FirstGas' re-categorisation of network support costs as 'business support' opex, following its acquisition of both transmission pipeline systems.

Business support opex has trended up between 2014 and 2023 while system operations and network support opex have trended down during this period

264. Due to the re-categorisation of opex costs between 'business support' and 'system operations and network support' in 2017, it is helpful to view these trends together. Figure 95 shows gas transmission businesses' 'business support' and 'system operations and network support' opex, between 2014 and 2023.

Figure 95: Gas transmission businesses' business support opex and system operations and network support opex, 2014-2023



265. Business support opex had increased by $22.4 million between 2014 and 2013, while SONS opex had decreased by $6.2 million over the same period. 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. Business support opex increased in 2021, due to the write-off of the GTAC project assets. In 2022, business support opex dropped by around $10 million before increasing slightly in 2023. SONS opex has overall trended downwards over time between 2014 and 2023, with less fluctuation than business support opex.

There have been more unplanned interruptions than planned interruptions for gas transmission businesses between 2018 and 2023

266. Between 2018 and 2023, there have been more unplanned interruptions for gas transmission businesses, than planned interruptions. The number of incidents has fluctuated over this period with a slightly higher number in 2023 than in 2018.

267. Interruptions of gas transmission services have the potential to significantly impact many customers. FirstGas is subject to two sets of regulation relating to service quality standards:

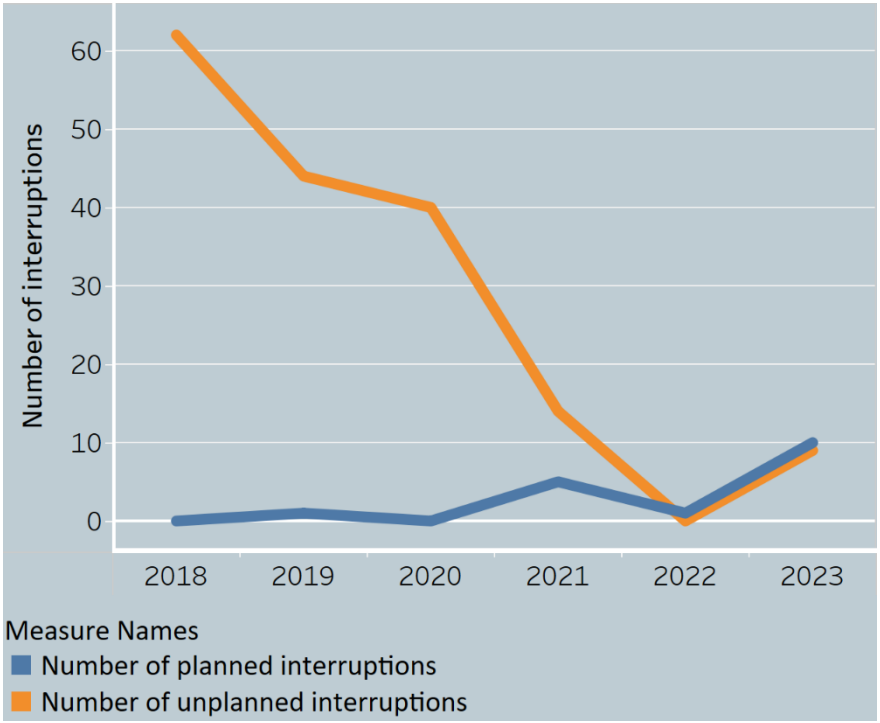
    267.1 The Gas Governance (Critical Contingency Management) Regulations 2008 sets out the arrangements for the transmission system owner (**TSO** (FirstGas)) to respond to serious emergencies. Under these regulations, the TSO must create a Critical Contingency Management Plan (**CCMP**) that is approved by the GIC. The CCMP includes the types of events that may result in a breach of a Critical Contingency threshold (i.e., 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".[44]

    267.2 Under PQ regulation of gas transmission services, there must be no major interruptions, where major interruptions are breaches of a Critical Contingency threshold that result in demand curtailment directions being issued.[45]

268. Figure 96 shows the number of planned and unplanned interruptions for gas transmission businesses between 2018 and 2023.

[44] Critical Contingency Operator "Firstgas Critical Contingency Management Plan", page 54.
[45] *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 customers (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.

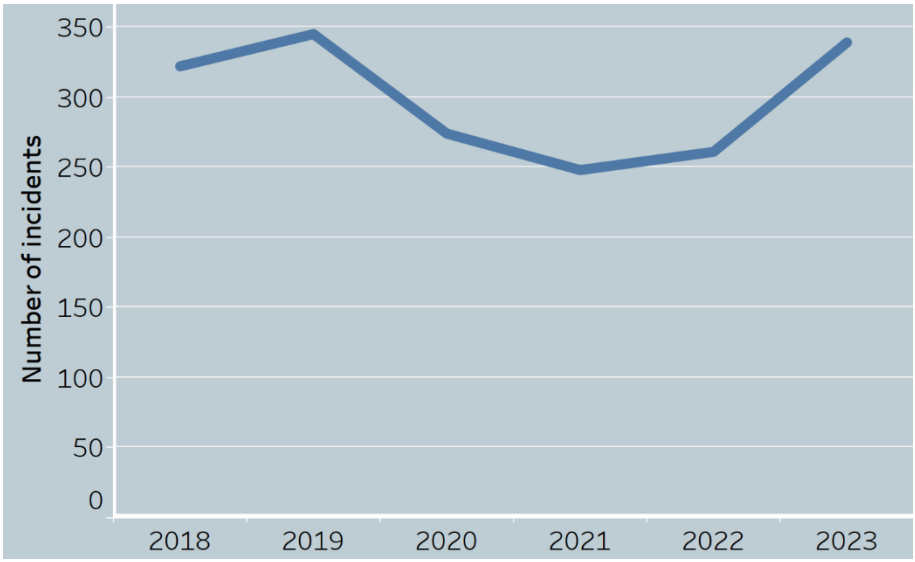
Figure 96: Interruptions for gas transmission businesses (planned and unplanned), 2018-2023



269. The number of planned interruptions has remained relatively low but has generally trended upwards between 2018 and 2023. The number of unplanned interruptions has generally trended down between 2018 and 2023.

270. Figure 97 shows the number of incidents of gas transmission businesses between 2018 and 2023.

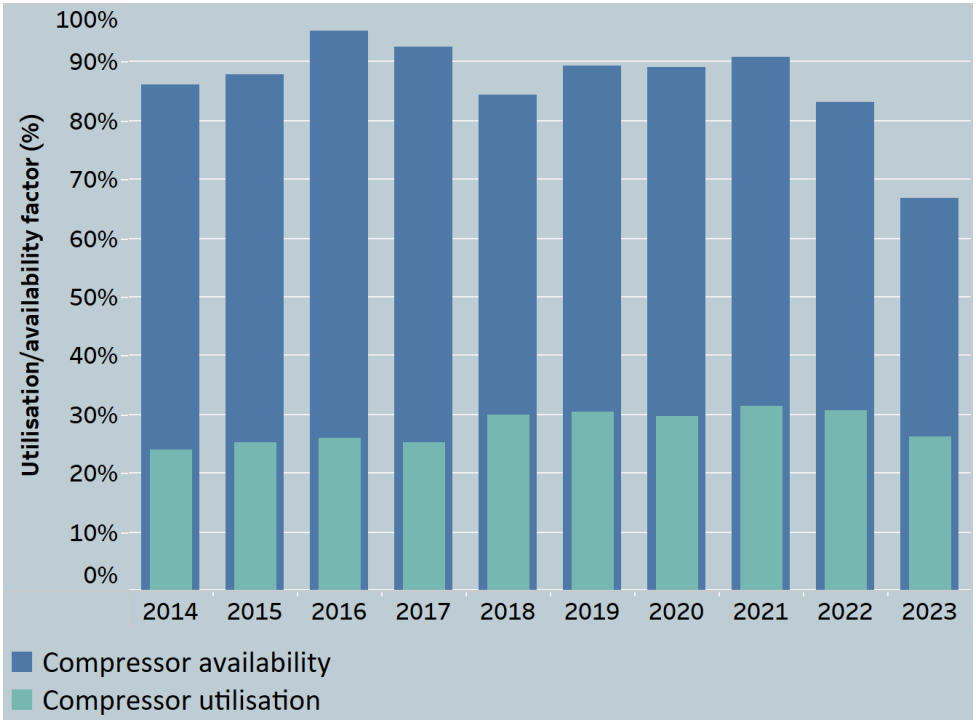
Figure 97: Number of incidents of gas transmission businesses, 2018-2023



271. The number of incidents of gas transmission businesses have fluctuated between 2018 and 2023. The number of incidents reached a high of 345 incidents in 2019, before decreasing to 248 incidents in 2021. The number of incidents increased from 2021 onwards, reaching 339 incidents in 2023.

Compressor utilisation has been relatively steady over time

Figure 98: Average compressor unit utilisation and availability for gas transmission businesses, 2014-2023



272. The average availability of all compressor units is generally high, sitting close to 90% between 2014 and 2021. However, in the past two years, compressor unit availability has dropped from 91% in 2021 to 83% in 2022, and 67% in 2023. Average availability was high in 2017 with the commissioning of the Henderson compressor station to meet New Zealand Refining's requirement for greater gas volumes. Average utilisation has fluctuated between 24% and 31% between 2014 and 2023. Average compressor utilisation rate was 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 until 2022 and dropped down to 26% in 2023.

273. Figure 99 shows the total number of times a compressor unit failed to start between 2014 and 2023, while Figure 100 shows the total number of instances in which a compressor unit was unavailable when required, between 2014 and 2023.

Figure 99: Total number of times a compressor unit failed to start, 2014-2023

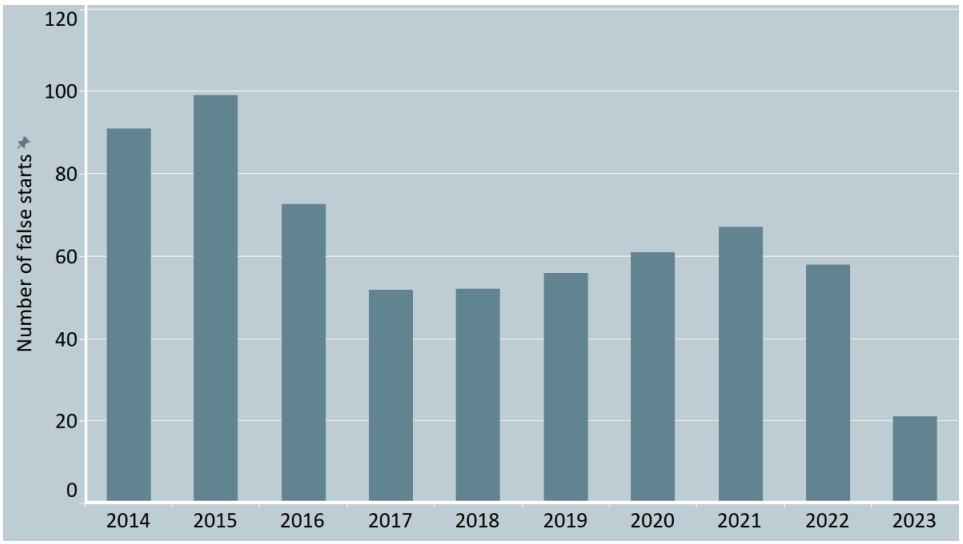
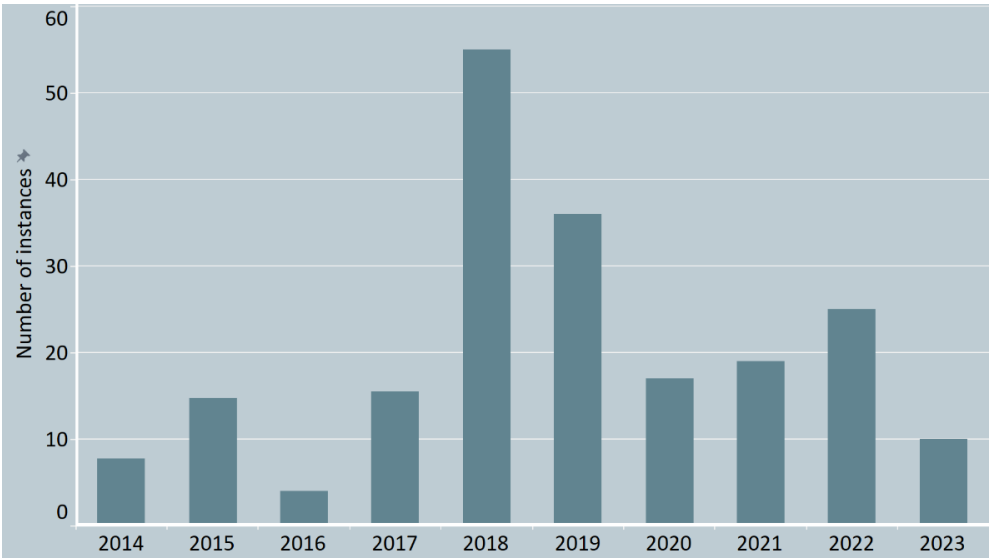


Figure 100: Total number of instances in which a compressor unit was unavailable when required, 2014-2023



274. Compressor reliability in terms of failed starts has improved between 2014 and 2023. Between 2018 and 2021, there was a slow rise in the number of failed starts for compressor units. The compressor units in Kaitoke (near Whanganui) were responsible for most of the failed starts until 2018. The Kaitoke compressors run as required, rather than continuously. These compressors play a critical part in delivering gas supply to Wellington in winter and had control and cooling systems upgrades undertaken over several years, which were completed in 2018 and 2019 respectively.

275. The number of instances of compressors being unavailable has fluctuated between 2014 and 2023, with a slight increase for the overall trend. Compressor unavailability increased significantly in 2018, but has been generally decreasing since then, despite slight upticks in 2021 and 2022. The Henderson and Mokau compressor stations have been responsible for most of these instances of unavailability.

276. The slight improvement in 2019 was due to the Mokau compressors becoming more reliable following project works (the Mokau compressors also had fewer instances of unavailability in 2020). The Henderson compressor units (which came online in 2017) are the only ones in FirstGas' 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.

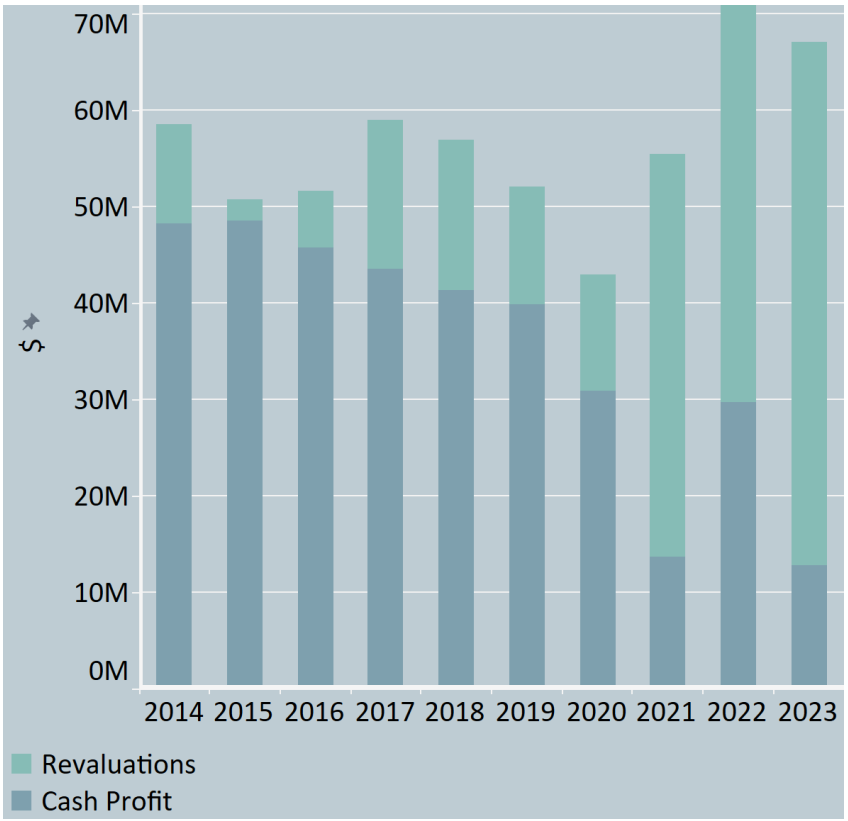
277. In 2021, there were a higher number of electrical supply issues for the Henderson compressor, resulting in the slight uptick in instances of compressors being unavailable when required. FirstGas is investigating options for backup power supply to the Henderson compressor, in the event of electricity network interruptions, which have historically been common in this network area.

278. In 2022, the number of instances when a compressor unit was required but unavailable, increased to 25 instances from 19 instances in 2021, primarily due to a higher number of electrical supply issues for the Kaitoke compressors.

Gas transmission businesses' regulatory profit has increased by $8.5 million between 2014 and 2023

279. Gas transmission businesses made $67.1 million in regulatory profit in 2023, made up of $12.8 million in cash profit, and $54.3 million in asset revaluations. Figure 101 shows the trend in cash profit after tax, and revaluations for gas transmission businesses between 2014 and 2023.

Figure 101: Gas transmission businesses' total regulatory profit after tax, 2014-2023



280. Regulatory profit increased significantly in 2021 and 2022, with a small decline in 2023. Higher rates of inflation have driven up the value of the regulated asset base of gas transmission businesses, which accounted for the majority of the higher levels of regulatory profit.

281. Cash profit has been decreasing steadily since 2014, by $35.5 million over the ten years to 2023. 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 $44 million since 2014, with the largest amounts for revaluations in 2021 to 2023 arising from higher inflation.

282. Cash profits have decreased 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. This was reflected 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 local gas pipeline businesses were fairly compensated for their investments.

283. 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 shows that inflation in 2021 to 2023 was high, which drove the increase in asset revaluations.

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

284. 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 (i.e., profit beyond what they would be expected to earn if they were fairly compensated for their investments).

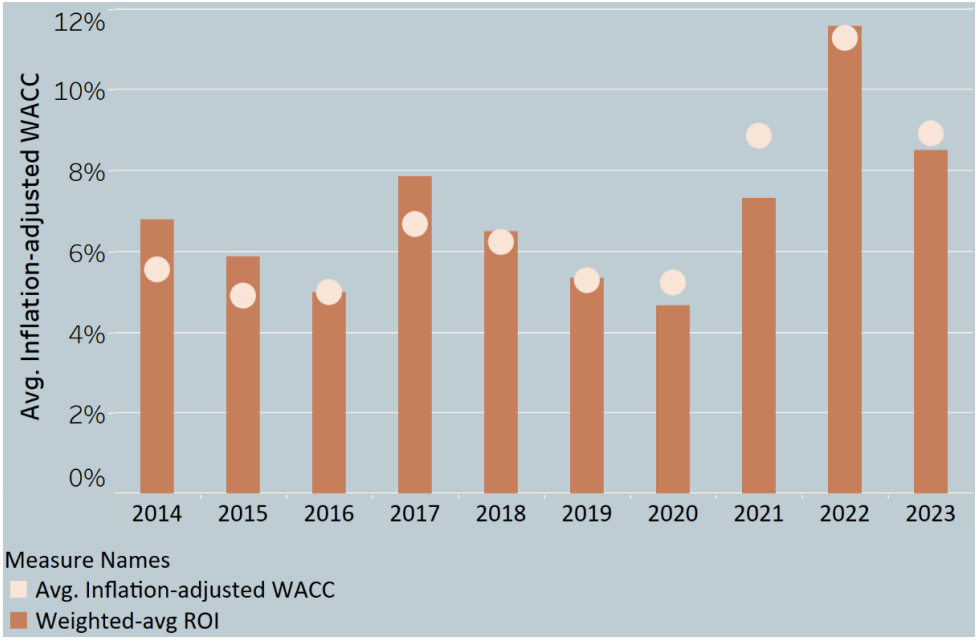
285. Figure 102 shows:

285.1 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 2023, and

285.2 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.

286. 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 102: Gas transmission businesses' return on investment vs post-tax WACC adjusted for ex-post inflation, 2014-2023



287. The return on investment for gas transmission businesses has generally been in line with the ex-post estimate of their cost to invest. In 2022, FirstGas Transmission's return on investment was 11.93% which was a significant increase compared to its 2021 ROI of 7.58%. This increase in 2022 was primarily due to the significant increase in inflation in 2022, when the CPI was 7.23%, compared to 4.93% in 2021. In 2023, FirstGas Transmission's ROI was 9.15%, a decrease compared to their 2022 ROI. The decrease of the 2023 ROI was primarily due to the shortened asset lives leading to accelerated depreciation, which offset the high CPI being applied to revaluations.

288. Our estimate of the WACC we used to set price-quality paths for gas transmission businesses was 6.77% after tax, for the 2013 to 2017 disclosure years, 5.85% for the 2018 to 2022 disclosure years, and 5.67% for the 2023 to 2026 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 than the inflation used in setting the 2017-2022 DPP, resulting in adjusted WACC figures between 5.25% and 8.76%. In 2023, the adjusted WACC was 9%. Overall, returns were generally in line with these

levels, suggesting that gas transmission businesses have generally not made excessive returns over the last ten 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
ROI	Return on investment
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