Gas asset management plan

2023

POWERco

Foreword from our CEO

Kia ora koutou

Aotearoa New Zealand's target of net zero carbon emissions by 2050 is driving both opportunities and challenges for us, and a lot of work has gone into thinking about our strategy as part of the energy transition. Our strategy is to enable a truly sustainable transition – one that is affordable, resilient, reliable, low carbon, and productive – leveraging Aotearoa's energy resources to 'grow to zero'. We believe Aotearoa is well placed to grow its economy while reaching its net zero 2050 target.

Our 2023 Asset Management Plan is a significantly revised plan, reflecting changes in our operating environment since our last full AMP in 2020. We are forecasting a period of transition, where new connection numbers, network growth, and the overall demand for gas reduces. Demand for gas from industrial and large commercial customers is reducing, and will continue to reduce, with this sector a priority for emissions reduction. This sector accounts for less than 1% of gas connections in Aotearoa New Zealand, but produces more than 95% of the emissions from the related gas demand. On the other hand, demand from residential andsmaller commercial customers (driving less than 5% of emissions), is expected to remain steady while the complexities of enabling a sustainable transition are worked through.

Our gas network provides a critical lifeline service to many households and businesses and will be relied on as part of the overall energy system for a long time to come. We see an opportunity for a sustainable transition to renewable gas. This is a significant opportunity for our customers and for a growing energy sector and economy. Our customers can take comfort that we are working to keep the optionality and resilience they have today for the future. We see the role of gas as fundamental, not only in helping Aotearoa New Zealand meet its target of net zero emissions by 2050, but also in maintaining the resilience of our energy system and contributing to a growing economy. The Gas Transition Plan Issues Paper, released in August 2023, confirms the pathway to reduce reliance on natural gas, with a critical role for gas (including both biogas and hydrogen) to ensure a truly sustainable transition.

We are already seeing the effects of climate change, with more frequent severe weather events causing significant damage to infrastructure and interrupting electricity supply. While maintaining resilience and reliability is high on the agenda for all utilities, these events also highlight the community value from the resilience of multiple energy sources, including our gas networks. When recent cyclone events (Dovi and Gabrielle) damaged infrastructure and disrupted power supplies across the country, the gas network remained intact and continued to supply communities. Gas customers were able to cook their food, heat their home and have hot water.

We're excited and confident about sustainable and resilient energy options for our communities. This 2023 Asset Management Plan reflects our vision to proudly play our part delivering it.

Ngā mihi nui

James Kilty
Chief Executive Officer

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1. Executive summary

1.1 Introduction to our 2023 AMP

Since we published our last full AMP in 2020, there have been considerable changes within our operating environment that are reshaping the energy landscape. Key to this is New Zealand's first Emissions Reduction Plan, published in May 2022, which signalled significant implications for the gas sector. We are working to adjust our strategies and plans to align with the Emissions Reduction Plan, which sets a pathway to reduce the reliance of fossil gas in New Zealand and increase access to low-emissions fuels.

New Zealand is well positioned to tackle emissions in the energy and industry sectors because of our high levels of renewable electricity. However, more than 60% of New Zealand's energy supply still comes from non-renewable sources. Gas typically contributes 20-25% of primary energy supply and is an essential fuel and feedstock for the petrochemical industry and electricity generation. More than 400,000 households and businesses in New Zealand rely on gas (natural gas and LPG), therefore gas has a key role in the transition to a low carbon future.

The foundation of our strategy is to mitigate and adapt to the challenges presented by climate change. By building a more sustainable gas network, supporting electrification where it is sensible, and delivering lower emissions renewable gas, we can ensure that households and businesses continue to enjoy the benefits of gas while maintaining the important role of gas in delivering a resilient energy system for Aotearoa New Zealand.

We're 100% behind a zero carbon future for Aotearoa. To get there, New Zealand will need a mix of energy options that includes low and zero carbon gases.

Our gas network provides a critical lifeline service to many households and businesses across the North Island of New Zealand. As long-term stewards of the network assets, our aim is to deliver a better energy future to our customers by providing a safe, reliable, resilient, and cost-effective gas distribution network now and into the future.

It's great to have optionality when it comes to powering the motu. We are already seeing the effects of climate change through more frequent severe weather events causing significant damage to infrastructure and interrupting electricity supply. These events also highlight the resilience of gas networks. When recent cyclones Dovi and Gabrielle damaged infrastructure and disrupted power supplies across the country, the gas network remained intact and continued to supply homes and businesses. Gas customers were able to cook their food, heat their home and have hot water.

As renewable gas is introduced into our gas network, our customers can rest at ease knowing that the optionality and resilience they have today will continue to be there in the future. Our work in supporting the development of New Zealand's Gas Transition Plan has reinforced our belief that delivering renewable gas to households and businesses is in the best interest of New Zealanders.

We are engaging in a number of pilot projects and investigating opportunities to develop partnerships to progress the option of blending hydrogen into gas networks, and in 2022 we commissioned a study to assess the present-day opportunity of biogas on our gas footprint. The study concluded that there is 1.2-1.5PJ of biogas available today on or adjacent to our network. This represents 20-25% of the gas supplied to households and small businesses on our network.

We are establishing partnerships and working through the opportunity assessment to scope and evaluate specific projects with the aim of blending biogas (biomethane) into our networks by 2025, and transitioning 20% of gas supplied to residential and small business to biogas by 2030.

We see the transition to 2050 net zero as presenting significant opportunities, while we also acknowledge the challenge it presents for our gas business if we remain static in our approach. That's why we believe the continued investment and innovation in our gas network assets, alongside the exploration of future gas mix options, will support New Zealand's journey to a net zero energy future.

1.2 A resilient network for the future

Resilience and reliability have always been a focus in relation to our network and gas supply.

In February 2023, Cyclone Gabrielle caused devastation across the North Island, including a significant flooding event in Hawke's Bay. While our pipeline crossing the Ngaruroro River bridge in Napier did sustain damage, being pulled from the supporting structures due to flooding and slash, its integrity was maintained, and gas supply to Napier was not interrupted. All other bridge crossings and underground pipes remained undamaged and there was no loss of gas supply throughout our Hawke's Bay network. Gas supply for cooking and hot water provided an essential lifeline for many Hawke's Bay residents when electricity was not available. Cyclone Gabrielle has reiterated the value of a resilient energy option.

While the current architecture and design of our networks presents a strong basis for reliability and resilience, Cyclone Gabrielle also tested our operational and response capability. Field crews worked in difficult conditions over several days to confirm the integrity and accessibility of our critical network assets, ensuring they remained operational. Our emergency contingency plans supported this process. Our review of performance through Cyclone Gabrielle identified improvement opportunities, and these will be incorporated into future versions of our AMP and our Adaptation Resilience Plan.

1.3 Looking ahead

We forecast a period of transition where new connection numbers, network growth, and the overall demand for gas reduces. Demand for gas from industrial and large commercial customers is reducing and will continue to reduce as this sector executes its plans to reduce emissions.

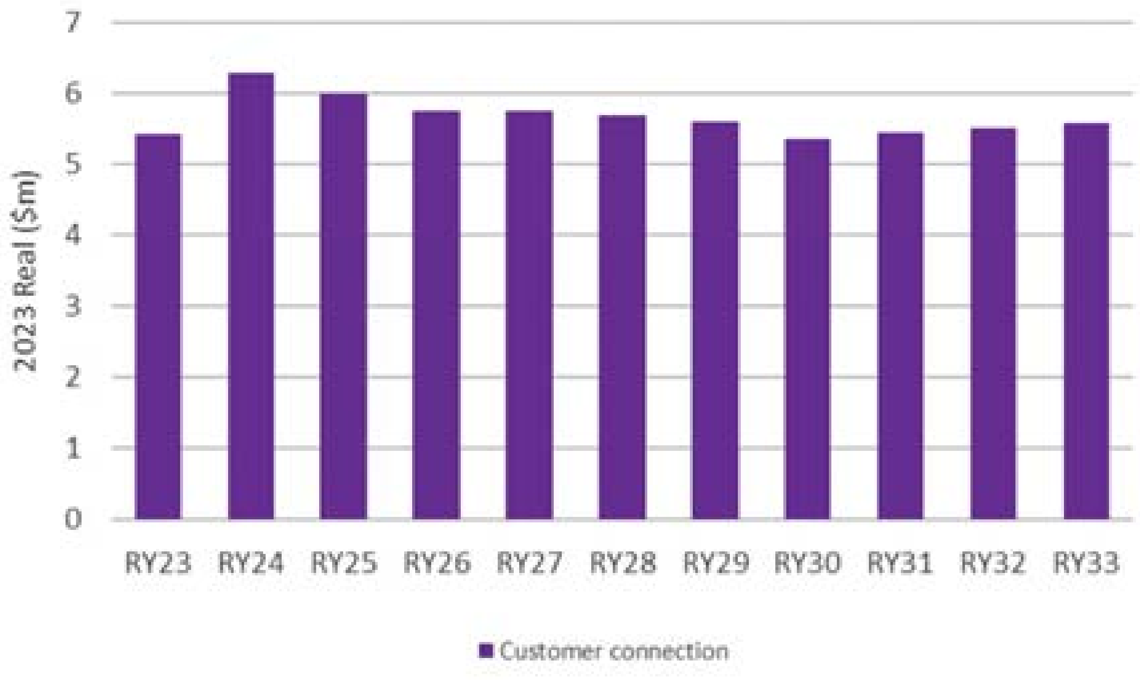
A recent reduction in customer connections and new development is reflective of a slower economy post the 2020-2022 COVID-19 response, and is consistent with a corresponding reduction in building consents. While we expect applications for connections to pick up as the economic situation improves, because of the increasing cost of gas we do not anticipate a return to the growth experienced from 2018-2020.

This results in a corresponding reduction of investment however, this will be largely offset by new investment required to bring on renewable gas, improve resilience and reduce network related emissions.
Key factors influencing future investment include:

- Reducing demand for gas and customer connections.
- Climate mitigation – developing renewable gas and reducing network emissions.
- Climate adaptation and improving resilience.
- Doing our part to reduce Aotearoa's emissions and carbon footprint.
- Optimising investment and operating cost towards future networks.

Our projected customer connection numbers are shown in Figure 1.1. Given the pathway towards a low carbon future is focused on a transition to biogas and hydrogen, we forecast residential connections and disconnections will align to historical averages before the 2018-19 new housing boom and COVID-19, but with a lower consistent growth trend. Commercial gas volumes are forecast to reduce through the transition period to 2050. This scenario has been used as the base case for the detailed AMP planning across this period.

Figure 1.1: Customer connection Capex reflecting the base case scenario for growth



1.4 External forces shaping our network

In Chapter 2 we discuss some of the main external factors we must consider when planning our network. These include:

- New Zealand's first Emissions Reduction Plan.
- Our work associated with the development of The Gas Transition Plan.
- Our renewable pathway that supports the transition to other renewable sources.
- The future of gas and opportunities being investigated to develop partnerships.
- The important role gas plays in supporting New Zealand to meet emissions reduction targets, given the costs associated with transitioning customers to alternative energy sources.
- Our sustainable roadmap to carbon reduction, adaptation, and resilience planning.

These factors have been key considerations in our future work plans and are reflected in our network and asset class strategies and plans.

1.5 Our 10-year expenditure forecasts

Our expenditure forecasts are based on our best current information. This information includes network use and engagement with customers, projected customer trends, and a prudent allowance for readying the network for a transition towards a renewable energy future. Preparing ourselves for managing risk associated with climate adaptation, resilience, and mitigation of emissions is also a key consideration.

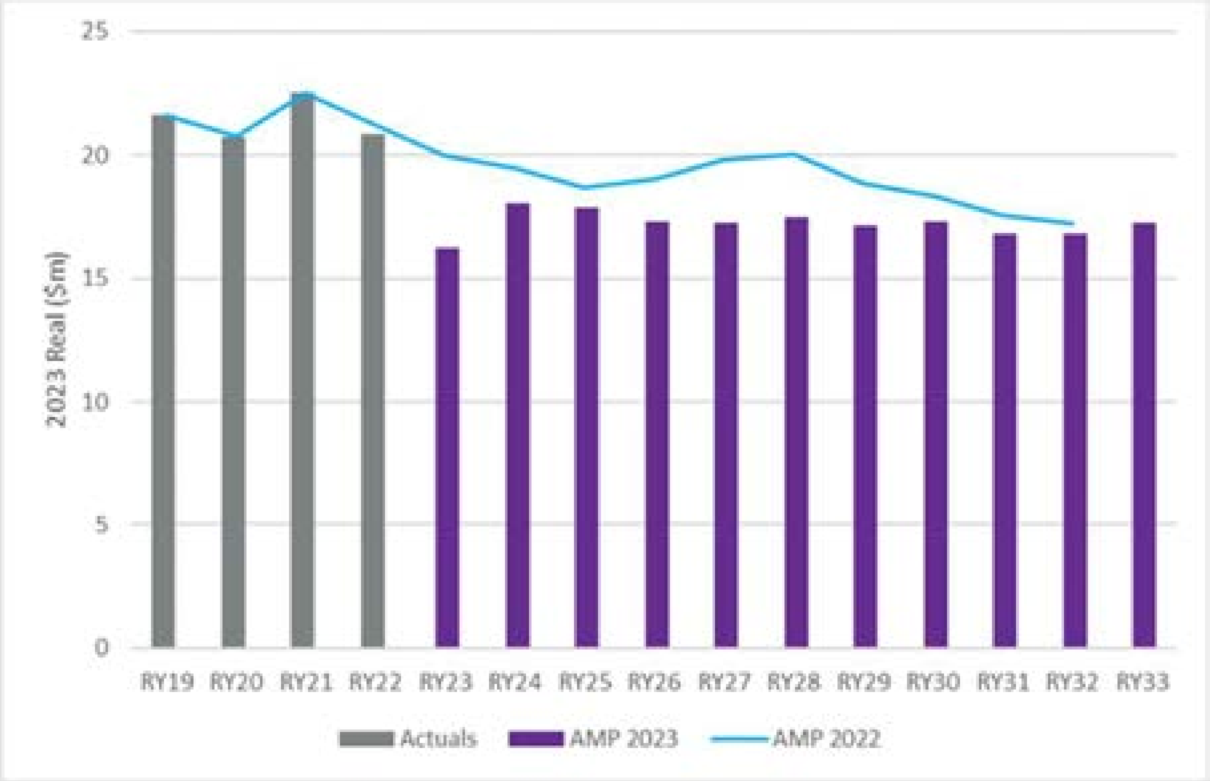
1.5.1 Capital expenditure

The forecast 10-year capital expenditure base case trend is shown in Figure 1.2. Our planned capital investments for the 2023-2033 period are set out in Chapter 7. The forecast reflects:

- A reduction in new residential connection numbers, predicting growth will slow down to pre-COVID-19 levels.
- A reduction in growth and capacity investment as electrification of process heat frees up network capacity.
- Investment to support integration of renewable gas partially offsets the drop in connection and growth, creating a shift in expenditure from subdivisions to connection of renewable gas production sources.
- Increased investment in our asset replacement and renewal ($2 million per year) has been forecast at a constant level for climate adaptation and resilience plans. This will support any resilience work required for the relocation of pipe on bridge crossings or holding spares etc, as well as managing our leak detection vehicle programme and potential short-term uplift in leaks detected on the network.
- Optimisation of our support functions though non-network capital expenditure, such as IT systems and improvements.

Information and communications technology (ICT) investment and other non-network expenditure are set to remain roughly at current levels as we continue to invest in systems and complete a major upgrade to our GIS. The forecasts for later in the planning period are slightly down against 2022, reflecting the reduction in projected residential customer numbers.

Figure 1.2: Forecast capital expenditure (AMP base case)



1.5.2 Operational expenditure

The focus for operational expenditure during the planning period is set out in detail in Chapter 7. Our updated forecast operational expenditure for the AMP planning period, as shown in Figure 1.3, signals a stable trend, in line with current levels. This reflects:

- A reduction in system operations network support because of the reallocation of customer team resource from gas to shared business support.
- An increase to business support related to digital solutions, including cloud services.
- Steady asset replacement and renewal across the period.
- Consistent routine and corrective maintenance.

Figure 1.3: Forecast operating expenditure

External forces shaping our network

Chapter 2

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2. External forces shaping our network

2.1 Reducing Aotearoa New Zealand’s carbon footprint

The Climate Change Response (Zero Carbon) Amendment Act 2019 set into law domestic emissions targets, including that all greenhouse gases (GHG), other than biogenic methane, reach net zero by 2050. In May 2022, New Zealand’s first Emissions Reduction Plan, for the period 2022-25, was published[1], signalling significant implications for the gas sector. It sets out what needs to be done for Aotearoa New Zealand to meet its first of six emissions budgets, ultimately working towards New Zealand’s net zero GHG emissions by 2050.

Through legislation and the Emissions Reduction Plan direction, a range of Government measures will materially impact gas and electricity distribution, including actions and workstreams to:

- Improve business and customer energy efficiency, including support for industry energy efficiency and conversion to low-emissions energy.
- Reduce barriers to developing and operating electricity infrastructure, including transmission and distribution networks.
- Reduce reliance on fossil fuels, including developing a Gas Transition Plan by 2024 to cover the period to 2035 and signal a longer-term pathway to 2050 for reducing emissions and evolving the role of fossil gas in New Zealand.
- Develop new or revised Government measures to support the transition to an expanded and highly renewable electricity system.
- Develop a Hydrogen Roadmap by 2024.
- Develop a National Energy Strategy by 2024 to address strategic challenges in the energy sector and signal pathways away from fossil fuels. The Gas Transition Plan, Hydrogen Roadmap and transition measures will provide key inputs into the Energy Strategy.
- Develop measures to enhance the resilience of New Zealand’s critical infrastructure resilience.
- Develop measures to implement the New Zealand Waste Strategy 2023, including a focus on diverting organic waste from landfill.
- Investigate low-emissions energy supply options for renewable gas and bioenergy to support future emissions reduction.

We have engaged with the early work related to the Gas Transition Plan and Energy Strategy. Our work in supporting these documents has reinforced our belief that delivering renewable gas to households and businesses is in the best interest of New Zealanders. Our gas network provides a critical lifeline service to many households, businesses, and essential services across the North Island of New Zealand. The Gas Transition Plan Issues Paper, released in August 2023[2], confirms the opportunity to reduce reliance on fossil gas through the use of biogas.

It’s clear that climate change mitigation has focused predominantly on minimising the extent of temperature change through reduction of GHG emissions. However, recent weather events have highlighted the need to extend that focus to include adaptation. We are seeing warmer than average temperatures on a more consistent basis and New Zealand has recently experienced a string of severe weather events that caused significant damage to homes, businesses, and infrastructure.

When recent cyclones Dovi and Gabrielle damaged infrastructure and disrupted power supplies across the country the gas network remained intact and continued to supply. Gas customers were able to cook their food,

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[1] Te hau mārohi ki anamata. Towards a productive, sustainable and inclusive economy: Aotearoa New Zealand’s first Emissions Reduction Plan (https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/)

[2] Gas Transition Plan issues paper August 2023 (mbie.govt.nz)

heat their home and have hot water. These events have highlighted the resilience of the gas networks and the importance to have optionality when it comes to powering the motu.

New Zealand is well positioned to tackle emissions in the energy and industry sectors because of our high levels of renewable electricity. However, more than 60% of New Zealand's energy supply still comes from non-renewable sources. Gas typically contributes 20-25% of primary energy supply and is an essential fuel and feedstock for the petrochemical industry and electricity generation. More than 400,000 households and businesses in New Zealand rely on gas (natural gas and LPG).

Given the extent of gas use in New Zealand[3] and the relative inefficiency of converting some gas-fuelled processes to electricity, it is not realistic to expect electricity to substitute for gas use easily or fully in the short to medium term. This should not be seen as a hiatus for the gas sector as there are options available to reduce emissions and displace fossil gas. The research and technology for renewable gas options is developing quickly. In fact, biogas technology has been in existence for more than 100 years. The manner and rate at which gas consumption is reduced or substituted by biogas, hydrogen or other alternatives will have a major impact on the make-up of energy consumption. Careful planning and coordination across all sectors will be needed to ensure that sufficient resources are available to support an orderly transition.

An energy system that provides optionality of fuel source and utilisation will deliver more resilience than a singular source system. And while gas has a key role in the transition to New Zealand's net zero energy future, a low-carbon renewable gas system will provide a more manageable transition and can also be a feature of a resilient and sustainable energy system in New Zealand.

The response to the COVID-19 pandemic around the world, while varied, has resulted in outcomes that are somewhat consistent – increased economic inflation, and a restriction of supply chains, including labour. All of this is putting cost-of-living pressure on households. At a time when a significant increase in investment is required to ensure New Zealand meets the net zero emissions targets and improves the resilience of its infrastructure to adapt to climate change, our approach to energy transition needs to be affordable. Repurposing infrastructure and leveraging off investment already made is clearly a sensible option where the outcomes align with New Zealand's emission reduction objectives.

Notwithstanding the need to decarbonise and the cost-of-living pressures, there is still a strong demand for gas in residential homes and small to medium commercial businesses. Our customers are telling us that they still value gas as an energy option. We are also finding that industrial and commercial businesses are requesting gas as a supplementary supply to their emissions reduction plans – e.g., Wellington City Council redevelopment of the Moa Point wastewater treatment facility. A biogas plant and gas dryer will be installed to deliver the objective of reducing waste and emissions, and this will need a supplementary supply of gas to ensure reliable operation.

We consider this means there is a need for continued strategic investment in our existing infrastructure. However, we need to ensure that future investment decisions include the present and emerging environmental factors, in particular:

- Declining demand for gas.
- Renewable gas to support decarbonisation and an orderly and affordable energy transition.
- Reduction of our own emissions.
- Increased need for infrastructure and energy resilience.
- Risk of asset stranding.

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[3] There was 157.5PJ of natural gas produced in 2021, which is higher than the 144.2PJ (equivalent) of electricity generated in New Zealand during the same period. (Source: Energy in New Zealand 22, MBIE)

The Emissions Reduction Plan acknowledged gas-fired generation and process heat will be needed after 2030. Similarly, the Gas Transition Plan Issues Paper confirms the need for careful management of the transition away from fossil gas to ensure gas supply continues to meet our energy needs, especially for electricity security, major industrial and process heat users. Continuing to maintain and, over time, repurpose our existing infrastructure will ensure access to supply is preserved. During the past 12 months, we have increased our focus to identify areas where we can enhance our gas infrastructure assets to enable the transportation of different gas blends, such as supporting demonstration projects using biogas and hydrogen blended with natural gas.

2.1.1 Future of gas

New Zealand is on the path to a low-emissions future. As a gas distribution business, we realise that electrification plays an important role in New Zealand reaching its emission reduction targets. Gas reticulation also has a key role in the transition to a low-carbon future. Our strategy is to build a sustainable network that supports future energy needs, enabling delivery of renewable energy to our customers. The longer-term directions set from the final 2024 Gas Transition Plan and Energy Strategy will be reflected in our plans.

We are engaging in several pilot projects and investigating opportunities to develop partnerships to support a low-emissions future. These include exploring opportunities for sourcing biomethane and potentially hydrogen for distribution in our networks as alternatives to traditional natural gas.
Our current initiatives include:

- Partnering with other New Zealand gas distribution businesses. We are supporting a project to investigate the feasibility of blending hydrogen (1%-15% with natural gas) into a distribution system in New Zealand.
- Supporting the review, development and adoption of the international and national standard frameworks that will enable transition to low-carbon fuels over time. This is in our capacity as a member and representative of Gas New Zealand's Technical Standards Committees.
- Continuing to refine our online Future Zone public website, which has education materials, case studies, FAQs and discussion points regarding the role of gas and its transition to a low-carbon world.
- Developing partnering opportunities in the biomethane space that will support local councils' waste management and minimisation plans in line with New Zealand's emissions reduction targets. It is anticipated that value-add bi-products will create investment opportunities.
- Collaborating on some hydrogen initiatives that look to reduce the carbon content of natural gas with minimal disruption to our customers' gas burning equipment.

2.1.2 Australian renewable gas tour

Australia is significantly further along the renewable gas journey than New Zealand. As Future Sure gas partners, three members of our gas team joined the Australian Renewable Gas Tour hosted by GasNZ in April 2023. Our contingent was joined by more than 20 industry specialists and the tour group visited eight renewable gas projects across five states. The objective was to understand more about the wide range of renewable gas opportunities and to determine what could be applied in Aotearoa. Some of the projects of particular interest were hydrogen gas generation and distribution, landfill gas collection, and biogas generation at wastewater treatment plants, abattoirs, and waste management centres. We will apply the technical and logistical learnings from this tour to help us on our journey of decarbonising the gas network and contributing to New Zealand's low-emissions future.

2.1.3 Process heat electrification

Process heat accounts for 28% of all energy related GHG emissions (second behind transport) and accounts for about 8% of New Zealand's gross carbon emissions[4]. With 55% of process heat supplied by burning fossil fuels, it is a prime candidate for decarbonisation. This involves switching from fossil fuels (coal or natural gas) to lower-carbon options (biomass, electric, renewable gas, or a mix of fuels). It is more economical to switch to electric for

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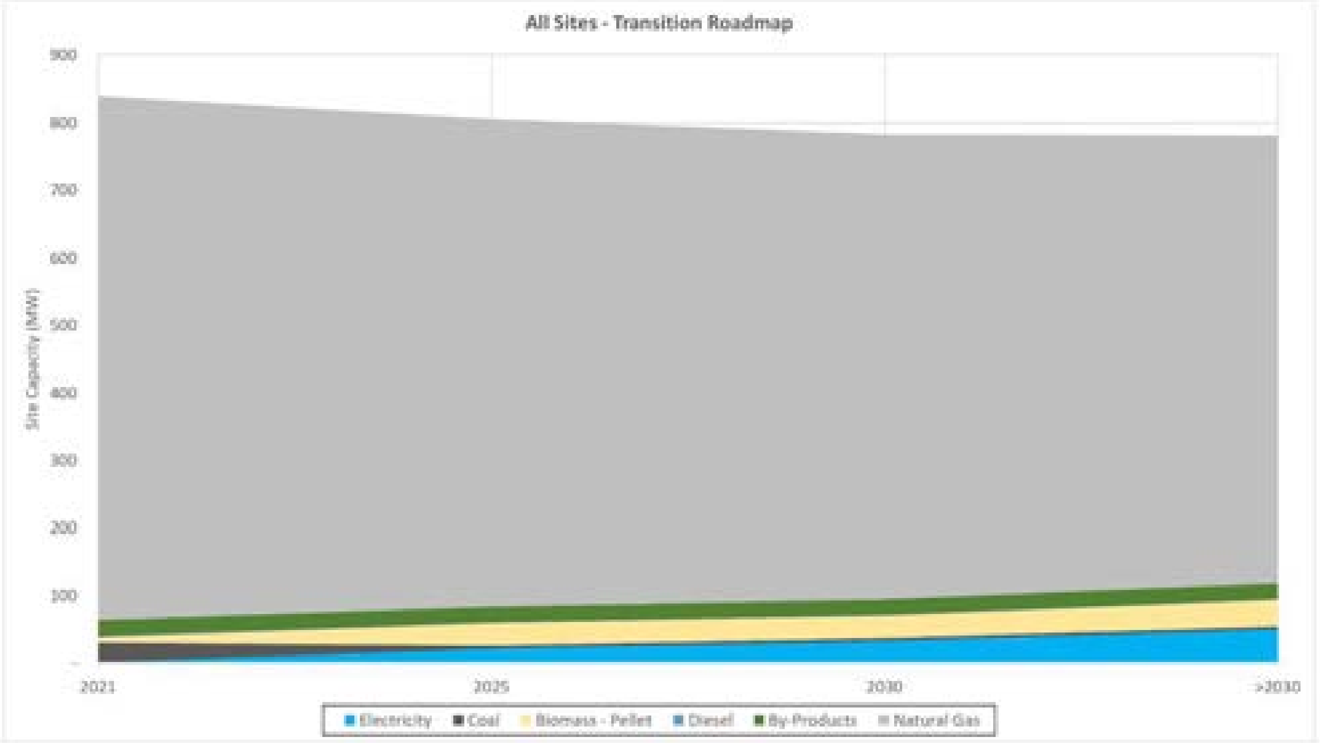
[4] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/low-emissions-economy/decarbonising-process-heat/#:~:text=In%20a%20New%20Zealand%20context,approximately%208%25%20of%20gross%20emissions

low temperature process heat less than 100°C (e.g., industrial water heating or food processing). Medium temperature processes at 100-300°C (e.g., milk drying or heating schools) may be suited to electric or other options. High temperature processes greater than 300°C (oil refining and metals) are more suited to other options, such as biomass or renewable gas. In addition, the sheer extent of the energy required for the more intensive operations may be beyond the capacity of distribution networks to supply or require significant upgrade works[5].

During 2022, we initiated a project with DETA Consulting (DETA), co-sponsored by Energy Efficiency and Conservation Authority and Transpower, to determine the possible extent of process heat conversion on our electricity network footprint. We have about 90 large industrial and commercial customers using process heat on our footprint (with >500kW installed boiler capacity). Most of those customers indicated they were still in the process of developing their decarbonisation plans.

Based on our assessment of the DETA report, natural gas and blended renewable gases are predicted to remain as a transition fuel beyond 2030, as illustrated in Figure 2.1. The total energy demand will reduce by approximately 4% by 2030. It is also anticipated that the capacity of electricity and biomass will increase resulting in a reduction of capacity requirement for gas by 20%.

Figure 2.1: Reference from DETA's "Powerco Thermal Fuel Transition Impact Assessment Final Report 30 June 2022"



2.1.4 Our pathway towards a low-carbon future for our customers

Informed by industrial decarbonisation forecasts (outlined above) and market research in the residential and commercial customer segments, our base case scenario for growth, as shown in Figure 2.6, reflects a flat demand trend for future gas connections, in line with the historical connection volumes experienced before the building boom 2018-2019. This lower growth forecast is set against a forecast reduction of overall distributed gas volume.

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[5] When point demands start to exceed about 30MVA, it becomes increasingly impractical or uneconomic to connect to distribution networks, even at 33kV. Direct grid connections, or higher voltage subtransmission networks, are generally necessary, which in some cases may still be provided by distribution utilities.

We believe this is appropriate as some customers transition away from gas and networks transition towards lower-carbon fuels, such as biogas and hydrogen.

Our connection and demand forecasts have also considered the customer cost to transition away from gas. Feedback from our customer insights programme suggests that most customers would stay with gas and connect to gas as an energy option in the future, even if there is a cost increase relative to electricity, particularly given the capital cost to replace appliances. This is further reinforced if there is a low-carbon renewable gas option and more certainty to the longevity of gas supply.

There are challenges with the transition of residential customers from natural gas. These are significant when looking at whole-of-system transition. Case Study 1 below provides an explanation of the challenges and costs to convert customers to alternative sources of energy[6].

2.1.5 Case Study 1: Esperance Western Australia Reticulated Gas Transition – decommissioning a network

Background

The owner of a local reticulated gas distribution network supplying the small town of Esperance in Western Australia announced in 2021 that operation of the network was no longer economic, and supply would cease from the end of March 2023. Horizon Power, on behalf of the state government, has been helping all impacted customers to safety transition away from the reticulated gas network to a new energy source. This has resulted in 379 impacted homes and businesses requiring support and state government funding to enable the transition. While applications for 97% of the impacted residents have been received for support to an alternative energy source, such as electricity, options remain open for customers to receive their preferred energy source through bottled gas.

Lessons learned from this project are:

- Deferral of the project by 18 months to allow for the decommissioning process. At 18 months (March 2023), some customers were still to be converted to an alternative energy source.
- A $10.5m government support package (average $27,000 per connection) to enable the transition process. This covered full cost for like-for-like replacement of appliances, installation, and electrical work.
- Businesses receive energy audit and grants to support the transition.
- Support managed through network operator.
- Financial support paid to trades people directly for approved works. Customer (property owner) arranges quotes, applies for approval, and manages the work.
- New local renewable energy hub commissioned mid-2022 provides 46% of Esperance's electricity demand through 4MW solar, 4.5MW wind, 4MW battery storage and has generator back-up.

Key take aways from this project:

- Potentially pragmatic approach when managing ongoing condition-based risk associated with small networks.
- It takes time to facilitate change.
- Customer impacts should not be underestimated.
- Difficult to envisage this approach on a much larger scale. The complexity of gaining a consensus of customer agreement and the technical complexity of operating a large network through a targeted transition will need significant planning to avoid safety and reliability events.

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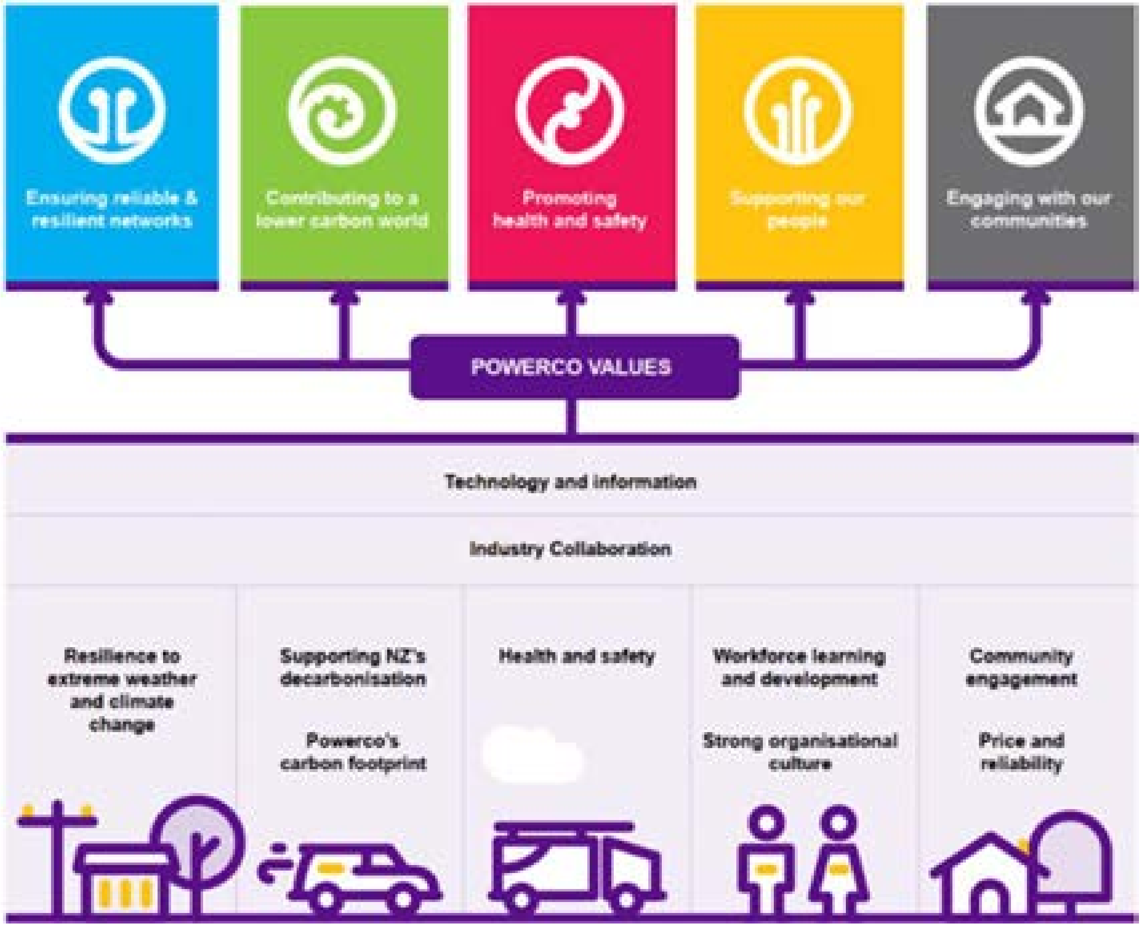
[6] Esperance WA case study 230109_Report_Risks-to-gas-consumers-of-declining-gas-demand_final.pdf (energyconsumersaustralia.com.au)

2.2 Enabling a sustainable energy future

We are committed to contributing to a lower carbon future. Therefore, sustainability is embedded in the way we work. Balancing the needs of our communities, our environment, and the financial health of our business, is reflected in our commitment to enabling a sustainable energy future. This is displayed in our annual Sustainability Reporting[7], which sets out our plans and goals for a sustainable business from an environmental, social and governance perspective. Our pillars for a sustainable business, as shown in Figure 2.2, were developed through a process of stakeholder engagement and form the framework of our Sustainability Strategy.

Figure 2.2: Powerco's pillars for a sustainable business



Our Sustainability Strategy covers the full range of environmental, social and governance topics and targets the most material issues that we can impact. Of particular interest is our critical role in New Zealand's transition to net zero emissions by 2050, and we recognise the path to achieving our global reduction targets presents both challenges and opportunities. Our Sustainability Strategy is based on taking meaningful action to minimise our impacts, both on and from climate change, by reducing our GHG emissions, enabling our customers to decarbonise, and mitigating our physical and transitional climate change risks. With an abundance of information circulating about decarbonisation and sustainability, we're also increasing our focus on stakeholder education, to bring everyone along on the journey with us. Our sustainability roadmap to carbon reduction, along with associated goals and targets, is presented in Figure 2.3.

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[7] FY22 Sustainability Reference Report – December 2022 https://www.powerco.co.nz/-/media/project/powerco/powerco-documents/what-we-do/sustainability-doc-2022.pdf

Figure 2.3: Our sustainability roadmap to carbon reduction

Goals and targets FY24

Short term (1 April 2023-31 March 2024)

- Deliver energy security to gas customers by keeping gas flowing 99.99% of the time.
- Achieve <100 pipe leaks per 1,000Km per annum.
- Undertake our first round of gas leak detection, using new equipment that will provide more accurate data to determine specific emissions mitigation options.
- Update Powerco's low-carbon transition strategy.
- Determine the optimal blend and volumes of low-carbon gas for the gas network.
- Maintain a net promoter score of 52 to measure our quarterly gas customer service and customer experience.
- Reduce our target scope 1 and 2 emissions sources in line with reduction targets.

Medium term (1-3 years)

- Evaluate gas leakage data quarterly using MarcoGaz leakage model.
- Expand the scope of target emissions sources to include fugitive gases, with a view to align loses with current reduction targets.
- Determine appropriate reduction targets for our supply chain and implement.

Long term (3+ years)

- 20% reduction on natural gas volumes going through the network by 2030 (compared with FY20) and identify specific year-on-year volume reduction for FY25-FY30.

We review our material sustainability issues every three years and are undertaking a review of our initial materiality insights during 2023.

Our GHG emissions are relatively small compared with the impact we can have through the successful transition of higher emitting industrial customers away from fossil gas onto renewable lower-carbon fuels, such as biogas for our residential and commercial customers.

Our Climate Change Policy commits to "applying a sustainability mindset to our investment decisions and operational practices to minimise their impacts on and from the climate". Our action on climate change, support of electrification of process heat, and GHG emissions reductions are part of our contribution to this. We annually publish a GHG inventory report as part of our contribution to this commitment[8].

Some of the direct activities we are working on to reduce emissions are:

- Participating in the joint industry demonstration of alternative gas mix options using hydrogen. This initiative investigates how we could use our existing gas pipelines and infrastructure to distribute hydrogen mixed with natural gas creating a lower-carbon gas mix to homes and businesses. Working collaboratively with other gas distribution businesses, this work will establish safety, quality, commercial and consumer requirements for transitioning gas networks to distribution of a blend of hydrogen and natural gas.
- Undertaking a feasibility study to understand if the gas business could set a more robust asset-based emissions reduction target using the MarcoGaz model for calculating natural gas pipelines loses (scope 1

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[8] Refer "Greenhouse gas emissions inventory report - financial year ending 31 March 2022 (FY22): https://www.powerco.co.nz/-/media/project/powerco/powerco-documents/what-we-do/final-ghg-report-with-assurance-report.pdf)

and 2 emissions), including damage to pipelines caused by third-party incidences and leak survey data. We will use this information to adjust processes to reduce natural gas loses as much as possible.
- Undertaking a programme of more intensive leak detection surveys with the purchase of a new gas leak detection vehicle. This will improve the frequency of detecting and monitoring leaks on the gas network while providing us with opportunities to reduce our overall scope 1 and 2 emissions.
- Developing partnerships to facilitate the generation and uptake of large and small-scale biogas alternatives.
- Ensuring we source our assets from responsible suppliers, using sustainably sourced materials.
- Working with industry partners in Australia and New Zealand to change industry standards, allowing for a renewable gas alternative to be provided safely for our customers.
- Partnering with industry experts to test appliances with a natural gas and hydrogen blend.
- Working with local councils and renewable gas experts to partner on large scale hydrogen and biogas gas heat solutions.
- Facilitating or incentivising customers' decarbonisation efforts through energy solutions, efficient gas use and energy pricing.
- Assisting the Government to understand the costs, benefits, and opportunities for our residential customers as we transition to an increased focus on electricity and alternatives to natural gas – hydrogen, biogas and blended gas options.

We have completed an assessment of pipeline materials that confirmed there are no compatibility issues in transitioning towards the use of bio-gas across our existing network. Standards are now being assessed to incorporate renewable gas. System capacity is still to be assessed as renewable gas options are identified.

2.3 A resilient network for the future

Resilience and reliability have always been a focus in relation to our network and gas supply. We're facing increasing climatic extremes as a result of a warming climate. While our gas architecture and the design of our networks presents a strong basis for reliability and resilience, the impacts of climate change will test the inbuilt resilience as well as our operational and response capability. Considering the impact of a changing climate on our operating environment, we will need to ensure future investment enables us to maintain safety and reliability. Where we identify the need, we will adapt our network and operations to cater for increasing risks of severe weather and related impacts to our operating environment.

To be confident that our assets and activities are robust and flexible in the face of climate change, we continually assess the implications of climate change on our infrastructure and business operations. To build on this analysis, and in alignment with the framework proposed by the Task Force on Climate Related Financial Disclosures (TCFD), we have recently developed four challenging and unique scenarios that are specific to us. Figure 2.4 shows the high-level descriptions of each scenario, giving context to each of the different plausible worlds.

Figure 2.4: High-level descriptions of each climate change scenario

These scenarios include several representative concentration pathways forecasts adopted from the Intergovernmental Panel on Climate Change and consider a range of possible GHG concentration trajectories. They are centred on how New Zealand and the global transition to a zero carbon future (or lack of) will plausibly affect us over the short (2035), medium (2050) and long term (2080).

These climate scenarios help us to explore and develop an understanding of how the physical and transitional risks and opportunities of climate change might plausibly impact our network assets and business operations over time.

Figure 2.5: Physical and transitional risks and opportunities of climate change

Transitional risks and opportunities result from:

- **Social**
- **Technology**
- **Economic, and**
- **Policy changes occurring in the transition to a low-carbon economy**

Physical climate risks result from:

Extreme weather events or from longer term shifts in climate patterns caused by climate change

Using these scenarios, we will undertake a climate-related risk assessment to identify our priority physical risks, transitional risks, and opportunities over the short, medium, and long-term timeframes.

The goal is to ensure our asset management approach, processes, strategies, planning, and investment decisions address the physical and transition risks and opportunities. By incorporating climate risk management into our asset management strategies and business-as-usual processes, we aim to deliver a safe, reliable, resilient, and cost-effective gas supply for customers now and into the future.

To further inform our asset management strategies, we will be advancing the work from our physical risk assessment in alignment with our Adaptation and Resilience Plan. This will include an asset exposure analysis of flooding and coastal inundation (sea level rise) using recently developed GIS spatial layers, which align with our climate scenarios. We will also include our learnings from recent storm events, such as Cyclone Gabrielle, and merge this with the strategies required to mitigate transitional risks.

2.3.1 Case Study 2: The value of a resilient energy option – Cyclone Gabrielle in Hawke's Bay

In February 2023, Cyclone Gabrielle caused unprecedented devastation across the North Island. More than 107,000 of our electricity customers were affected by power loss (33% of our network). There was significant damage to our electricity network across Coromandel, South Waikato, eastern Bay of Plenty, Taranaki, Manawatū, and the Wairarapa. The damage and impact to Unison Network's electricity network in Hawke's Bay was even more significant, with some customers losing electricity supply for four weeks.

Our gas network in Hawke's Bay proved resilient and an essential lifeline for customers without electricity. While our gas pipeline crossing the Ngaruroro River bridge in Napier sustained damage when it was pulled away from the supporting structures because of flooding and slash, its integrity was maintained, and gas supply was not interrupted. All other bridge crossings and underground pipes remained undamaged and there was no loss of gas supply throughout our Hawke's Bay network. Gas supply for cooking and hot water provided an essential lifeline for many Hawke's Bay residents when electricity was not available.

While the architecture and design of our networks presents a strong basis for reliability and resilience, Cyclone Gabrielle also tested our operational and response capability. Field crews worked in difficult conditions over several days to check and confirm the integrity and accessibility of our gas critical network assets, ensuring they remained safe and operational. Our emergency contingency plans supported this process.

Lessons learned:

- We will relocate the pipeline at the Ngaruroro site to the opposite side of the bridge where it will be less susceptible to flood damage. This will help make this part of the network even more resilient to future events.
- Our resilience and reliability planning in relation to our network and gas supply needs to continue as a core focus.
- Gas supply to community hubs and points of refuge proved invaluable for those who required shelter, warmth and food.
- Learnings from this event will inform our asset management planning and our climate adaptation planning.

Key take aways:

- Natural gas networks are resilient in the face of natural hazards and can continue to provide a critical energy option when electricity reinstatement may take some time.
- The event highlighted that the value of resilience is much more than the economic cost of not having an energy supply.
- There are societal costs and community impacts when there are long extended periods without energy amidst the other devastating consequences faced by residents during and after such an event.

2.4 Looking ahead

We forecast a period of transition where new connection numbers, network growth, and the overall demand for gas reduces. Demand for gas from industrial and large commercial customers is reducing and will continue to reduce as this sector executes its plans to reduce emissions.

A recent reduction in customer connections and new development is reflective of a slower economy, post the 2020-2022 COVID-19 response, and is consistent with a corresponding reduction in building consents. While we expect applications for connections to pick up as the economic situation improves, because of the increasing cost of gas we do not anticipate a return to the growth experienced from 2018-2020.

In 2021, the Climate Change Commission recommended that the Government introduce a ban on new gas connections in New Zealand. This recommendation was not taken up as an element of New Zealand's first emissions reduction budget. The draft 2023 recommendations[9] for New Zealand's second Emissions Reduction Plan outlined a similar recommendation, although there are a couple of notable changes:

- A recommended ban on new fossil gas connections has a number of exclusions and notes a need for pragmatism.
- Where there is no better affordable renewable energy option, gas should still be considered.

While this represents a change in messaging by the Climate Change Commission, the overarching direction to move away from fossil fuels (gas) is consistent. This direction is also signalled in the Gas Transition Plan Issues Paper (August 2023). A long-term sustainable outlook for gas requires a transition to renewable gas.

Figure 2.6 shows the forecast customer connection Capex through to RY33.

Figure 2.6: Customer connection Capex reflecting the base case scenario for growth

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[9] 2023 Draft advice to inform the strategic direction of the Government's second Emissions Reduction Plan » Climate Change Commission (climatecommission.govt.nz)

Given the expected future consumption trend of gas through the transition period to 2050, a managed transition to blend biogas and, potentially, hydrogen will offer a more acceptable lower-carbon and sustainable solution. Figure 2.7 shows that while the total number of industrial customers is low, the emissions produced by industrial processes is high using ~40% of gas on our network. Therefore, reducing gas use by industrial customers on our gas network offers the best opportunity for emissions reduction.

The impact of banning new residential connections and transitioning residential and small commercial customers to electricity is significant and presents little benefit in reduction of emissions. Studies in New Zealand, including our study commissioned in 2022, show that there is sufficient biogas potential to meet current demand of the residential and small commercial gas customers in New Zealand.

In view of this, our pathway towards a low-carbon future is focused on a transition to biogas and hydrogen alternatives over the longer term to support household and small business. This pathway is illustrated by our low-carbon transition strategy, which anticipates a transition from research, preparation, blending, to 100% green gas. Chapter 4 of this AMP outlines our Future Focused Strategies.

Figure 2.7: Our gas customer category numbers and use of gas on our network

AMP overview

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3. AMP overview

Powerco is a privately owned utility with two institutional shareholders[10]. We operate the largest network of electricity and gas distribution services in New Zealand by geographical area and network size, serving about 340,000 connections, or about one million customers.

This chapter provides the context for our 2023 Asset Management Plan (AMP) for the gas business. It outlines the purpose and objectives of the AMP, who it is written for, and how it is structured. It also introduces our network and provides an overview of the regions, network footprint and assets on our network.

3.1 Who we are

For more than a century we have distributed gas to New Zealand homes and businesses serving more than 113,000 customers across the North Island. We're one part of the power supply chain. Natural gas is extracted from onshore and offshore wells such as the Māui gas field in Taranaki, then sent along national transmission networks operated by First Gas to the gas gate of a distributor. We own and maintain the local pipelines that deliver energy to the people and businesses who use it. Our customers pay their retailer for the energy they use, and some of what they pay comes to us so we can continue to invest in our network to ensure energy supply is safe and resilient. Figure 3.1 shows the gas supply chain.

Figure 3.1: Gas supply chain

3.2 Purpose of our Asset Management Plan

The purpose of this AMP is to describe the gas asset management and planning processes we implement to achieve our Asset Management Objectives of:

- **Safety and Environment:** Protecting the public, our employees, our service providers and the environment from the inherent risks posed by a gas network sits behind everything we do.
- **Customers and Community**: We provide an essential service to our communities. We do this based on our customers' requirements and preferences.
- **Networks for Today and Tomorrow:** We will continue to develop secure and enduring energy supplies that will meet our customers' needs reliably and efficiently, now and in the future.
- **Asset Stewardship:** We operate a large number of diverse assets, which we will manage efficiently and keep in good health.

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[10] Queensland Investment Corporation (58%) and AMP Capital (42%)

- **Operational Excellence:** Good asset management helps us deliver a cost-effective, safe, and reliable service to our customers. We continuously improve and develop our people, systems, and processes.

Our vision is that by 2027, we will be a customer-focused infrastructure owner of choice. Our purpose is to connect communities by working better together, working smarter, being future focused, and taking an integrated business-wide approach to our work. Effective asset management is a cornerstone for the delivery of our vision and strategy. It enables our strategy delivery at all levels of our organisation.

Our asset management practices and documentation including our Asset Management Policy, Asset Management Objectives, and asset class strategies and plans are underpinned by *Ngā Pou – the pillars of our work, Ngā Tikanga – Our Way* (our cultural framework), our corporate vision, and corporate purpose.

The outputs of our annual business planning processes include:
- The operational programme, which drives operational expenditure (Opex) on our gas network and informs the development of our asset maintenance plans.
- The capital programme, which drives capital expenditure on our gas network.
- Gas Work Plan.
- AMP or Updated AMP.

3.2.1 Our annual business planning process helps inform our AMP

The AMP incorporates plans and initiatives from Powerco's annual business planning process. The key corporate plans, policies and standards used to guide our AMP are:
- Powerco Integrated Business Plan FY24-FY27
- Powerco Asset Management Policy
- Powerco Risk Appetite Statement
- Powerco FY21 Sustainability Reference Report
- Powerco Climate Change Policy
- Powerco Environmental Policy

3.3 AMP planning period

Our AMP covers a 10-year period, from 1 October 2023 to 30 September 2033. Consistent with Information Disclosure requirements, greater detail is provided for the first five years of this period.
Our Board of Directors certified and approved this AMP on 26 September 2023.

3.4 Network description

With approximately 6,100km of pipeline, we are one of New Zealand's largest gas distribution utilities. Our underground gas network supplies approximately 113,000 urban and rural homes, businesses, and industries in the Wellington, Hutt Valley, Porirua, Taranaki, Manawatū, and Hawke's Bay regions, as shown in Figure 3.2. The majority of those connections are to homes for families to take advantage of the continuous hot water, cooking and heating that natural gas provides.

Figure 3.2: Powerco gas distribution network boundary

Our gas network assets consist of:

- Main and service pipes
- Regulator stations
- Line and service valves
- Special crossings
- Monitoring and control systems
- Cathodic protection systems

The operation of our network also involves non-network assets such as Information Technology (IT) systems, offices, specialist tools and vehicles.

3.5 Our stakeholders

Our network of underground gas infrastructure serves residential, commercial, and industrial customers representing about 39% of all the gas connections in Aotearoa. To support the transition to a lower carbon energy future, it is our job to be ready to enable delivery of renewable energy to our customers when they are ready to transition, and to support our stakeholders' interests in their decisions – making sure we offer a reliable and sustainable service that's affordable for all Kiwis. To do this, stakeholders' interests are identified through various mechanisms, for example consumer questionnaires and market research. We regularly consult with our stakeholders to identify their expectations. Clear responsibilities are established inside Powerco to make sure that stakeholder interests are appropriately supported.

3.5.1 Stakeholder list and main interests

Our key stakeholders, their interests, and how we identified them, are summarised in Table 3.1.

Table 3.1: Stakeholder, main interests, and how interests are identified

Stakeholder	Main interests	How stakeholder interests are identified
Gas customers	Service quality and reliability Price Safety Information Environmental Seamless experience with their gas installation	Market research studies Engagement and consultation with retailers Dedicated client managers for major consumers Gas Hub website analysis Satisfaction surveys after connections through the Gas Hub Gas Hub presence at home shows
Retailers	Service quality and reliability Price Safety Efficient business-to-business processes	Regular meetings Network Service Agreements Retailer consultations Active participation with Gas Industry Company
Public, landowners, iwi	Public safety Land access and respect for traditional lands Environmental	Consultation and feedback Access and easement negotiations and agreements Acts, regulation, and other requirements
Transmission	Technical performance and rules compliance	Involvement in the Gas Association of New Zealand
Other distribution companies	Standards setting Benchmarks	Involvement in industry bodies
Our investors	Efficient and effective business management and planning Financial performance Governance Risk management	Corporate governance arrangements Formal reporting KPIs
Commerce Commission	Pricing levels Quality standards Effective governance Appropriate expenditure Effective asset management Information Disclosure	Meeting with commissioners and staff Quality response to consultations papers, decision paper and regulatory determination
State bodies and regulators	Safety (WorkSafe) Market operations and access via the Gas Industry Company Environmental performance (Ministry for the Environment)	Published acts, rules and determinations Formal reporting On-going consultation
Employees	Safe, productive working environment Training and development Security of employment Remuneration Continuous improvement, adoption of new technologies	Regular dialogue, internal communications and employee surveys Employment negotiations
Contractors	Safe, productive working environment Commitment in works volume	Contractor negotiations and dialogue Contract managers present in the regions

Stakeholder	Main interests	How stakeholder interests are identified
Other Powerco divisions	Expertise sharing Standardisation of tools and systems	Regular discussions across the business Tactical initiatives discussed and coordinated

Accommodating stakeholders' interests into our asset management practice

Most of our stakeholders have long-term interests that align with the long life of our assets. We reflect these requirements in our governing policies, objectives, and processes.

We also work alongside our stakeholders to look past our 10-year planning period, ensuring our assets are designed to serve them now and into the future. In recent years, the role of gas in a low carbon future has been questioned. As a response, we are engaging across the sector to explore what alternative fuels could be distributed through our network. New technology to produce hydrogen, biogas or synthetic natural gas will become viable alternatives to traditional natural gas extraction. We are assessing our business and network strategies in response to these possible scenarios and creating opportunities for partnerships which may include a network transition plan, and investigating options to invest in the transport of cleaner low carbon gas.

Our customers

We target and achieve a very high level of availability to ensure that all customers receive the same level of service, in terms of reliability, sustainability and affordability, and a high level of customer service supporting our customers through the energy transition.

Customer overview

We exist to serve the energy needs of our customers. Our customers rely on us for a safe and sustainable supply of gas at an affordable price. We serve three customer type classifications consisting of eight network load groups. The load group names and the criteria for allocating customers to these groups are described in Table 3.2.

Table 3.2: Typical characteristics of different load group customers

Load group	Typical customers
Residential (≤10 scm/hr)	
G06	Low volume residential customers.
G11	Standard residential customers. Small commercial customers: small cafes, fish and chip shops, pizza shops.
Commercial (10-200 scm/hr)	
G12	Restaurants, small apartment / office buildings, small to mid-sized motels.
G14	Hotels, large motels, shopping complexes, swimming pools.
G16	Large office buildings, apartment blocks, commercial kitchens.
G18	Commercial laundries, dry cleaners.
G30	Large commercial customers, large hotels. Commercial customers which are at risk of bypass.
Industrial (>200 scm/hr)	
G40	Manufacturing and industrial businesses.

Six of the load groups are defined by nominal capacity, in standard cubic meters per hour (scm/hr) and by annual consumption; and they are charged at the standard published tariffs. The remaining two (G30 and G40) are considered non-standard customers that fall outside the definitions above and/or because individual pricing arrangements apply to them.

Residential/small commercial customers: Customers in the residential and small commercial category use about 30GJ per year with a maximum load of less than or equal to 10 scm/hr. These customers generally use individual hot water systems, whether instantaneous or storage cylinders, central heating systems or gas cooking equipment. This drives high demand peaks in the morning and evenings when people use these appliances at home. In comparison, consumption during the rest of the day is low. Our current network performance objectives have been set to accommodate these customers anywhere on our network.

Commercial customers: The commercial customer group is diverse, and includes restaurants, office buildings and small industries where the gas is used to cook, heat spaces or water at a large scale. These customers have a high load (between 10 and 200 scm/hr), but they mostly use their appliances during daytime.
Our current network performance objectives have been set to accommodate these customers with a maximum load of up to 60 scm/hr without having to undertake reinforcement work. If a customer's load is larger, we work with them to find the best way to connect to the network at a competitive price. This includes a balanced customer contribution.

Industrial customers: These customers usually use gas as part of their industrial processes. They are typically dairy, food processing, healthcare and education facilities, or sawmill plants. The loads tend to be large (more than 200 scm/hr) but relatively stable throughout the day. The network is generally not designed to cater for these customers without reactive, targeted reinforcement work. We have key account managers who look after these customers to anticipate their future needs, which are then integrated into our long-term plans. We also operate at higher pressure in industrial parks to provide greater capacity, such as Bell Block in New Plymouth or Mihaere Drive in Palmerston North.

Large customers that have a significant impact on network operations or asset management priorities

All parts of the network are operated to the same level of availability. However, load group G40 industrial customers have a significant potential to impact network operations because their consumption is high. The impact that each large customer has is influenced by the area it is in and the customer's load profile and operational requirements. For example, the available timeframe for maintenance is dictated by the specific needs of each customer or network development based on demand forecasts. As such, each new G40 customer is assessed on a case-by-case basis to ensure that the network can supply the required gas volumes and the same level of availability of the network is maintained.
Table 3.3 illustrates the correlation between the number of customers in each category and their annual volume.

Table 3.3: Comparison of network customers numbers with gas consumption (as of 30/09/2022)

Customer type	Gas consumption %	Number of ICPS
Residential/small commercial	35	110,462
Commercial	24	2,892
Industrial	41	98
TOTAL	100	113,452

Because of their impact on the reliable operation of our networks, specific attention is given to G40 industrial customers.
Figure 3.3 and Figure 3.4 illustrate the region and sector of these customers.

Figure 3.3: Breakdown of large customers by region

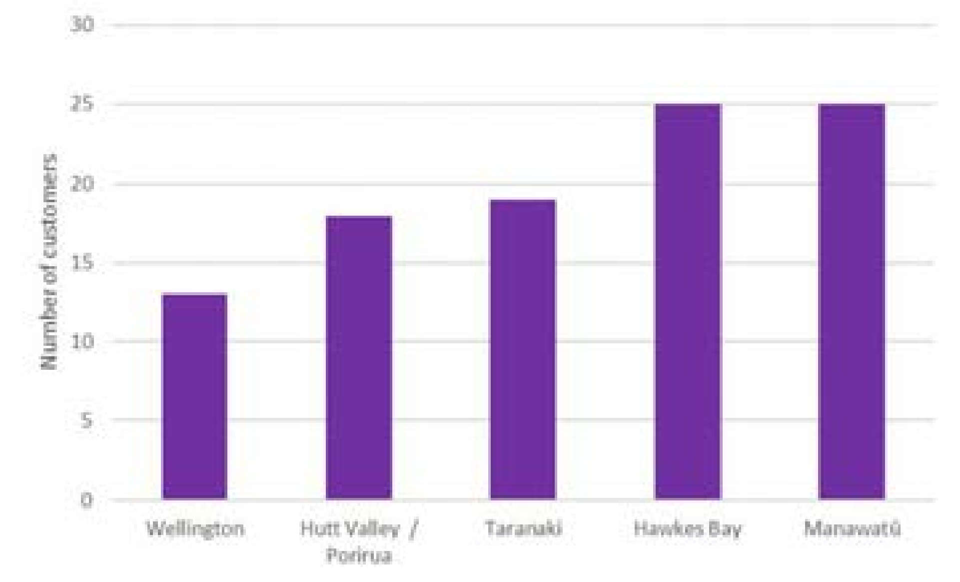
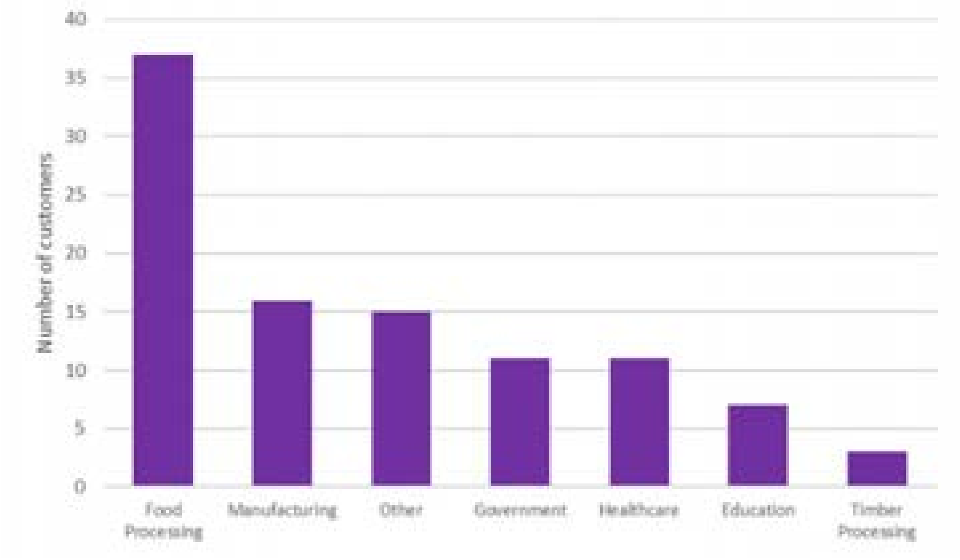
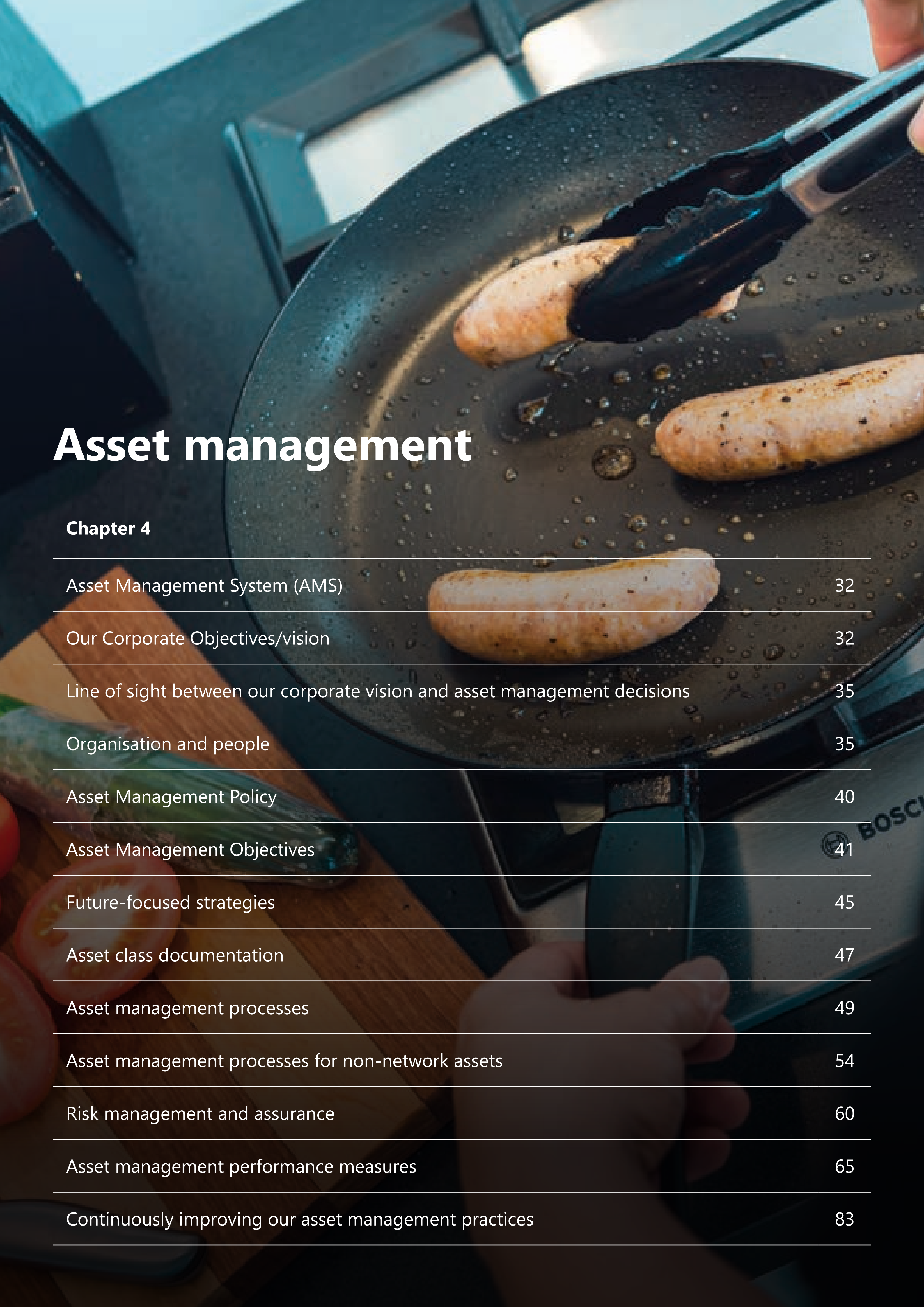


Figure 3.4: Breakdown of large customers by sector





Asset management

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4. Asset management

We are a leading energy infrastructure asset manager. Managing infrastructure and assets is one of our core skill sets, and we are very proud of our asset management capabilities. Powerco's asset management framework spans both the Electricity and Gas divisions. This section relates specifically to the Gas division.

4.1 Asset Management System (AMS)

Our AMS encompasses our physical gas assets, as well as our systems, processes, information, and our people. It also consists of various planning documents that describe the implementation and alignment of our Corporate Objectives to the delivery and management of our assets.

Our AMS provides alignment with, and line of sight from, business planning and objectives through to the day-to-day management of our assets. This enables our gas business objective – to deliver a safe, reliable, resilient, and cost-effective gas supply to our customers – to be achieved. Our AMS enables effective decision-making. We are aligning our gas AMS with the principles of internationally recognised asset management standard ISO: 55001. Our Electricity division's AMS was certified to ISO: 55001 in 2022.

Our AMS and gas asset management approach accounts for Acts (and amendments), Government regulations and plans, and industry codes and guidelines, including:

- AS/NZS 4645.1 Gas Network Management
- AS/NZS 2885 Pipelines – Gas and liquid petroleum
- Cadastral Survey Act 2002
- Commerce Act 1986 (Part 4)
- Civil Defence and Emergency Management Act 2002
- Emissions Reduction Plan – 2022
- Gas Act 1992 and Gas Amendment Act 2006
- Gas Industry Company Determinations, Guidelines and Notices
- Gas Governance (Compliance) Regulations 2008
- Gas Governance (Critical Contingency Management) Regulations 2008
- Gas (Levy of Industry Participants) Regulations 2022
- Gas (Safety and Measurement) Regulations 2010
- Government Roading Powers Act 1989
- Hazardous Substances and New Organisms Act 1996
- Health and Safety at Work Act 2015
- Heritage New Zealand Pouhere Taonga Act 2014
- Local Government Act 2002
- National Adaptation Plan – 2022
- New Zealand Standard (NZS) 7901:2008 – Electricity and Gas Industries – Safety Management Systems for Public Safety
- NZS 5263:2003 Gas Detection and Odorization
- Privacy Act 2020
- Railways Act 2005
- Resource Management Act 1991
- Utilities Access Act 2010.

4.2 Our Corporate Objectives/vision

We operate on commercially sound and sustainable principles, which means we also take our responsibility towards our customers and the planet very seriously. We are committed to balancing the needs of our people, communities, environment, and business as we deliver energy to about 1.1 million customers. Our pillars for a sustainable business guide us on our sustainability journey, as shown in Figure 4.1.

Figure 4.1: Our pillars for a sustainable business

Sustainability pillars

Whirinaki
Ensuring reliable & resilient networks
Ensuring our networks are reliable and resilient now and into the future.

Taiao
Contributing to a lower carbon world
Helping Aotearoa achieve our emissions targets by faciliating the use of low carbon technologies and energy sources.

Hauora
Health and safety at our core
Keeping people safe around our networks and worksites is our priority.

Manaaki Tāngata
Supporting our people
Fostering a culture that empowers people to do their best, values diversity, and meets our future needs.

Whakakotahitanga
Engaging with our communities
Working with you to understand your needs and guide the decisions we make to deliver the best outcomes.

Figure 4.2 shows our Ngā Tikanga, vision and purpose statements. These are underpinned by our pillars for a sustainable business.

Figure 4.2: Our Ngā Tikanga, vision and purpose statements

Ngā Tikanga
- Future focused
- Proud to be here
- Better together
- Working smarter

Powerco's vision statement
By 2027 we are a customer focused infrastructure owner of choice.

Powerco's purpose statement
We connect communities

Ngā Tikanga – Our Way

In line with our long-term approach to asset management, investment in our gas network reflects our guiding philosophy of moving forward together as one. Ngā Tikanga – Our Way is our cultural framework. As shown in Figure 4.3, Ngā Tikanga – Our Way guides us as we work together to achieve our purpose of connecting communities. It incorporates our purpose, values, and our ways of working. It best describes who we are and how we work with each other, our partners and industry stakeholders to get the best outcomes for our communities. Ngā Tikanga – Our Way is inspired by tikanga, a Māori concept that refers to the ethical framework of Māori society.

Figure 4.3: Ngā Tikanga – Our Way


Ngā Tikanga
Our Way

We connect communities

Proud to be here
We're recognised for the difference we make and are respected for our actions and decisions. Our customers and communities value and trust us.

Better together
We're one team and stronger for it, inspired by our purpose to keep our communities connected and supporting each other to achieve great outcomes.

Working smarter
Innovating, learning and improving together every day, we keep things simple and streamline our approach.

Future focused
We're passionate about making sustainable choices that will help our communities thrive now and into the future.

Gas division

The work and investment programme presented in this AMP and our overarching gas strategy, as shown in Figure 4.4, are aligned to our corporate pillars, objectives, vision and purpose.

Figure 4.4: Our overarching gas strategy

Proudly playing our part in creating a sustainable energy future for Aotearoa by being a trusted partner of choice.

Committed

We are committed to providing a sustainable, affordable, quality/fit-for-purpose gas in the next 2-4 years, and are working hard to ensure regulation does not foreclose a biogas option.

Sustainable

We are increasingly sustainable as we reduce our emissions from leakage and are clear on how we will gradually transition customers to either sustainable, affordable, quality/fit-for-purpose gas or to electricity or renewable energy.

Affordable

Customers continue to choose us because we provide sustainable, quality/fit-for-purpose gas at a price they are willing to pay through sound commercial decision-making, operational efficiency and safety, and exceptional customer service.

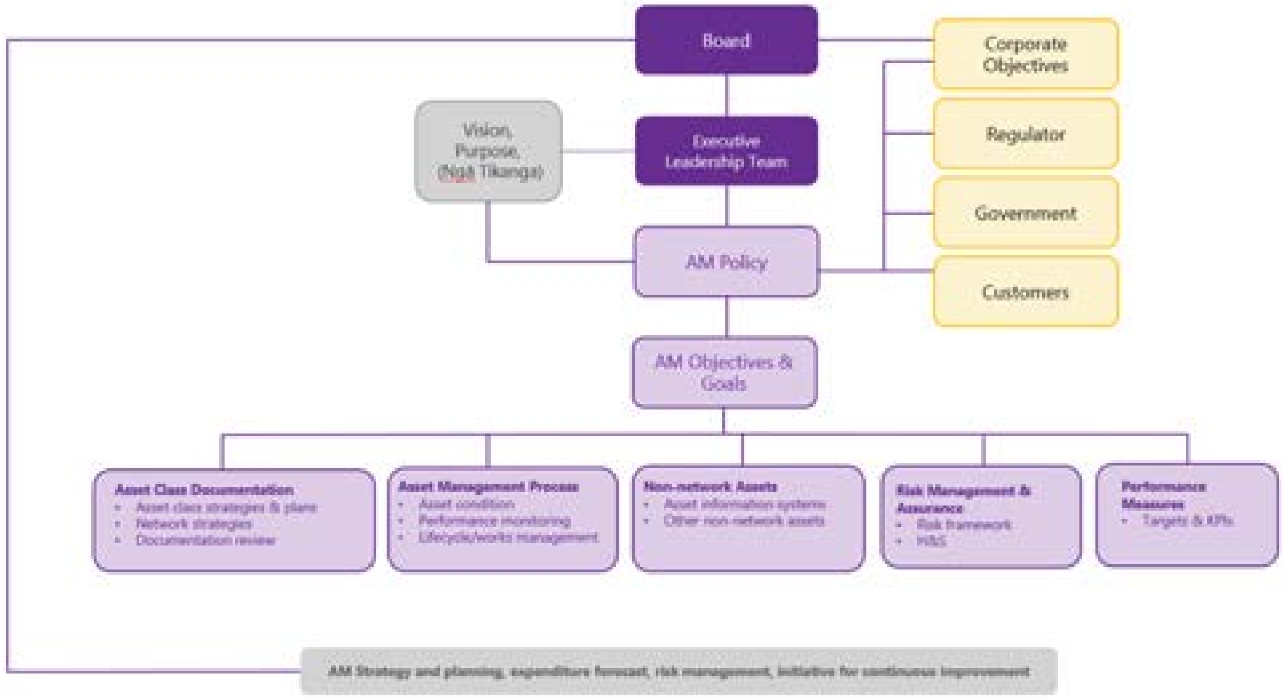
Trustworthy

We are trusted by our Board, people, Electricity industry, customers, contractors, suppliers, gas distribution businesses, regulators, communities and potential energy partners to collaborate to create Aotearoa's sustainable energy future in a way that works for us all.

4.3 Line of sight between our corporate vision and asset management decisions

Our Board and Executive Leadership Team (ELT) set the strategic direction through policies and corporate Objectives. Our AMS provides a line of sight between our Corporate Objectives, vision, and purpose. Our AMS is illustrated in Figure 4.5, and shows how all the parts of our business work together.

Figure 4.5: Our Asset Management System



4.4 Organisation and people

We maintain organisational roles, responsibilities, and authorities consistent with implementing our policies, strategies, and plans.

The Board

Our Board provides strategic guidance, monitors management effectiveness, and is accountable to shareholders for the company's performance. From an asset management perspective, it does this by endorsing key documentation, establishing our business objectives, approving the strategies needed to achieve those objectives, and monitoring our delivery to this.

The principal asset management responsibilities of the Board are:

- Accountability for maintaining a safe working environment and ensuring public safety is not compromised by our assets and operations.
- Reviewing and approving our AMP, including our medium-term (10-year) investment forecasts and shorter-term expenditure plans.
- Approving our annual gas capital and operational budgets based on allowances. This includes our prioritised Capital Works Plan, the allowance for reactive works, maintenance, System Operations and Network Support (SONS), and Business Support.
- Sanctioning individual operational or capital projects involving expenditure greater than $2m, and the divestment of assets with a value greater than $250,000.
- To guide management on improvements required, or changes in strategic direction. The Board does this through information received in monthly reports that include performance reports regarding the status

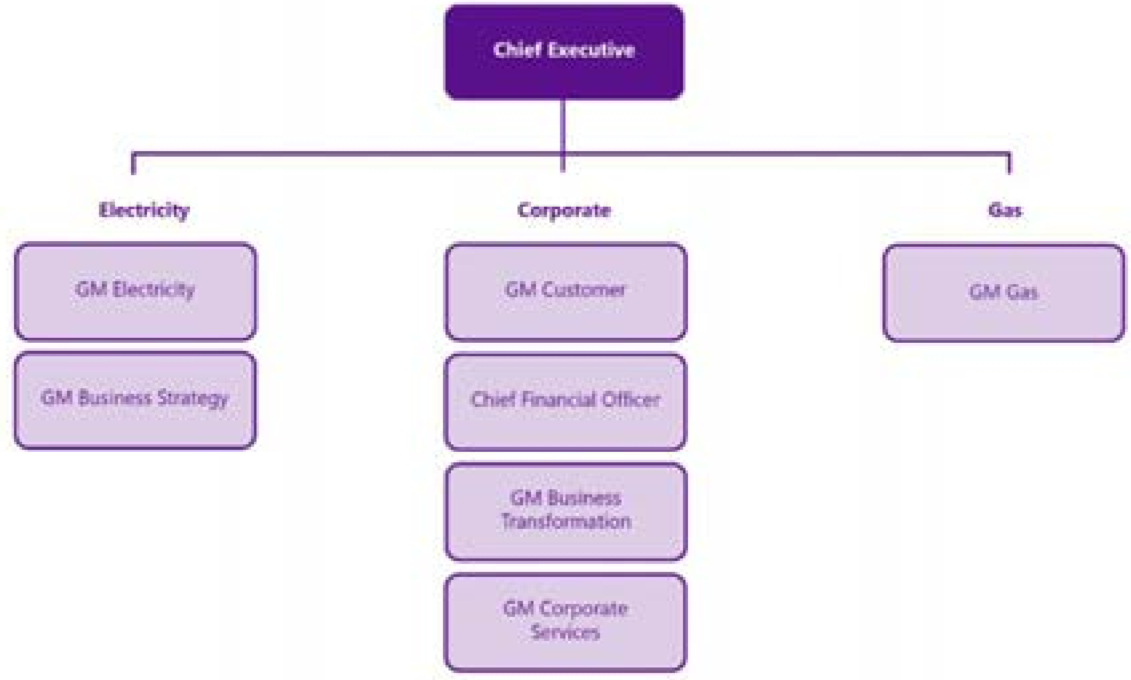
of key work programmes, key network performance metrics, updates on high-value and high-criticality projects, and the status of our top-10 risks. It also receives audit reports against a prescribed audit schedule.

- Overseeing risk management practices and reviews audit findings through the Board's Audit and Risk Committee.

The Executive Leadership Team

Our organisational structure is based on two asset management-focused units – the Electricity and Gas divisions – with the support of four functional units. The makeup of our ELT, which reflects this organisational structure, is illustrated in Figure 4.6. This structure allows the Gas division to focus on core activities and decisions and access specialist skills and advice as required.

Figure 4.6: Executive Leadership Team structure

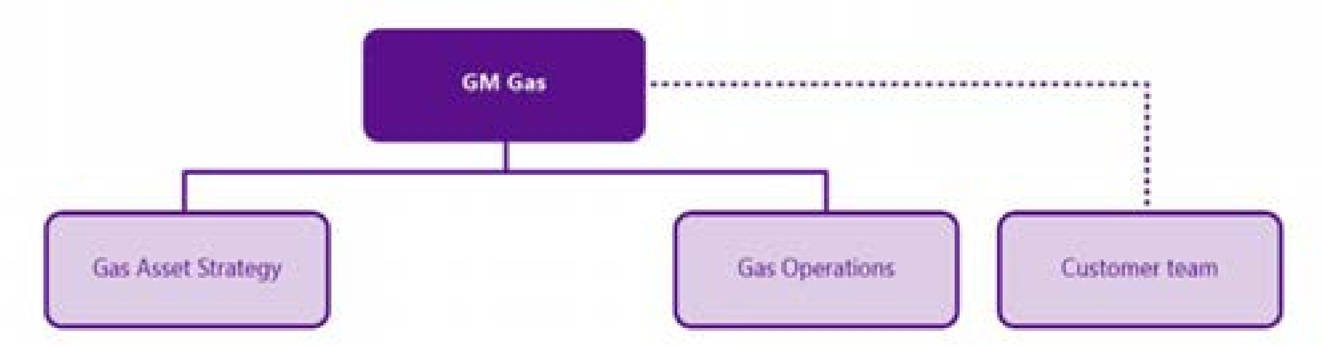


The Electricity and Gas divisions are responsible for asset investment, operational management, and commercial management of each business line.

Core gas organisation structure

The Gas division has specialised teams reporting to one general manager, as in Figure 4.7.

Figure 4.7: Gas division – Asset management responsibilities



Gas division

The Gas division's responsibility includes ensuring that the network assets are developed, renewed, maintained, operated and used sustainably and efficiently to meet the needs of all stakeholders. The following asset-focused groups report to the General Manager:

- **Gas Asset Strategy:** Responsible for the asset management function, which involves overseeing long-term activities on the network, sponsoring the asset strategy, and developing, monitoring and analysing asset objectives, performance and reliability. This group ensures the asset strategies are consistent with Powerco's other strategies and policies. The development of the AMP is part of this group.

- **Gas Operations:** Responsible for the preparation and delivery of work on the networks. This includes developing technical standards, design, operation and maintenance, and the management of the contractors working on the network.

- **Customer team:** Responsible for customer relationship management. This includes customer service, customer surveys, and account management of major users on the network. The team helps us maintain a high level of customer service, and assists our customers through the energy transition to a low carbon future.

Our customers are central to the business. Therefore, in 2022, the Gas Customer and Commercial team, responsible for customer relationship management, was merged with the Electricity Customer teams. This change has enabled us to work across the business improving the way we work with our customers and enhancing our ability to enable delivery of renewable energy solutions to customers when they are ready to transition.

Outsourced activities

Core asset management field work activities and support functions are outsourced to competent service providers. Because of the risks involved with field work, significant controls are in place to ensure the service providers undertake work safely. There are also considerable contractual controls in place to ensure all work is completed to the required level of quality, cost, and timeliness. Our approach to managing external contractors for the delivery of field work is mature and in line with industry best practice.

Internal support functions

The Gas division leverages the corporate support functions to assist with its asset management activities. These support functions include:

- Legal support
- Financial support

- Regulatory support
- Health, safety and environmental advice and support
- Processing of as-builts
- Provision of Information and Communications Technology (ICT) systems and services
- Management of facilities

Asset management governance

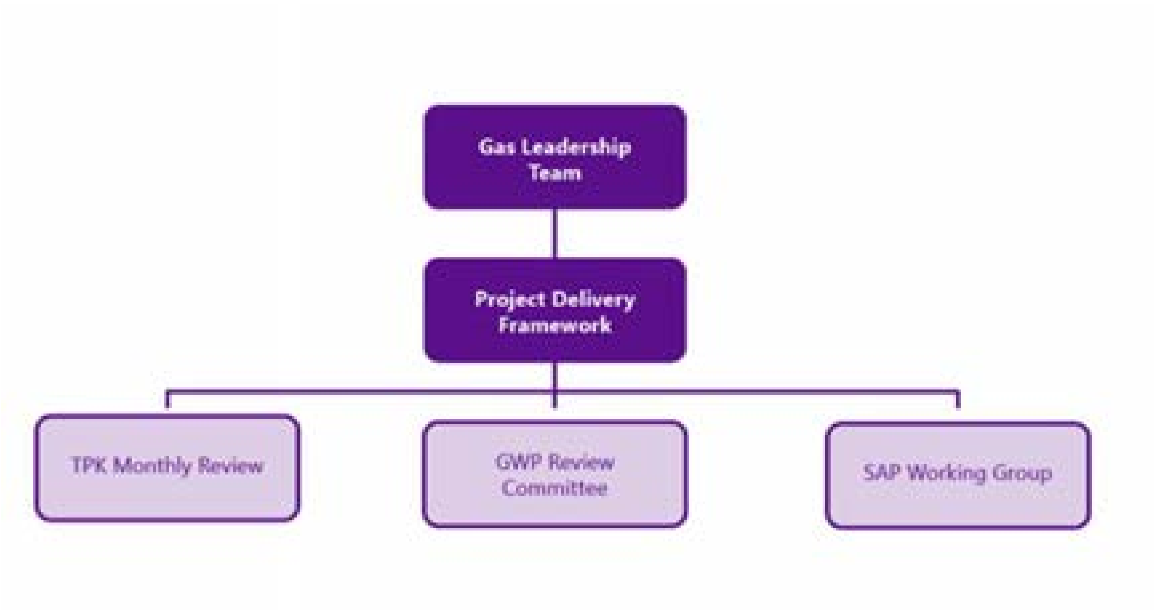
We have established an internal asset management governance group to ensure delivery of our Corporate Objectives, vision, and purpose. Our internal governance group is at the senior gas management (not Board) level. They are representative of our cross-functional teams, with a targeted mandate to lead, review, and report in particular areas.

Our asset management governance group provides a single point of control and governance for specific activities, ensuring key interactions, responsibilities and decisions are made across our business.

Gas governance groups

Our gas governance groups are illustrated in Figure 4.8.

Figure 4.8: Overview of gas asset management governance groups



Project Delivery Framework Committee

The Project Delivery Framework Committee is a gas senior leadership-level committee responsible for overseeing governance of our category one projects defined as high-cost (>$500,000) and high-complexity. It is accountable for, and provides strategic guidance and oversight to support the effective management and delivery of gas network projects during design and delivery phases.

Te Puni Kāpuni (TPK) Monthly Review

The TPK[11] Monthly Review group includes appropriate technical staff or engineers across the gas business with an in-depth technical appreciation of the standards and assets related to the network. Its primary role is to review all complex System Analysis Programme (SAP) data notifications and asset initiatives to prioritise future work. Priority works identified for the delivery pipeline are fed into the Gas Works Plan (GWP) process. The TPK process aims to allocate the right investment, at the right time, across the asset lifecycle.

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[11] The working document that represents the TPK Monthly Review process is known as the Te Puni Kāpuni (Issues Register)

Gas Works Plan (GWP) Review Committee

The GWP Review Committee is a gas senior leadership-level committee responsible for the review and approval of the GWP. The plan details all scheduled capital projects, complex operational expenditure (Opex) projects, investigations, and roll-over projects to be undertaken in the next financial year.

SAP Working Group

This group guides the governance of our SAP business data. It oversees and coordinates several data communities, from various parts of the business, who coordinate SAP initiatives to ensure consistency with system usage, maintaining a standard for ongoing data improvements and any changes related to SAP and the associated mobile workforce management solution (Blueworx).

Asset management planning responsibilities

We have six asset management planning activity levels, ranging from strategic direction by the Board and CEO to the approval of operations and maintenance expenditure by the Operations team. Each layer is designed to provide a clear line of sight between our Corporate Objectives and asset management activities.

Table 4.1 provides an overview of these expenditure planning governance levels.

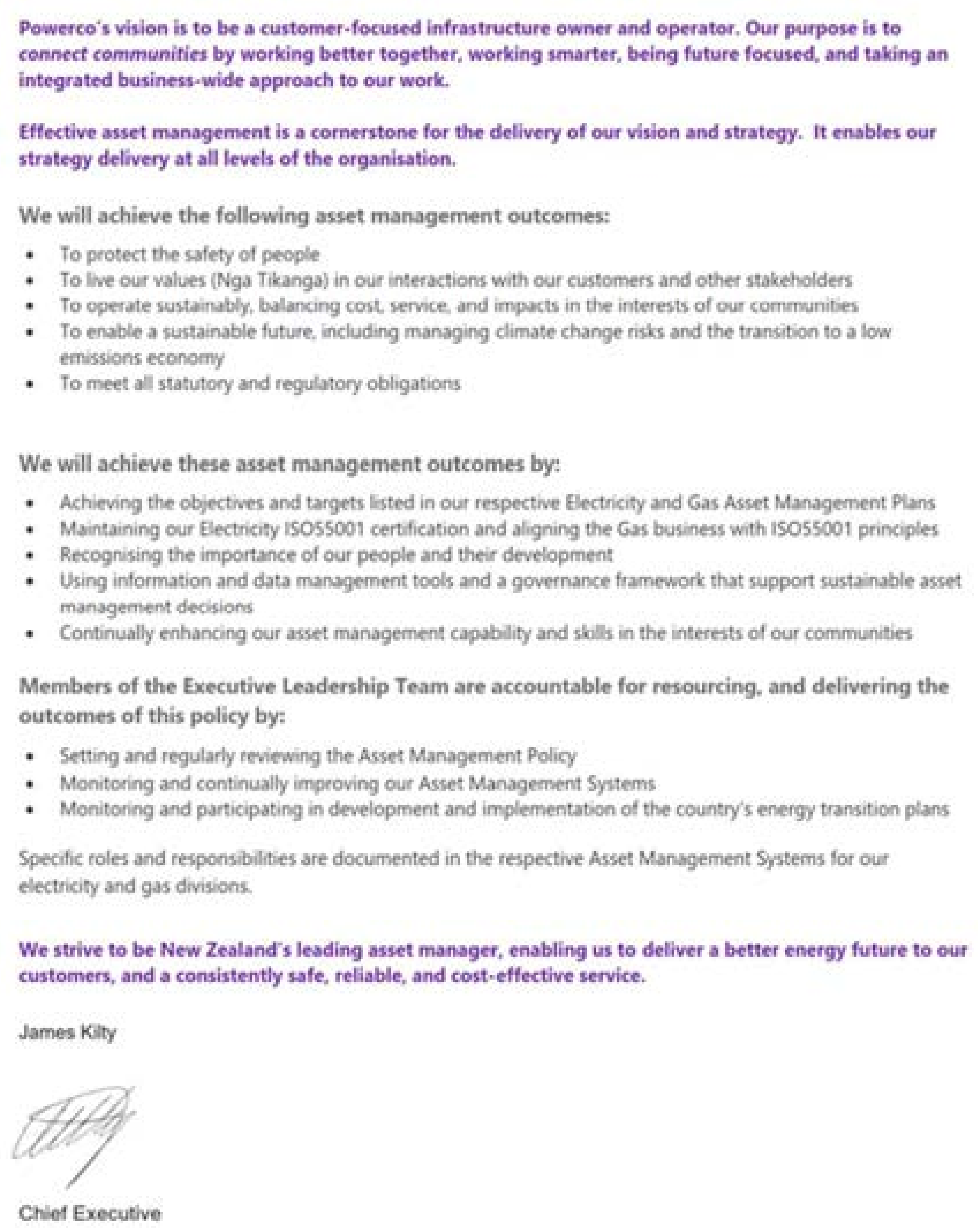
Table 4.1: Asset management planning responsibilities

Level	Purpose	Responsible	Documentation
Corporate Strategy	Setting high-level objectives and targets for the company.	CEO, executive	Ngā Tikanga, vision, purpose, Corporate Objectives, Asset Management Policy, Business Plan
Asset Management Objectives	Support Corporate Objectives, set Asset Management Objectives, and goals.	GM Gas	Asset Management Plan
Asset Management Plan	A summary of our strategies and plans for providing a safe, reliable, resilient, and cost-effective gas supply for the next 10 years.	GM Gas	Asset Management Plan
Te Puni Kāpuni (TPK) Planning	Detailed planning of project needs registration and prioritisation (gives effect to the 10-year investment plan for future delivery).	Gas Asset Strategy Gas Operations Contract & Field Services	SAP notifications Te Puni Kāpuni (Issues Register)
Gas Works Plan (GWP)	The GWP defines the list of projects to be delivered in the next financial year.	Gas Asset Strategy (with Gas Operations support)	Annual GWP approved document Investigation reports, project briefs Maintenance plan, non-network plan(s)
Works Delivery and Field Operations	Oversight of capital project and maintenance delivery.	Gas Operations Gas Projects Delivery Contract & Field Services	Project delivery framework Gas project brief Gas Leadership Team reports Monthly Board reports

4.5 Asset Management Policy

Our Asset Management Policy is central to our Asset Management Plan. It highlights the expectations of our Board of Directors and management regarding how we will manage our assets and make decisions, while reflecting our strategic corporate direction. It has also been developed to ensure we continually focus on delivering the service our customers want and need in a sustainable manner that balances risk and long-term costs. Our Asset Management Policy is shown in Figure 4.9.

Figure 4.9: Our Asset Management Policy



Powerco's vision is to be a customer-focused infrastructure owner and operator. Our purpose is to *connect communities* by working better together, working smarter, being future focused, and taking an integrated business-wide approach to our work.

Effective asset management is a cornerstone for the delivery of our vision and strategy. It enables our strategy delivery at all levels of the organisation.

We will achieve the following asset management outcomes:

- To protect the safety of people
- To live our values (Nga Tikanga) in our interactions with our customers and other stakeholders
- To operate sustainably, balancing cost, service, and impacts in the interests of our communities
- To enable a sustainable future, including managing climate change risks and the transition to a low emissions economy
- To meet all statutory and regulatory obligations

We will achieve these asset management outcomes by:

- Achieving the objectives and targets listed in our respective Electricity and Gas Asset Management Plans
- Maintaining our Electricity ISO55001 certification and aligning the Gas business with ISO55001 principles
- Recognising the importance of our people and their development
- Using information and data management tools and a governance framework that support sustainable asset management decisions
- Continually enhancing our asset management capability and skills in the interests of our communities

Members of the Executive Leadership Team are accountable for resourcing, and delivering the outcomes of this policy by:

- Setting and regularly reviewing the Asset Management Policy
- Monitoring and continually improving our Asset Management Systems
- Monitoring and participating in development and implementation of the country's energy transition plans

Specific roles and responsibilities are documented in the respective Asset Management Systems for our electricity and gas divisions.

We strive to be New Zealand's leading asset manager, enabling us to deliver a better energy future to our customers, and a consistently safe, reliable, and cost-effective service.

James Kilty

Chief Executive

4.6 Asset Management Objectives

Our Asset Management Objectives are corporate-led and set the direction for managing our gas network assets. Our Asset Management Objectives for gas assets:

- Support the delivery of the best value to our customers while sustaining an appropriate commercial return for our shareholders.
- Help us achieve our core function as a lifeline utility by safely and reliably delivering gas to our customers.
- Drive our continuous improvement programme to ensure we continue to be an efficient, forward-thinking network business.
- Ensure our asset management practices deliver the Corporate Objectives.

Our Asset Management Objectives are at the heart of how we manage our assets. They reflect our lifecycle asset management approach, which considers all aspects of asset decision-making and activities from inception to decommissioning. They are in alignment with our Volume to Value Strategy that aims to balance cost, risk, and performance, to determine the best investment opportunity, while considering the remaining life of the asset and the optimum time to intervene. Our Asset Management Objectives are illustrated in Figure 4.10.

Figure 4.10: Our overarching Asset Management Objectives

Asset Management Objectives
Set high-level goals targets for assets

Safety and Environment

Protecting the public, our staff, our service providers and the environment from the inherent risks posed by a gas network sits behind everything we do.

Customers and Community

We provide an essential service to our communities. We do this based on our customers' requirements and preferences.

By reflecting this in our asset management planning, we ensure that we have....

Networks for Today and Tomorrow

We will continue to develop secure and enduring energy supplies that will meet our customers' needs reliably and efficiently, now and in the future.

To keep the network performing as designed, we will promote excellence in ...

Asset Stewardship

We operate a large number of diverse asset, which we will manage efficiently and keep in good health.

By achieving all of this, we will ensure the highest level of ...

Operational Excellence

Good asset management helps us deliver a cost-effective, safe, and reliable service to our customers. We continuously improve and develop our people, systems and processes.

Safety and Environment

Our Asset Management Policy reaffirms that the safety of the public, our staff and service providers is paramount. We are committed to developing the leadership, culture, and systems to support our drive to minimise harm.

We see ourselves as responsible custodians of our environment. To support this, we encourage the efficient use of energy, ensure sustainable business practices (also for our suppliers), strive to minimise our carbon footprint, and help our customers achieve a sustainable energy future for Aotearoa by being a trusted partner of choice.

Safety and Environment: Overall objectives

Our overall safety objectives are to safeguard the public from any harm from our assets and to ensure an injury-free workplace.

Our overall environment objectives are to cause no lasting harm to the environment and to reduce our carbon footprint. We also have a commitment to reduce and offset our target emissions over the short to medium terms by undertaking our first round of gas leak detection, using new equipment that will provide more accurate data to determine specific emissions mitigation options and using the MarcoGaz leakage model.

Worker safety

We are committed to keeping people safe and well. Worker safety applies to both our employees and employees of our service providers. We aim to deliver an empowered workforce, which prioritises safety and wellness through risk management and working in a cooperative and consultative manner.

We work alongside our service providers to better understand risks and the most effective ways to control them. We share these findings widely, as it is critical in delivering the safest outcomes.

Customers and Community

Our core business is to ensure a safe, reliable, resilient, and cost-effective gas supply is delivered to our customers. Therefore, our customers' priorities guide our investments. Achieving this requires balancing:

- Investment in the network to ensure it remains in an appropriate condition, has sufficient capacity and functionality to meet customers' current and future needs.
- Customers' individual experiences in the short term as we deliver our investment programme and service their day-to-day gas needs.

Our Customers and Community objective is one of several objectives that set the direction for how we deliver our service.

Customers and Community: Overall objective

Ensure Customers and Community preferences are reflected in the provision of a safe, reliable, resilient, and cost-effective gas supply that is future-ready and affordable.

Networks for Today and Tomorrow

Our gas network provides a lifeline utility service to communities. Safe, reliable, resilient, and cost-effective gas supply is essential to the economic and social wellbeing of our customers.

Our network needs to be capable of supporting and meeting our customers' evolving energy requirements and service level expectations, as well as providing a flexible transition towards a low carbon future that is affordable for all Kiwis. This means ensuring that we can support those customers who choose gas as their preferred energy solution, and those who wish to partner with us to develop new renewable energy solutions.

Networks for Today and Tomorrow: Overall objective

We will continue to provide our customers with a safe, reliable, resilient, and cost-effective gas supply that will reflect customers' preferences and meet customers' needs today and in the future, including the transition towards sustainable low carbon renewable energy options.

New technology

Investment in new technology enables a continued focus on improvements, ensuring a safe, affordable, sustainable, resilient, and reliable network that will also benefit customers. These investments also support the assessment of network capability to transition towards decarbonisation, when implementing new technology is found to be practicable and cost-effective. Current and recent investments include:

- Vehicle-mounted leak detection and survey equipment. The purchase of our first leak detection vehicle will alert us to leaks before the public reports them, allowing us to intervene sooner. Using this new equipment will provide more accurate data to determine specific emissions mitigation options, with analysis using the MarcoGaz leakage model to reduce emissions.
- Data loggers. Investigating the purchase of new data loggers to measure network pressure. These will replace the existing fleet, which will become obsolete from 2025 when the 2G cellular network is decommissioned. We will install and test a set of new units in FY23, before investing in the replacement of the entire fleet.
- Ravetti Flowstop and Lockring equipment. Used in the management of our small-bore steel pipelines, this technology allows safe isolation while delivering repairs or network extensions. Acquisition of this technology is now complete, and we are developing training packages for our service providers.
- Friartec/TD Williamson flow stopping equipment. We completed an options analysis on available flow stopping equipment to determine the most suitable option for our polyethylene networks. The Friartec Ballon system was selected as it provides an increased range of application (i.e. bore size). We are procuring this equipment and aiming to roll out training to our frontline service providers as available.
- A smart meter project is under way to deliver the replacement of 45,000 meters for Genesis gas customers. The installation of the smart meters will allow Genesis (the contracted retailer) the ability to capture and record customer data daily, and remove the need for any estimated data reads. The project is due to be completed at the end of 2024, increasing our residential meter fleet by 20,000 meters.

Asset Stewardship

Our gas network is extensive and comprises assets of varying age and condition. Looking after these assets efficiently is essential to delivering a safe, sustainable, resilient, reliable, and cost-effective gas supply.

Good stewardship of long-life assets requires a thorough understanding of their performance and condition. We monitor and maintain assets to ensure they deliver to their required specification over their life and replace them at the appropriate time. Good asset stewardship also requires us to be prudent operators, ensuring an asset does not operate outside capacity limits or be used in unsafe ways. Maintaining operational reliability is a key focus. To stabilise and manage deteriorating performance trends, such as leakage rates, we prioritise investment in asset renewal and our maintenance programmes.

Asset Stewardship: Overall objective

Through effective management and operation, our assets deliver a safe, reliable, resilient, and cost-effective gas supply to customers by prioritising the right investment, at the right cost, over the full expected asset life.

Operational Excellence

Operational Excellence is a broad concept that covers many of our activities. From an asset management perspective, striving for Operational Excellence has relevance to the following areas:

- Putting in place the skills, capacity and supporting systems needed to achieve good practice asset management and service delivery, including network operations, asset maintenance and construction.
- Cost-effectively delivering services to customers according to their needs.
- Effective engagement with stakeholders, including providing accurate performance reports and asset information, supporting regulatory submissions, and preparing high-quality material to aid company governance.
- Excellence in asset and network data collection, the management and safekeeping of this data, and the processing and analysis of data and information to support effective decision-making.
- Increasing efficiency within our planning and delivery processes to ensure the best value is achieved from our operations.
- The efficiency of our service provider management.

Operational Excellence: Overall objective

Ensure we have the skills, capacity, systems, and processes to deliver our strategies in a safe, reliable, resilient, and cost-effective way while improving our asset management performance.

Asset management performance

We are continually striving to improve our asset management capability. We have clear corporate-led Asset Management Objectives that the gas and electricity businesses have adopted.

While the electricity business achieved provisional ISO: 55001 certification during FY22, the extra cost to obtain certification for the gas business, and to maintain that certification, was deemed prohibitive. However, we are aligning the gas business Asset Management System to the ISO: 55001 requirements. Aligning ourselves to the corporate-led Asset Management Objectives was the first step in this process.

The Asset Management Maturity Assessment Tool (AMMAT)[12] is a prescribed set of questions identified by the Commerce Commission for the self-assessment of Gas Distribution Businesses (GDBs) asset management performance and maturity. The Commerce Commission developed the tool to help all GDBs and stakeholders to assess and understand their performance and to encourage continuous improvement.

2023 AMMAT assessment

The results indicate our approach has progressively matured, as evidenced by the gradual increase in our AMMAT score from 2020-2023. The increased scores reflect our alignment with the corporate-led Asset Management Objectives to ISO: 55001 requirements, and focused attention on improving and documenting our programme planning in line with those principles within our AMS. Our 2023 assessment is summarised in Figure 4.11 and further details about our asset management maturity can be found in Schedule 13.

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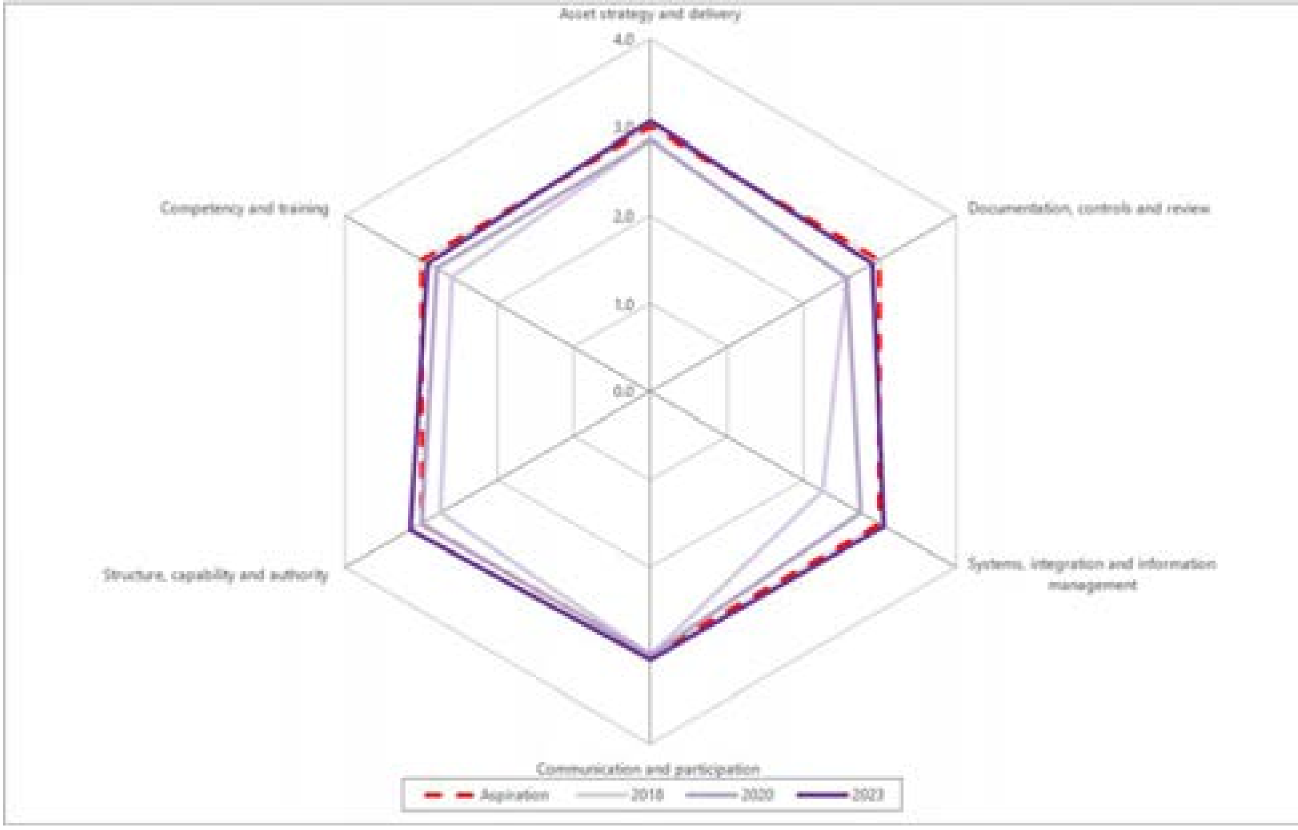
[12] As it is a regulatory requirement, our AMMAT assessment for the 2023 AMP is provided in Appendix 13.

Figure 4.11: Asset management maturity assessment 2023



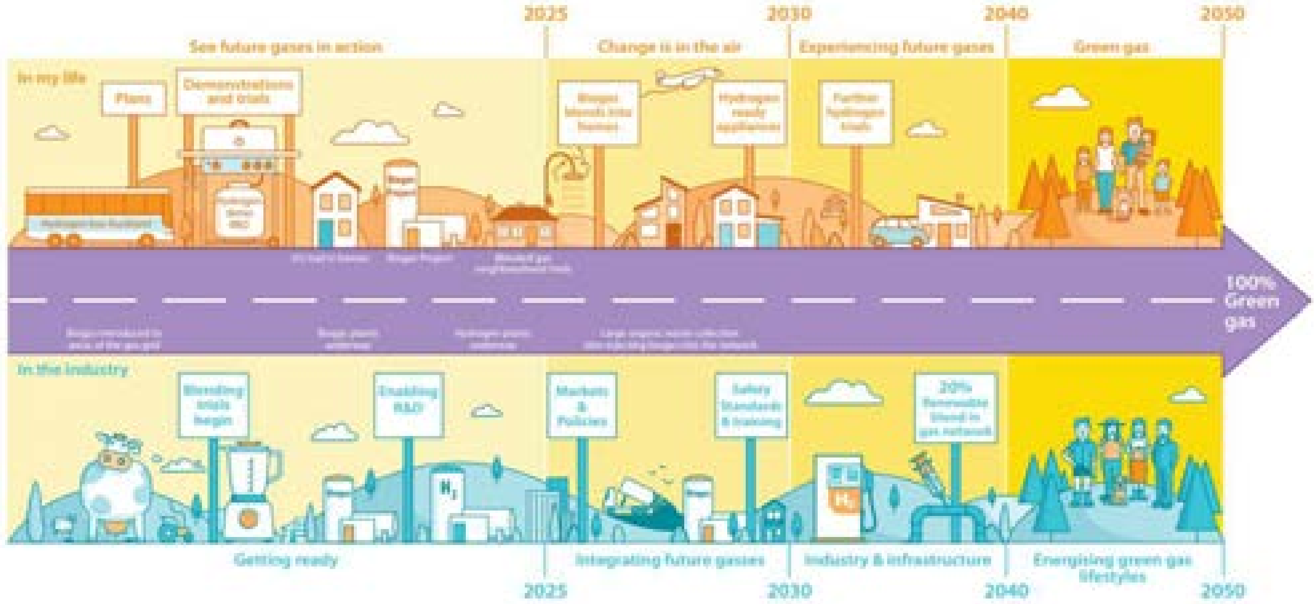
4.7 Future-focused strategies

Our world is changing rapidly, and we are considering how to support and enable a sustainable transition to a low emissions energy future. Our low carbon transition strategy for the gas network and Volume to Value Strategy outline how we are considering lower carbon options.

Low carbon transition strategy for the gas network

As the focus of customers and policy makers moves towards decarbonisation, natural gas remains an integral part of the energy mix to meet future energy needs and is the perfect complement to the renewable energy system of the future. To support New Zealand to decarbonise, we have developed our own roadmap to 100% green gas. Our roadmap in Figure 4.12 centres on repurposing the gas network to enable distribution of mixed gases, such as biogas and hydrogen, including initiatives that will support the transition.

Figure 4.12: Roadmap to 100% green gas



Our intention is that our roadmap to 100% green gas will become a living document, which will be updated and adjusted as opportunities and challenges are identified, or when a change in direction, strategy or initiative is required.

Our strategy to enable change for a renewable energy future

In response to customer, Government, and climate changes reshaping the energy landscape, we have introduced a strategy to support the transition to a renewable energy future while maintaining the value of our assets. We call this our Volume to Value Strategy. We believe that to ensure a safe, reliable, resilient, and cost-effective energy source for Kiwis, we need to focus on: prioritising the right investment, maintaining our asset base, and expanding into a renewable future state.

By extracting the value of our core assets, we ensure that we gain the greatest benefit from investments made in our infrastructure. By exploring different options available to us, we can provide what our customers need today and into the future for low emissions, low cost energy. In addition, by ensuring that our investments are focused on the right asset at the right time for the right cost, we are able to maintain optionality and maintain our assets to deliver green fuel in whatever form is needed.

Figure 4.13: Volume to Value Strategy

Volume to Value Strategy

The volume to value strategy is linked to the service we provide our people, customers and shareholder.
It also protects our core business and drives value, efficiency and risk reduction.

To facilitate the transition horizon towards a low carbon renewable energy future we're considering different options when undertaking investment decisions.

Replacement is focused on the

Right asset - Right time - Right cost

4.8 Our asset class documentation

Delivering our gas performance objectives requires the right balance between expenditure on maintenance and investment in renewals. We consider the whole of life cost of these assets and the required interventions during the assets' lifecycle to ensure the balance is appropriately managed between competing drives of risk, performance and cost.

Our established asset management process takes a risk-based approach to maintenance and renewals, and this is incorporated into our:

- Asset class strategies and plans
- Network strategies
- Non-network strategies
- Asset information systems

Asset class strategies and plans

We manage a range of different assets each with unique risks, operating procedures, expected lifespans and failure modes. The asset class strategies and plans describe how often the asset is operated, inspected, and maintained.

We have asset class strategies and plans that inform the lifecycle activities for all our major asset types. These are:

- Main and service pipes
- Regulator stations
- Line and service valves
- Special crossings
- Monitoring and control systems
- Cathodic protection systems

Each asset class strategy and plan account for the lifecycle of the asset. They outline the condition of our assets, our approach to renewal programmes, operations and maintenance, renewal, and expenditure, as well as information quality. They also discuss our current understanding of any systemic issues. Programmes of work are identified and are broken into specific projects as part of our annual GWP and investment process, which considers each element of the asset lifecycle. The work is then scheduled for delivery.

The asset class strategies and plans are developed by analysing the:

- Asset class quantities and age profile
- Asset class life expectancy
- Asset class condition

This process ensures that the investment and programme of works identified are aligned with our corporate strategic direction and Asset Management Objectives.

Network strategies

We operate networks in five regions, each with different operating characteristics, customers and, therefore, operating risks. The network strategies for our operating parameters include:

- Pressure droop
- Elevated pressure
- Resilience and redundancy
- Odorant
- Network isolation
- Rationalisation

Assessments of the networks are conducted under the limitations dictated within these strategies. These assessments identify areas of the networks to be worked on to mitigate the identified risks. These areas are broken into specific projects in the Network Plans.

Pressure droop strategy

Poor pressure events on the network may result in customers losing supply of gas. As such, it is important to be able to detect and prevent any poor pressure event, under typical network operating conditions. Droop characteristics for each network are recorded and captured as part of normal operating procedures, and these values are utilised to determine how the network is operating. Limits on acceptable droops have been set and are maintained to ensure customer interruptions are limited in normal operation.

Elevated pressure strategy

Elevated pressures on the network may cause damage to, or failure of, Powerco or customer assets. This is potentially dangerous, therefore strict limits are placed on the maximum allowable operating pressure to ensure safe operation. Network performance is reviewed regularly to ensure safety systems are in place and operational safety measures are undertaken. Elevated pressures are normally due to upstream issues, so most measures undertaken will see valves automatically close and an alarm raised.

Resilience and redundancy strategy

Failure of assets is inevitable, but to ensure that customers do not lose gas supply, some redundancy must be designed into the network. Minimum requirements for network design help ensure that a single asset failure will not affect a large number of customers.

Odorant strategy

We ensure odorant is present to enable natural gas leaks to be detected. We assess the growth of our network and location of our test points on a regular basis, to ensure our testing regime is effective.

Network isolation strategy

In the event of a large asset failure, we must have the ability to isolate the flow of gas to the damaged area. The N Strategy has been developed to ensure that neither the public nor Powerco is exposed to undue risk in the event of an asset failure. Where appropriate, isolation ability is designed into the network.

Rationalisation strategy

We have accumulated networks throughout our corporate history. Accordingly, we have inherited different design philosophies and practices. These are sometimes at odds with current thinking, or our desired network state. To ensure network designs are efficient and consistent, rationalisation strategies have been developed for each region. These include:

Documentation review

Our Information Management Policy established our commitment to managing the creation, storage, use, application, distribution, and disposal of information in compliance with legislative requirements. This supports business operation and efficiencies.

This is supported by our documented Information Management Standard, which defines our framework for the management of documents. It provides the criteria for categorising documents, how these categories (uncontrolled, managed and controlled) are to be treated, naming conventions, access controls and version protocols.

4.9 Asset management processes

Our asset management processes ensure that we manage our assets to meet our overall Corporate Objectives.

Asset condition

We routinely inspect and test our assets in the field to understand their condition. With most of our assets being underground, we use several assumptions, and mechanisms in our annual assessment of asset condition including:

- Asset age.
- Number of defects identified per asset class.
- Volume to Value Strategy and investment tool.
- Number of leaks identified using new technology, such as the leak detection vehicle.
- Direct current voltage gradient (DCVG) survey.

Asset condition reflects an asset's expected remaining life and is a proxy for the probability of failure. Factors such as age, location (e.g., high-density community area), defects, observed condition, measured, or tested condition, and known reliability of performance are combined to determine the right time for intervention. To indicate the condition of our assets, we utilise a standardised grading system devised by the Commerce Commission. The average age of assets is included in assessments to indicate the overall health of the assets. These grades give an overall indication of the condition of our assets or groups of assets, described below.

Table 4.2: Condition grading definition and application

Grade	Status	Definition
Grade 1	Poor	End of serviceable life, immediate intervention required. Intervention planned in next planning cycle or completed through reactive project.
Grade 2	Fair	Material deterioration but asset condition still within serviceable life parameters. Intervention likely to be required within three years.
Grade 3	Good	Normal deterioration requiring regular monitoring.

Grade	Status	Definition
Grade 4	Good	Good or as-new condition.
Grade unknown		Condition unknown or not yet assessed.

Performance monitoring

Asset performance plays a critical role within Reliability Centred Maintenance (RCM) and asset renewal planning. Table 4.3 and Table 4.4 describe our standard performance assessments and how they are applied to the respective asset classes.

Asset performance is monitored through defects. Results are analysed in our asset performance models. This may lead to adjustments to standards through our asset class strategies and maintenance programme, and/or create renewal projects.

Table 4.3: Performance assessments

Assessment	Description
Material testing	Laboratory testing of material performance and failure.
Leakage surveys	Detection of leaks in the near vicinity of the asset.
Safety assessments	Analysis of asset safety risks, including formal safety assessments.
Condition assessments	Visual inspection of asset condition.
Monitoring alarms	Fault and warning alarms from monitoring systems.

Table 4.4: Performance measures

Performance measures	Main and service pipe (M&S)	District regulator station (DRS)	Line and services valves (VAL)	Special crossings (SPX)	Monitoring and control system (MCS)	Cathodic protection systems (CPS)
Material testing	X	X	X	X		
Leakage surveys	X	X				
Safety assessments		X		X		
Condition assessments		X	X	X	X	
Monitoring alarms		X			X	X

Lifecycle management

Holistic asset management considers every stage of an asset's lifecycle, including develop or acquire, design and construction, operation and maintenance, and disposal. Our asset strategies and lifecycle plans consider:

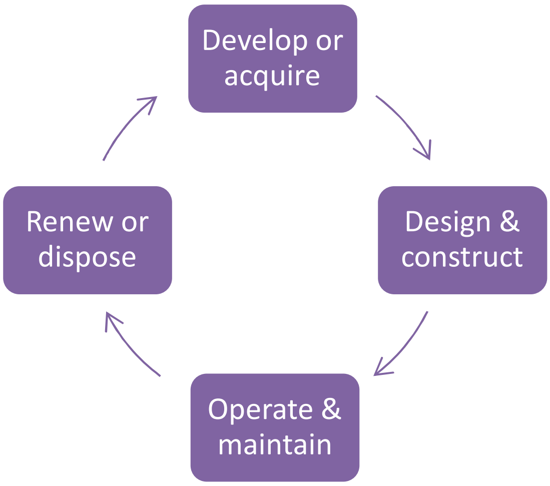
- The means to achieve safe, cost-effective, reliable operation.
- Maximising the value of an asset over its lifecycle.
- The ongoing operational, maintenance and refurbishment costs over the expected life of the asset.
- The complexity and cost of decommissioning and removal.
- Any possible environmental impacts at all stages of the asset lifecycle.

Lifecycle management of each asset class determines how we intervene with the asset. We utilise a RCM strategy for an asset's maintenance scheduling. Our RCM strategy requires us to understand our asset class risks, in conjunction with current asset class performance, to develop our asset intervention plan(s) for each asset class. Asset intervention includes when and how we:

- Operate the asset
- Maintain the asset
- Renew or replace the asset
- Dispose of the asset

Our asset management lifecycle is shown in Figure 4.14.

Figure 4.14: Asset management lifecycle



Develop or acquire

The GWP identifies an issue in the network to be addressed along with a brief scope. This becomes the responsibility of the gas operations Projects Delivery team to complete an assessment of potential options and prepare designs for delivery. Under the Volume to Value Strategy, an existing asset may be replaced or refurbished (develop) or a new asset installed (acquire). The preferred option will address:

- Asset renewal and replacement
- System growth and capacity
- Quality of supply, such as rationalisation, resulting in a more efficient and optimised network
- Other reliability, safety, and environment items, such as valve retrofits, new isolation valves and sectorisation
- Customer connections and relocations of existing assets
- Future network needs, such as green gas options and solutions

Design and construct

This comprises detailed design, tendering, construction and project management, commissioning, and handover of new assets to the operational teams. Our engineering design and construction standards establish the requirements for this process.

Using the project gas management framework, projects are broken into the following five phases and utilise stage gates between each phase to ensure adequate oversight. Management approval is required to proceed through each phase of the framework. The project lifecycle phases are:

- **Initiate phase**, which begins when a need has been identified within the Te Puni Kāpuni (Issues Register), assessed against our decision-making criteria and assigned to the Projects Delivery team. Information is gathered to gain an understanding of the project goals, complexity, cost, and timeframes. This information is collated in a project charter where the scope is defined, and a governance category is assigned. This category dictates the thoroughness of project management and documentation required throughout the remaining project phases.

- **Select phase**, which develops the project concept into a preferred solution. The preferred solution must be justifiable, and most often that justification is articulated though an options analysis. The options analysis determines and outlines the preferred solution by assessing all feasible solutions against our decision-making criteria, environmental impact, constructability, and Volume to Value Strategy.
- **Define phase**, which develops the preferred solution into a ready for construction package. The key components of this include approved detailed design drawings, a project scope of work, and a contract package including procurement of any long lead items.
- **Execution phase** is where a service provider is selected, the contract is awarded, and construction is completed.
- **Closure phase** begins when construction is physically completed. It confirms that all expected results have been achieved by the service provider as part of the project close out report process.

Operate and maintain

This covers the operation and maintenance of our gas assets. It aims to ensure the safe, sustainable, resilient, and reliable performance of our assets over their expected lives. This is discussed in detail in Chapter 6.

Renew or dispose

The decision to renew or dispose is considered when an asset becomes unsafe, obsolete, or where it would cost more to maintain than to replace. Our Volume to Value Strategy has a strong influence on the optimum time for renewal of an asset. This is a net present value (NPV) investment tool used to identify and test alternative options. It determines the best investment opportunity while considering the remaining life of the assets as we work towards New Zealand’s 2050 zero-carbon targets.

Works programme development

Our GWP is approved by the Gas Leadership team on an annual basis. It is generally a compilation of the highest priority works identified at the time, but also includes rolled over portions of larger and/or multi-year projects that may have included investigations. Asset-related work identified in the asset class and network strategies are grouped into projects and scheduled into an upcoming GWP.

From our network needs analysis we develop at a high level a long-term 10-year view of required works. The work for the earliest three to five years is developed in more detail, while work identified for delivery in the immediate financial year is fully scoped and designed for delivery.

The projects in the GWP are optimised against our value drivers to ensure greatest benefit to our customers and greatest reduction in network risk. We endeavour to deliver a smooth work programme, without step changes in activity, provided we have the resources available to achieve this and our ability to efficiently deliver is maintained. We also review the best way to deliver each project in terms of internal and external resourcing and cost efficiency to complete any investigations, project justifications or designs.

Our contract structure allows us to use alternative contractors or seek competitive tenders for work if a project requires specialist work or the cost is expected to be more than $150,000. Within reasonable limits, there is usually flexibility to move the timing of projects to reflect resource, or factors such as the delivery timeframe to plan the works around preferred construction seasons or availability of long lead time components.

Planned activities

Planned activities are driven by our accepted risk levels, the value drivers and the targets established for each objective. If we consider that our current or future risk levels, in terms of our value drivers, are outside acceptable limits, we will include them in a new project with an indicative delivery date in the Te Puni Kāpuni (Issues Register).

Optimisation and prioritisation

Only top priority projects are entered into the GWP. To populate the GWP, the Te Puni Kāpuni (Issues Register) is reviewed, and investment opportunities are prioritised against the value drivers. The projects are given weightings against each value driver, and the top priority opportunities are then incorporated into the GWP.

Decision-making framework

We have developed a set of decision-making criteria to prioritise intervention decisions. These reflect our overall corporate strategic direction and are:

- **Safety:** Keep the public, our staff, and our contractors safe from harm.
- **Delivery:** Ensure our networks have the capacity and resilience to meet the quality of supply expected by our customers.
- **Reliability:** Safe containment of gas and operational reliability to deliver gas to our customers at the right quality.
- **Efficiency:** Continuously seek out and deliver cost efficiencies. Focusing on our Volume to Value Strategy by prioritising the right investment, maintaining our asset base, and expanding into a renewable future state.
- **Partnership:** Be a responsible sustainable and resilient future energy-focused partner of choice for our customers and our other stakeholders.

Works management

Operation of the assets and networks is arguably the most important facet of our business. It is imperative that works are delivered and are conducted safely. There are two main works delivery streams that are used to ensure work is completed to a high standard and in a safe, sustainable, and affordable manner. They are:

- Works mastery
- Safety leadership.

Works mastery

Balancing cost, scheduling and quality is the essence of our successful project and work delivery. For large scheduled Capex projects, our Projects Delivery team follows our Project Management Framework to ensure the work programmes are designed and constructed according to the relevant Powerco gas standards, industry regulations, council requirements and safety legislation. By compiling groups of projects together by asset class, such as mains replacement, regulator station replacement or refurbishment, valve replacement and cathodic protection, lessons can be learned and passed on to future projects.

Safety leadership

Our Engineering team adheres to the Safety in Design concept when designing solutions to the technical challenges in each project. By considering the health and safety outcomes throughout the lifecycle of the new asset, it becomes easier for our construction crew to install the asset, carry out regular maintenance, and eventually decommission the asset at the end of its technical lifecycle in a safe manner. An example is the installation of valves on berms as opposed to in the middle of the traffic carriageway. This avoids the need for specialist traffic management for the construction crews to install and to do scheduled inspections.

Another aspect of safety leadership is the project manager and auditors carrying out site safety audits at critical milestones of the construction phase. This ensures that gas safety fundamentals are being followed and any non-routine works, such as hot-tapping, flow stopping and bypassing, are being carried out as per the agreed methodology.

Operation and maintenance

Our maintenance activities are driven by standards, which are in alignment with industry standards. They often prescribe minimum inspection frequencies and ensure the safe operation of the network, but also offer the possibility to use a risk-based approach. In recent years, our internal standards have evolved towards a risk-based approach. They follow the principles of reliability centred maintenance (RCM) aimed at further improving the efficiency and optimisation of our asset lifecycle management. This may lead to a change in the frequency of leakage surveys and inspections, or type of operation/maintenance activity performed.
Our routine maintenance and inspection programmes are planned at asset class and regional levels. Normal operational condition and maintenance activities are specified in the standards prepared by the Operations team and managed through SAP, a single integrated software system that connects its financial and works management (projects, maintenance etc) systems.

Customer-initiated Works (CIW)

Residential requests come directly to the Customer team from individuals or through their retailers. Most CIW have standard designs and procedures applied. Our customer contribution policy is used to identify the costs to be passed on to the customer. Other CIW (commercial, subdivision reticulation etc) go through the same process as capital works, with commercial oversight and justification provided by the Pricing and Revenue Manager.

Third-party requests

Pipe relocations or alterations are reactive activities driven by third-party requests, such as subdivision developments, and therefore cannot have plans created for them. However, the programme budget is managed accordingly, and prioritisation of projects is utilised if scheduled projects need to be halted. They come directly to, and are dealt with, by the Projects Delivery team. Most of these activities can have their costs recovered, as provided for by the Gas Act 1992.

These activities will be funded from our existing forecasts, as part of our business-as-usual continuous improvement activities.

Procurement process

We procure larger items such as district regulator stations (DRS), specialist material, and large quantities of pipe etc, directly for larger projects. We also directly tender civil works where it makes sense to do so. Procurement of minor items is left to the contractor to ensure a smooth workflow.

We tender all works of significant scale (typically >$150,000) and can do the same for specialist works. Our ability to benchmark tender outcomes provides strong confidence in the costs achieved.

4.10 Asset management processes for non-network assets

Non-network assets are those not part of the network asset portfolio, which is directly utilised to deliver gas to our customers. These assets support the operation of our business and are critical for effective and efficient operation. Non-network assets include information systems and other non-network assets, such as motor vehicles, including our leak detection vehicle, equipment, and critical spare parts.

Asset information systems

The information systems (IS) at the core of our asset management relate primarily to information we use to plan, design, operate, monitor, and maintain the gas network and its performance. However, this also extends to our activities for Information Disclosure, regulatory and statutory reporting, customer management, and billing management. We list the IS we use further below in this section.

Easy access to accurate and useful information is essential for an effective gas utility. It is a valuable company asset that sits alongside our physical assets and demands the same level of protection and management throughout its lifecycle.

Asset management IS are predominantly software-based applications, ranging from extensive, integrated, enterprise-wide systems to standalone processes or spreadsheets. However, they also include paper-based and photographic records, maps, and drawings.

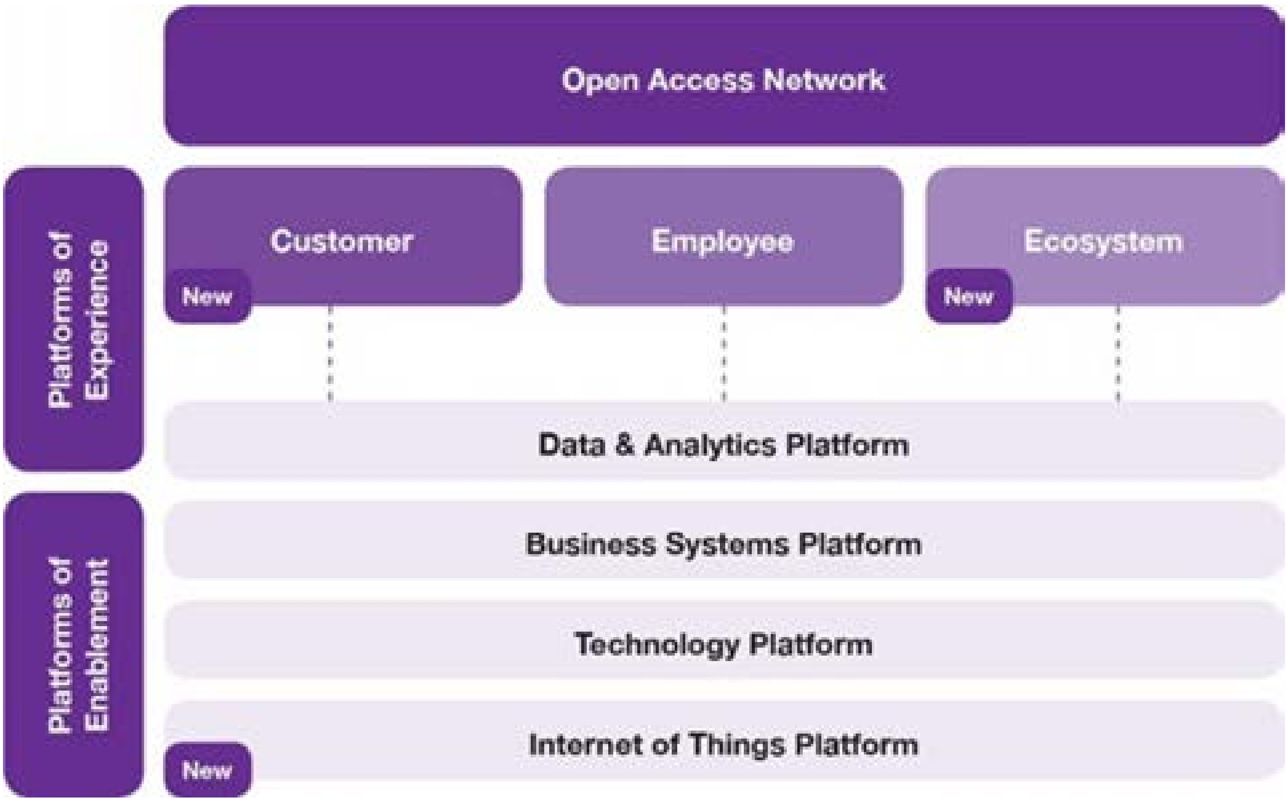
The ultimate objective of these systems is to enable us to provide comprehensive, easy-to-access asset information, and to ensure that this is accurate and consistent.

Information technology architecture

We have adopted a platform approach where all the information and technology capabilities required to support our business throughout this planning period are assembled into seven logical groups or platforms. This forms our future state architecture, as shown in Figure 4.15 and will see the addition of three new platforms: Customer Experience, Business Ecosystem, and Internet of Things.

It is important to note that we have not specified a separate cyber security platform as this is a component of each platform.

Figure 4.15: Technology infrastructure platform architecture (future state)



Information systems that fall within the future state architecture platform are described in more detail below.

Table 4.5: IS architecture

Team	Description	Key systems
Business Ecosystem platform	Supports the creation of, and connection to, external ecosystems, marketplaces, and communities. Cloud-based application programming interface (API) management, control and security are its main elements.	Dell Boomi, SAP PO/PI, Microsoft Azure API Gateway
Data & Analytics platform	Contains data management, business analytics and advanced analytics capabilities. Data management programs and analytical applications fuel data-driven decision-making, and algorithms automate discovery and action.	SAP Business Objects, Data Services, and Information Steward, Tableau Online, SQL Server Datawarehouse, Google Cloud Platform, Alation Data Catalogue
Business Systems platform	Supports the back office and operations, such as Enterprise Resource Planning (ERP) foundation using SAP (System Analysis Programme), Advanced Distribution Management System (ADMS) and information management.	SAP S/4 HANA, ESRI GIS, Clearion vegetation management, Junifer Billing, Customer Works management system, OSII SCADA & OMS, Safety Manager, AutoCAD, OSI PI
Technology Infrastructure platform	Traditional infrastructure and communications services (telephony, collaboration, corporate network).	Hytera DMR, Zetron Radio Console, Juniper WAN, Cisco LAN, Microsoft Hyper-V, Microsoft SCOM, CyberX, CrowdStrike
Internet of Things platform	Connects physical assets for monitoring, optimisation, control, and monetisation. Capabilities include connectivity, real-time data processing/analytics and integration to core and operational (OT) systems.	HiveMQ MQTT broker, OSI PI

Information security

Cyber risk management is a core component of our business. It is essential in the face of an ever-evolving threat landscape and an increasingly interconnected IT ecosystem. Our strategy for managing information (cyber) security risk is continuous improvement, simplifying our approach to risk quantification, and finding the right balance between security, maintainability, and agility.

Information security involves protecting our organisation’s information systems (including the data they contain) from unauthorised use that could jeopardise the confidentiality of our employees, customers, and partners, negatively impact the availability of our core operational systems, or corrupt the integrity of the data we need to deliver our services effectively.

A dedicated Information Security team, the Privacy Officer, and the broader Risk team manage our Information Security. Our works programme not only aims to manage those risks faced by our core energy distribution networks and customer-facing IT systems, but to ensure we remain resilient in the face of new and emerging threats.

Data privacy is essential. Using third-party software services to host and process sensitive data increases the risk of data compromise, breach of privacy laws, and reputational damage. In addition, legal and regulatory changes place more emphasis on the privacy and security of personal data. In addressing these concerns, we will maintain our ISO: 27001 certification for managing sensitive customer information and take a risk-based approach to strengthen our cyber security controls.

IT systems implementation and continuous improvement

Our strategy for ICT is to improve reliability, simplify operations, reduce costs, and enable business agility. We are doing this by reducing the number of configurations, customisations, products, and suppliers we support.

We have adopted a “cloud first” strategy for non-mission critical IS services. This means that all new applications will be either software as a service (SaaS) or cloud-hosted, and we will integrate solutions using integration platform as a service (iPaaS) and cloud-based application programming interface (API) management. Cloud services will help drive standardisation, reduce implementation time, and bring operational benefits important for a midsize organisation such as ours.

Asset information systems

We have several applications that make up our asset information and business systems platform used to manage asset data.

Enterprise Resource Planning (ERP) system

We have recently implemented a new ERP using System Analysis Programme (SAP). It provides a single, integrated software system that connects our financial and works management (projects, maintenance etc) systems, and is the master of non-spatial asset and financial data. SAP also provides financial tracking, works and maintenance programming, works and maintenance management, procurement, asset information database, asset condition database, and defect asset management.

Mobile workforce management

We have also integrated a mobile workforce management solution (Blueworx) to provide field staff real-time access to SAP. All these capabilities are interconnected, which lead to operational efficiency gains, the primary benefit of an ERP. This application enables field capture of asset condition, maintenance activity results and defects. Data entered in Blueworx and synchronised with SAP, allows us to generate key reports.
Blueworx helps ensure that service providers’ asset management data is complete and standard. This is key if we are to retain core asset knowledge in-house.

Geographical Information System (GIS)

We use a GIS to capture, store, manage and visualise our network assets. The system contains data about the mains and service pipes, regulator stations, line and service valves, special crossings, cathodic protection systems, and other installations of our gas distribution network. Importantly, it is also where we maintain information about the interconnectivity of our assets – essentially the master model of our network. It also distributes and informs other systems about our current assets.

Asset Investment Planning and Management (AIPM)

Our AIPM tool is a software package that allows us to optimise investment for our portfolios. Our electricity business uses Copperleaf’s C55 product (known internally as Copperleaf), to help with the portfolio optimisation process. Utility companies globally use Copperleaf to identify annual programmes of works, based on asset condition information. We are working towards testing the use of Copperleaf for the gas business by trialling its use to create our GWP for financial year 2024.

The aim of utilising Copperleaf is to use our understanding of our asset risk position to identify and validate investment solutions efficiently. In the future, this program can help us explore different scenarios to make optimal use of our resources.

SCADA Master stations, SCADA Corporate Viewer, and PI system

Our supervisory control and data acquisition (SCADA) system is only in place for data-acquisition, as it does not allow us to control the gas network remotely. Our system alerts duty engineers in real-time, allowing a fault person to be dispatched if required.
The Abbey Systems platform provides real-time access to users outside of our Network Operations Centre (NOC). This application provides real-time network information for planning and network management.

Outage Management System (OMS)

The OMS is a business-critical application designed for 24/7 operations within our business. The use of OMS encompasses the management of call operations and the coordination of outage restoration efforts. It enables the monitoring and recording of interruptions to customers, and provides relevant up-to-date information to customers through various channels, including retailers, our website, or an interactive voice recording system.

All gas fault reports from the retailer are directly emailed to the designated Customer Service email address. In addition, the retailer ensures an additional confirmation by contacting our Gas Emergency hotline to verify the receipt of the job. Within the dispatch team, a dedicated member is assigned to the gas shift duty. Their primary responsibility involves monitoring the Customer Service email inbox and promptly addressing incoming jobs. They ensure that these jobs are entered into the OMS via the call tree function. Subsequently, the team proceeds to communicate the job details verbally to the Gas Field Manager on duty for the respective region on the particular day. Following this communication, the job is assigned to the Gas Field Manager in OMS.

OMS is also used as the fault database to produce external reports for the Commerce Commission and Ministry of Business, Innovation and Employment, and internal reports for our management and engineers to improve network performance.

Customer Works Management System (CWMS) Gas

Our CWMS is an online workflow management system that facilitates/tracks the processes associated with connection applications, approvals, and works completion. Application, review, and input work steps are available to Powerco-approved contractors via the internet. The primary function of the system is to manage the flow of CIW requests through Powerco's formal process – from initial request through to establishment of the Installation Control Point (ICP) in billing and reference systems.

The workflow ensures efficient workflow and oversight, as well as ensuring the latest business rules are applied to all categories of connection work. Requests for new or existing customers to carry out work on our network is covered by our CIW process. This process places importance on providing new and existing customers a direct service from us, undertaken by our contractors at their connection point(s). The business rules of the process ensures that the capacity of the overall local network and the quality of supply to adjacent customers is retained.

Engineering Drawing Management System

The Engineering Drawing Management System is based on BlueCielo Meridian and works in conjunction with AutoCAD drawing software. It is a database of all engineering drawings, including gas main alignments, regulator stations, metering stations, special crossings, and standard drawings. In addition, the "Land Tenure" vault contains legal documents relating primarily to line routes over private property.

Salesforce

This is a workflow management system that maintains an auditable record of the lifecycle of a customer complaint. The application (Salesforce) is designed to work within the Utilities Disputes' rules regarding complaints, and automatically generates the key reports required. Another feature of the application is the integration with the GIS and ICP data sources to provide spatial representation and network connectivity details of complaints and power quality issues. This provides valuable information to the planning teams.

Safety Manager

Safety Manager is one of the systems that support our operational risk model and workflow. As the central repository for incidents, hazards and identified risks, it acts as a platform to manage these across internal and external stakeholders at an operational and strategic level. In addition, it assists the Health, Safety, Environment and Quality team in supporting the management of personal protective equipment (PPE) and health and safety competencies for all our employees.

Included within Safety Manager is the Gas Network Hazard Register, which identifies the hazards applicable to our employees, contractors, and the public. A copy of the register is available to our employees and contractors. The register is reviewed and updated on a regular basis, or as a result of an incident or investigation recommendations. Work is being undertaken to establish a link between Safety Manager and OMS, with the objective of enhancing the process of incident reporting.

Billing system

We receive consumption data from retailers and customers. Bills are calculated using the Junifer billing engine and invoiced from SAP.

Specialist tools and critical spares

Specialist tooling and associated equipment is required for the management of emergencies on the network. We also carry an inventory of critical spares that are essential for the resilient operation of the gas network. These are generally high-value assets that are not used frequently on the network but are required to complete reactive repairs and replacements of network assets. They are made available to our service providers and specialist contractors. Critical spares and equipment requirements are specified in the Gas Field Service Agreement (GFSA) service provider contracts and held in stores in Lower Hutt, New Plymouth, Palmerston North, and Napier. We retain the responsibility to maintain these assets.

Offices

Our long-term property plan is in place to ensure our offices:

- Are safe and secure for our employees, contractors, and visitors.
- Are functional and fit for purpose.
- Can support future staff growth.
- Support improved productivity and efficiency.
- Are cost-effective and efficient to operate.
- Are modern, resilient, professional, and comfortable.

We have four main regional offices throughout the North Island, with our gas business staff located in our Wellington and Palmerston North offices. Our offices are positioned to match our broad geographical coverage and ensure we are close to our assets and the work being undertaken across our network.

Our corporate office moved to Junction Street during FY23 in a move to consolidate New Plymouth offices and bring people together. Our four main regional offices and electricity depots are shown in Table 4.6.

Table 4.6: Main regional offices

Location	Ownership
Junction St office and depot (New Plymouth)	Owned
Grey St office (Wellington), Tauranga office, Te Aroha office, Whanganui office, Palmerston North office	Leased

Motor vehicles

There are 81 leased vehicles in the Powerco fleet. The fleet is made up of 60 allocated vehicles and 21 pool vehicles that support corporate functions. Of the 81 vehicles, 11 are dedicated gas vehicles, which includes the new Toyota Highlander recently purchased (leak detection vehicle).

Vehicle numbers have been relatively stable during the past 24 months, with only a small increase to support new roles. It is expected that vehicle numbers will decrease as the business looks at ways to rationalise and finetune the existing fleet. Vehicle consolidation and planned phase-out of the 2WD Ford Rangers to a more sustainable Toyota RAV4 Hybrid have had a positive impact on CO2 emissions and fuel consumption. This planned phase-out is part of the recent Powerco commitment to transition to a net-zero fleet by 2030. The vehicles have been selected based on several criteria, including safety, fit for purpose, and cost, and with input from our drivers and ELT. All vehicles are fitted with the EROAD GPS system to encourage and promote positive driver behaviour and help ensure compliance and effective vehicle utilisation.

Other non-network assets

Non-network assets cover expenditure categories that are aimed at improving support aspects of the gas business, such as asset information systems and supporting applications as described above. A large percentage of our effort in the business goes towards providing support to our network-focused activities, and improvements to these activities can result in significant efficiency gains.

The biggest efficiency gains that non-network systems support is our core asset management function and enabling us to make prudent investment decisions based on the following objectives:

- Providing a good understanding of our assets, their condition, location and technical attributes.
- Ensuring the right information is available to staff and contractors.
- Focusing on how we achieve our core function to deliver a safe, reliable, resilient, and cost-effective gas supply to our customers using quality asset information.
- Supporting the delivery of our Volume to Value Strategy investment tool that aims to balance cost, risk, and performance, to determine the best investment opportunity, while considering the remaining life of the asset and the optimum time to intervene.
- Using asset information to drive our vision to be a customer-focused infrastructure owner of choice by 2027.

4.11 Risk management and assurance

To meet our purpose of connecting communities, we must deliver value for our customers, communities, and partners. This requires us to take measured risks.

4.11.1 Risk management framework

Our risk management framework provides for prudent decision-making within our risk appetite boundaries. Our risk framework is a core component of our asset management practices. It is a living priority-based framework that is reviewed in conjunction with any material updates to our strategic objectives or operating environment.

The framework, aligned to AS/NZS ISO: 31000:2018 and with the principles of Ngã Tikanga – Our Way woven through our approach, provides guidance as we make risk-based decisions on asset health and criticality – both well-developed practice areas within our asset management system. Figure 4.16 shows our risk management framework guiding principles.

Figure 4.16: Risk management framework guiding principles

Guiding principles	
Proud to be here	A risk culture that promotes flexibility and accountability across the business, providing a safe environment and reliable service for our people, contractors, customers, and members of the public.
Better together	A priority-based approach enabling teams to work closely together in the pursuit of our priorities while ensuring the sustainable utilisation of resources.
Working smarter	A common understanding of where our risk systems support regulated and unregulated activity, and our approaches are effective and drive innovation.
Future focused	Our environmental, social, and corporate governance alignment drives sustainable choices that will help our communities now and into the future.

Risk process

Our risk system includes our governance, appetite and management processes. Our overall intentions and direction are outlined in Powerco's Risk Management Policy. This framework then provides the steps we need to follow to manage risk across Powerco.

Focused deep dive risk assessments, aligned to our risk appetite statement priorities, consider the following questions:

- Risk identification – are risks being identified from a range of sources that reflect the organisation's core activities?
- Controlled risk – what is the level of risk that the organisation is exposed to once the design and effective operation of processes and controls have been considered?
- Risk management plans – what further risk mitigations are required to reduce risk levels to within acceptable risk appetite boundaries?
- Future risk – what is the importance and effectiveness of risk mitigations? What is the remaining level of risk?
- Emerging risk – are there new or unforeseen risks that have not yet been contemplated?
- Risk monitoring – are risks being viewed dynamically to ensure timely risk-based decisions are being made?

Priority-based risk registers capture all risks that are relevant and are grouped around our four strategic themes:

- Deliver for our customers
- Get ready to do more for our customers
- Transform our customer experience
- Serve new customers.

All risks are ultimately measured as a function of the impact they have on achieving our business objectives and are evaluated on common environmental, social, governance, and operational assessment criteria.

Risk oversight

The Board, assisted by the Audit and Risk Committee, ensures the effectiveness of our risk management practices and empowers management to regularly identify, manage and escalate where appropriate the many sources of uncertainty facing our business.

The Board sets our risk appetite that supports all decisions required to achieve our corporate vision and objectives and is reviewed on an annual basis or when required following a major event. In practice, the risk appetite statements enable a common and agreed understanding of the risks that Powerco is willing to take.

The CEO and ELT are responsible for the monitoring and management of risk relating to our activities. This ranges from assisting the board in setting Powerco’s risk appetite to ensuring that employees and contractors understand how we manage risk. Each one of our priority-based risk registers is sponsored by a member, or members, of the ELT.

4.11.2 Risk monitoring and reporting

Ongoing review and monitoring are essential to the quality and effectiveness of our risk management processes. This allows us to integrate any feedback into possible revisions to the risk assessment and evaluation. If conditions have changed, it is important to establish a link to ensure the initial assessment and management decisions are revised if necessary. Our risk reporting structures are as follows:

- Group risk dashboard by strategic theme

Reporting through the monthly report for key business risks by priority area and risk appetite dashboard. Any significant changes will also be reported through the monthly report and may be out of cycle.

- Risk deep dive – Board Audit & Risk Committee (by presentation)

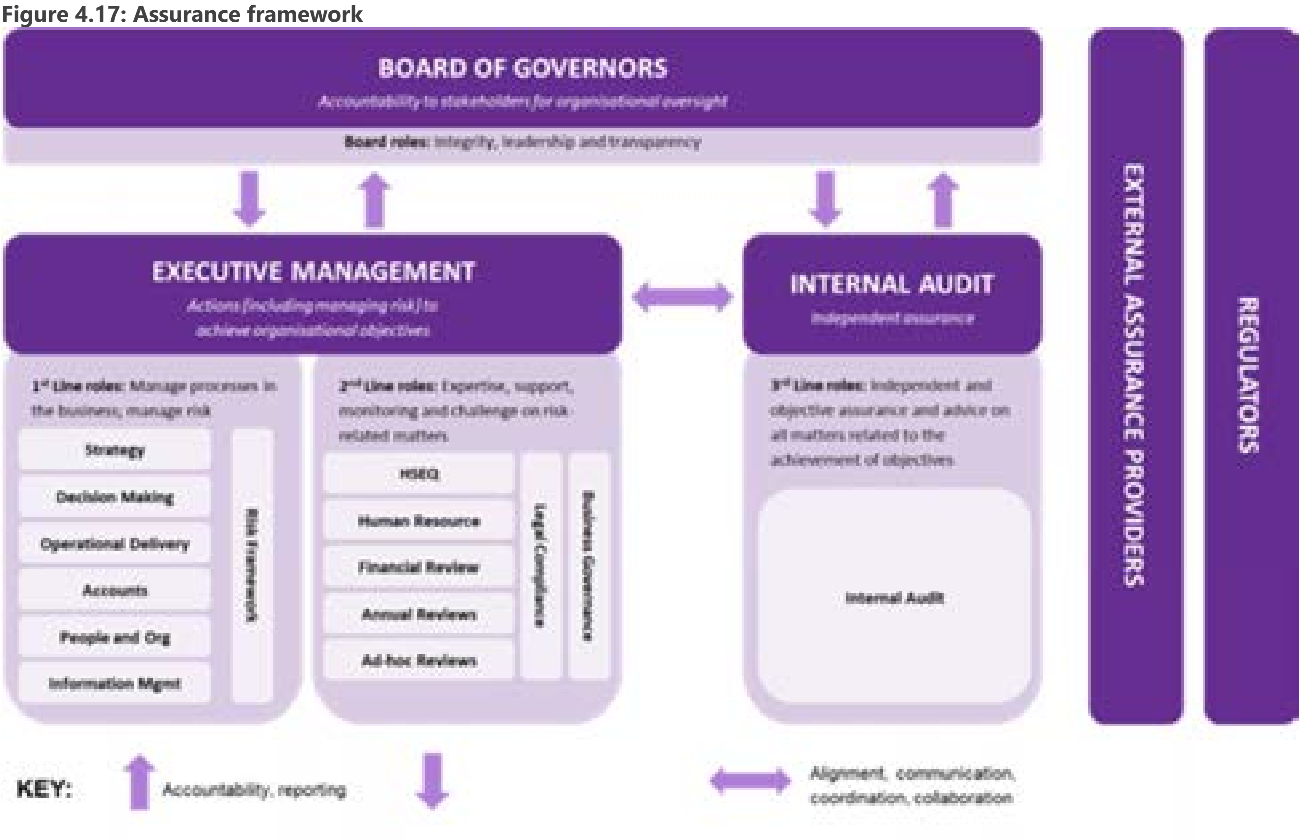
In depth review of key risks by priority area with specific focus on high-priority risks, current mitigation performance and future mitigation improvements.

Business assurance

Our Business Assurance Framework (BAF) sets out how risk and control assurances are obtained through the structured Three Lines framework. The BAF strengthens risk communication and assurance provision by clarifying essential roles and duties for various parts of governance, management, and day-to-day operations, and assessing the effectiveness of risk controls.

The outputs of the assurance activities inform the risk assessments for the business, and findings are reflected in our enterprise risk management system. The BAF outlines how assurance activities are structured at Powerco and how they interact across the three lines of defence.

Figure 4.17: Assurance framework



1st line of defence

This is the principal area where we focus our risk management efforts. A significant portion of business-as-usual practices, e.g., standard operating procedures, permit control, and confined space entry, reside in this layer. This layer includes line supervisors and frontline staff who conduct work on the network. A significant portion of the effort spent by the ELT, and senior management also forms part of this layer of defence.

2nd line of defence

This includes various compliance oversight functions. The objective of this line is to monitor key risk indicators and tell management where it should focus its efforts. Functions of this layer include:

- Multiple compliance oversight teams with responsibility for specific types of compliance monitoring, such as health and safety, environmental, regulatory, commercial, legal, and human resources.
- Risk management team that provides risk consulting and other business support services consistent with relevant ISO standards.
- Financial control functions that monitor financial risks and financial reporting issues.

3rd line of defence

Internal audit. This function consists of qualified internal auditing staff being supported by independent external assurance providers.

General network risks assessment

The detailed review of general network risks contributes to our gas formal safety assessment, safety management and public safety management system requirements under NZS7901, and our asset management practices. Specific focus of the most recent deep dive assessment was to review general network risks that have previously been assessed to have a controlled risk level of low or very low.

Grouped under the strategic theme of ‘Deliver for our customers‘, and the risk appetite statement priority to our goal of delivering a safe and reliable network of essential infrastructure to our communities, risks were assessed based on their likelihood and impact using the Gas ALARP risk assessment criteria.

Outcomes of the deep dive assessment were then grouped into the four categories of the enterprise risk framework – environmental, social, governance and operational, with a closer look at the key risks identified during the assessment. This included analysis of the mitigations currently in place, their importance in terms of essential or prudent status and the overall level of mitigation adequacy.

Figure 4.18: Extract – general network risks deep dive presentation

Gas Asset Risk Review

A closer look at the key risks

Risk Mitigation Key:
size
● Prudent risk mitigation
● Essential risk mitigation
colour
🟢 Mitigation is adequate/excellent
🔴 Mitigation is inadequate

Risks associated with pneumatic energy – Asset failure

Description:
The pressure within the network cause assets to fail and to act as projectile

Controlled Risk
🟨 Medium

Risks associated with hazardous materials – Asset is made of hazardous materials

Description:
The asset is made of hazardous material. Contractors can be exposed if they work on the asset

Controlled Risk
🟨 Medium

Detailed analysis of the outcomes of the general network risk assessment can be found in Appendix 4.

High-impact/low-probability events

Our networks are designed to be resilient to high-impact/low-probability (HILP) events, such as upstream supply failure, natural disasters, and critical equipment failures. The nature of our assets and the way we run our business limits the consequences should these events occur. These HILP events include:

- Loss of supply because of gas transmission pipeline failure.
- Undetected gas escape into a building leading to fire or explosion.
- Long-term loss of service because of a natural disaster (e.g. earthquake, volcanic activity or landslide).

In order to mitigate the impact of these events, we use the following controls:

- **Geographic diversity:** The geographical diversity of our networks increases the likelihood that natural disasters will affect only part of our networks.
- **Multiple supply points**: Our networks are designed with multiple supply points where practicable, to mitigate the impact of a supply point failure.
- **Standard equipment:** Our networks utilise standard equipment where possible. Consequently, assets can be relocated/rebuilt easily in the event of failure.
- **Earthquake resilient:** Our facilities have been upgraded to ensure resilience to earthquakes and to meet all related statutory requirements.

- **Scalable response:** Our scale and stable long-term capital programmes mean we can scale and redeploy resources quickly to attend to localised or regional natural disasters.
- **Response plans:** We have thoroughly tested emergency response plans and demonstrated capability to manage significant natural events and widespread damage to our networks.
- **Business continuity plans:** We have structured business continuity plans in place to ensure that the corporate aspects of our business are resilient and will support on-going operation of our networks.

Contingency planning

As part of our risk mitigation strategies, we have different contingency plans in place that are regularly tested by exercises. The main strategies relevant to the gas activities are the Gas Event Management Standard, the Emergency Response Plan, the Business Continuity Management Plan, the Civil Defence Liaison Standard, and the Pandemic Contingency/Major Unavailability of Staff Plan.

Gas Event Management Standard

This standard describes the mechanisms, roles, and responsibilities relative to fault and incident management. This includes reported smell of gas, customer supply interruption, or third-party damage on the network. It also prescribes the escalation criteria to trigger the Emergency Response Plan.

Emergency Response Plan

Our Emergency Response Plan is regularly reviewed and continues to develop to improve its performance in emergency situations. The plan is designed for emergencies, i.e. events that fall outside the ordinary operation of the network that routinely deals with incidents. The plan is supported by training, tests, equipment, and support structures to ensure that the proper response can be delivered.

Business Continuity Management Plan

Our Business Continuity Plan (BCP) is designed to manage and support several adverse scenarios. The BCP is supported by a Business Impact Analysis, which is conducted on a regular basis by business units to identify and prioritise critical infrastructure, assets, and processes for recovery action. The BCP is rehearsed by the appropriate teams on a regular basis, and our IT infrastructure has been designed with built-in resilience to ensure continuity of operations.

Civil Defence Liaison Standard

Our Civil Defence Liaison Standard sets out the interface required from the Gas Response/Incident Level team structure to the local Civil Defence Emergency Management Group in the event of a Civil Emergency being declared (from a Level 1 incident at a local level only, up to a Level 5 incident being a state of national emergency or emergency of national significance).

Pandemic Contingency Plan

Our Pandemic Contingency Plan contains guidelines and information that can be used should any event occur that results in the major unavailability of staff, including but not limited to pandemics. As an example, a major earthquake could result in a major unavailability of staff for a limited time while they deal with their personal situation.

4.12 Asset management performance measures

Performance targets

We have quality standards and additional targets that help drive performance improvements and measure our progress in delivering a safe, reliable, resilient, and cost-effective service for our customers and communities. Our key performance indicators (KPIs) are specific goals that align to our Asset Management Objectives, ensuring we operate to a standard that is appropriate in our industry and our environment, and reflect our commitment to further improving service levels to customers. Where practical, we compare our targets with other New Zealand distributors through publicly available information, or through our involvement with the Gas Association of New Zealand. All targets are set and committed to by the Gas Leadership Team and reported monthly to the Board.

Changes can be made at any time to any target if there are significant changes to decision-making factors, customer needs, the external operating environment, or internal drivers. The objectives associated with each measure over the AMP period are outlined in the summary of objectives and measures at the end of this section.

4.12.1 Keeping the public, our staff, and our contractors free from harm

We have four performance targets to measure 'Keeping the public, our staff, and our contractors free from harm'.

Powerco's gas assets transport a flammable gas and are integrated within its communities. Accordingly, Powerco is committed to preventing harm to the public, its staff, and contractors. We are committed to maintaining and improving the standard of safety management applied to our network.

Our commitment to public safety was demonstrated by certifying our Public Safety Management System (PSMS) in 2013. Our PSMS defines the specific steps we take to ensure our assets are designed to be safe and remain safe during operation.

Our safety targets focus on the following areas:

- Reducing the number of third-party damage (TPD) incidents year-by-year.
- Maintaining fast response time to emergency (RTE).
- Maintaining acceptable times to answer emergency phone calls.
- Reducing the number of staff and contractor lost time injuries (LTIs) per annum.

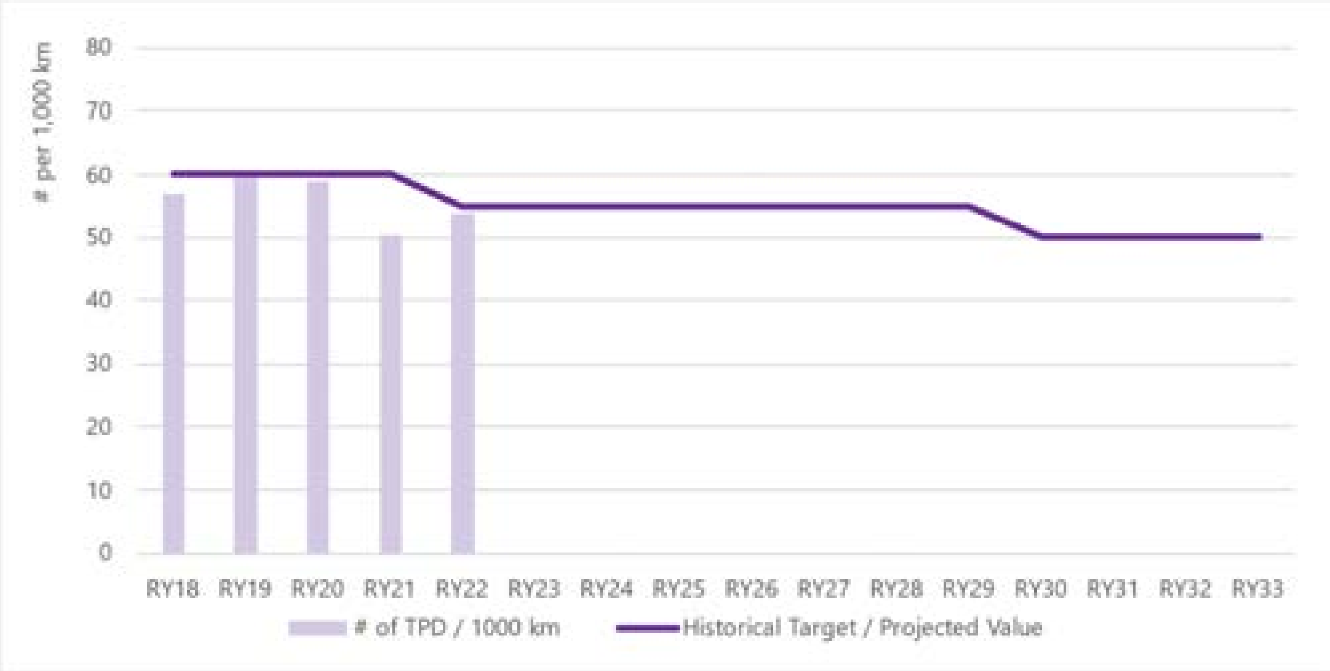
Third-party damage (TPD)

Target - Reduce TPDs to 50 per annum per 1,000km by 2033

TPD to our networks poses a significant threat to public safety and the reliability of our supply. Although most of the TPD incidents may seem minor, they can potentially cause substantial damage and injury. Therefore, tracking the frequency of TPD is crucial for assessing public safety and mitigating risks.

We have managed to reduce and maintain the rate of incidents on the network in the past five years despite the growing volume of traffic on our road corridors. This achievement is the result of our continuous efforts, emphasising the importance of education and support initiatives. As part of our risk management approach, we encourage contractors to adopt new technologies, such as hydro-vac excavation, relocating assets in high-risk areas and taking part in the 'Safe Digging Month' campaign, which takes place in November. Through these proactive measures, we anticipate a steady reduction in the level of TPD incidents, as shown in Figure 4.19.

Figure 4.19: Historical and projected TPD



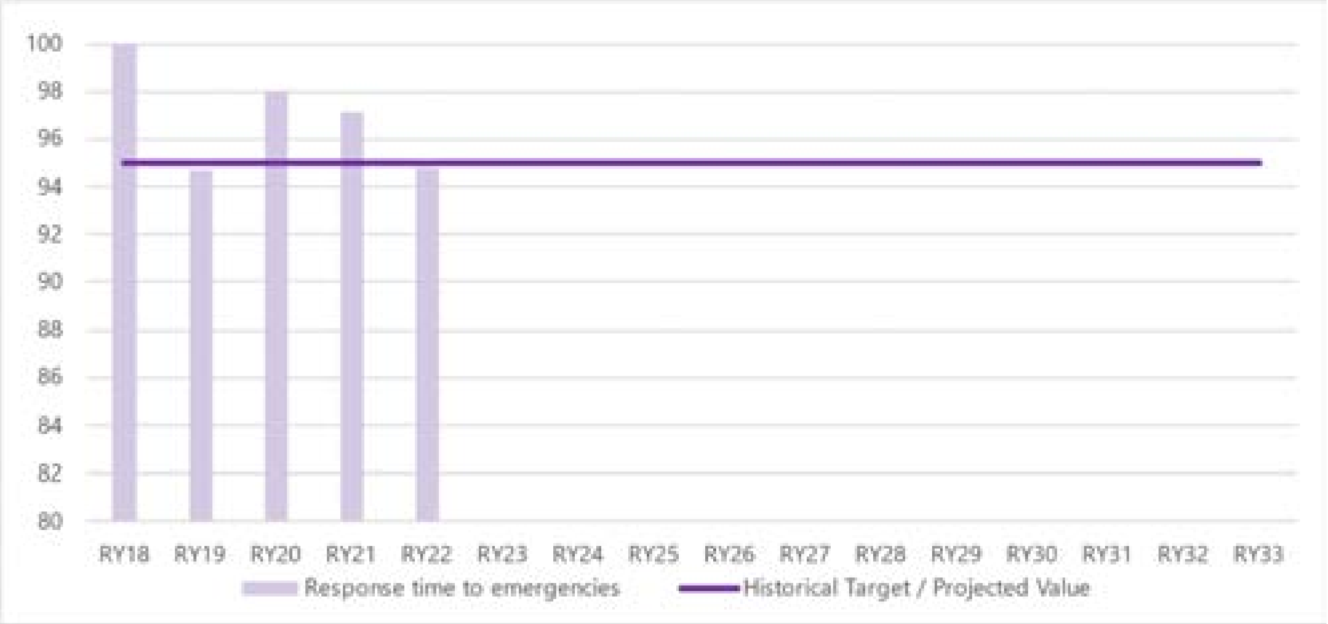
Response time to emergency (RTE)

Target – Maintain >95% RTE to within one hour

The RTE is a quality standard set out in the Commerce Commission's Default Quality Price-Path (DPP). It is a vital indicator of our effectiveness in managing incidents and minimising their potential impact. Our ability to promptly respond to emergencies relies on our system, which allows the public to report emergencies. Therefore, we establish specific targets and closely monitor the time it takes to receive these emergency calls as a key performance measurement.

In our DPP standard, we are required to respond to 80% of emergencies within 60 minutes, and 100% of emergencies within 180 minutes. We have set our internal target of responding to 95% of emergency events within one hour. This higher target ensures that we not only meet, but exceed, the requirements specified in the standard, as shown in Figure 4.20.

Figure 4.20: Historical and projected RTE

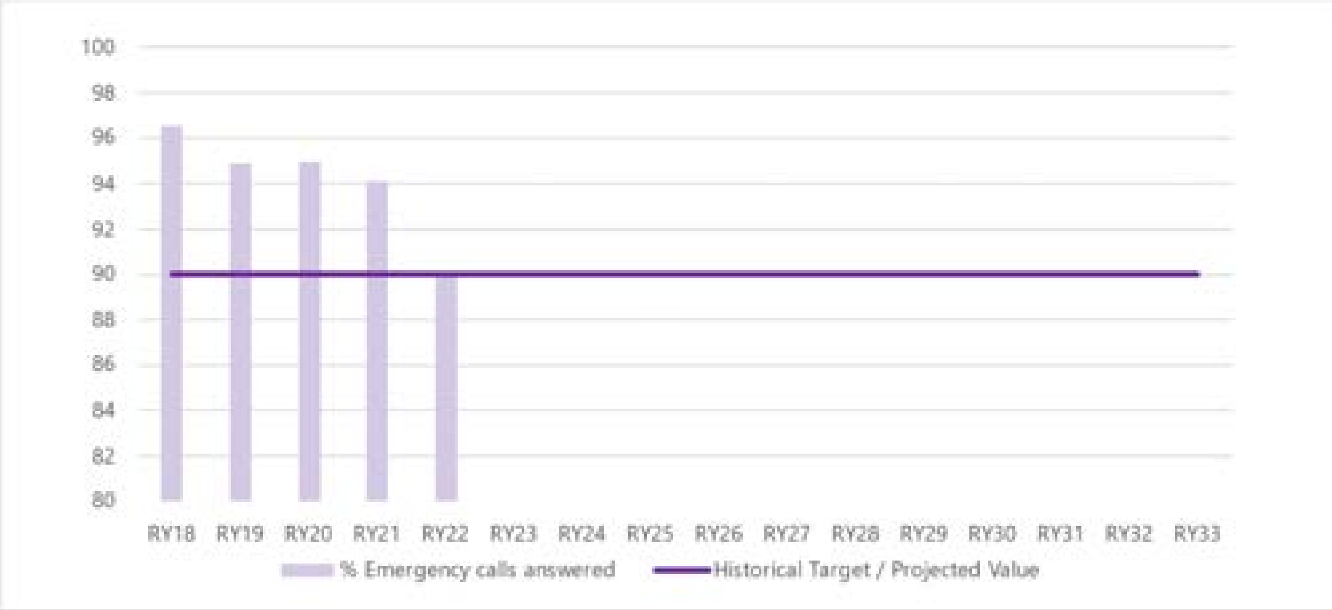


Emergency calls

Target – Achieve >90% of emergency calls answered within 30 seconds

Our Network Operations Centre (NOC) serves as the first point of contact for the public when reporting a gas-related incident. In order to ensure a prompt and efficient response to a potentially hazardous situation, we have set a time limit of 30 seconds for NOC to respond to incoming calls. This guarantees that the public receives timely assistance. As shown in Figure 4.21, we have been meeting our targets for emergency calls consistently.

Figure 4.21: Historical and projected emergency calls answered within 30 seconds



People safety

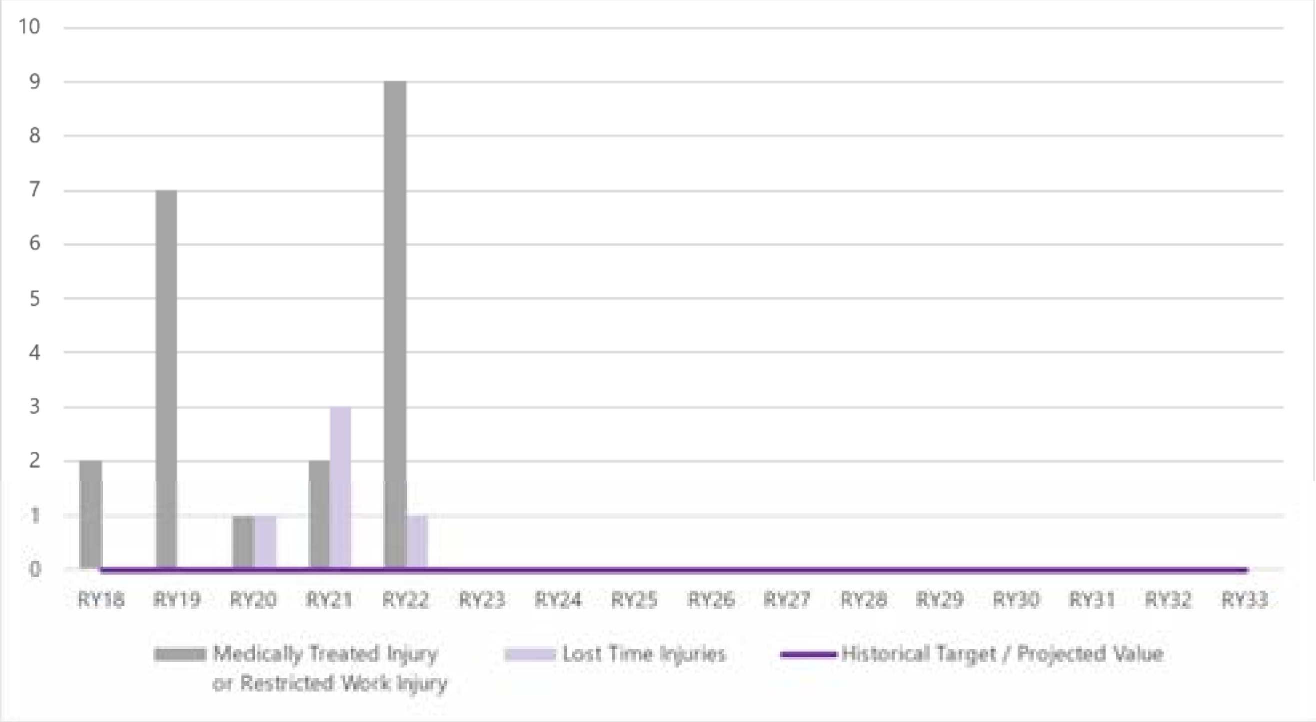
Target – Maintain zero staff and contractor LTIs per month

Along with our approach to public safety, we have the following goals to measure the outcome from all safety objectives:

- Zero fatalities or permanent injuries to staff or contractors. Worker safety throughout our networks, with a focus on events that could cause serious injuries from critical risks. We strongly believe that we must strive to prevent injuries to our workers, so any other target is unacceptable.
- Minimising injuries. The commitment by our staff and service providers to provide a safe workplace is demonstrated by a consistently low number of medical treatment injuries (MTI) and lost time injuries (LTI) rates across our business.
- Reducing public safety incidents, a focus on raising awareness, and communicating with customers, communities, and stakeholders.

Powerco continues to focus on critical control effectiveness, which we will partner with a continuous improvement approach to assessment of risk, as shown in Figure 4.22.

Figure 4.22: MTIs and LTIs



4.12.2 Continuously improve our customer service

During the past few years, we have leveraged the power of our Gas Hub to expand the range of communication channels available to our customers, the public, and stakeholders, making it easier for them to engage with us. This expansion includes the utilisation of social media platforms, instant chat features on our website, and more frequent interactions with our stakeholders. In order to gauge customer satisfaction, we annually carry out thorough and extensive market research surveys to gather valuable feedback. The insights obtained from these surveys play a significant role in shaping our asset management planning.

Two Asset Management Objectives have been set:

- Ensure new connection satisfaction is excellent by achieving a Net Promoter Score (NPS) of ≥50 by 2033.
- Ensure customer satisfaction is tolerable by having ≤30 customer complaints per annum.

Additionally, every second year we carry out specific market research on asset management. This research aims to assess the satisfaction of our customers regarding the quality of their gas supply and Powerco’s operational performance.

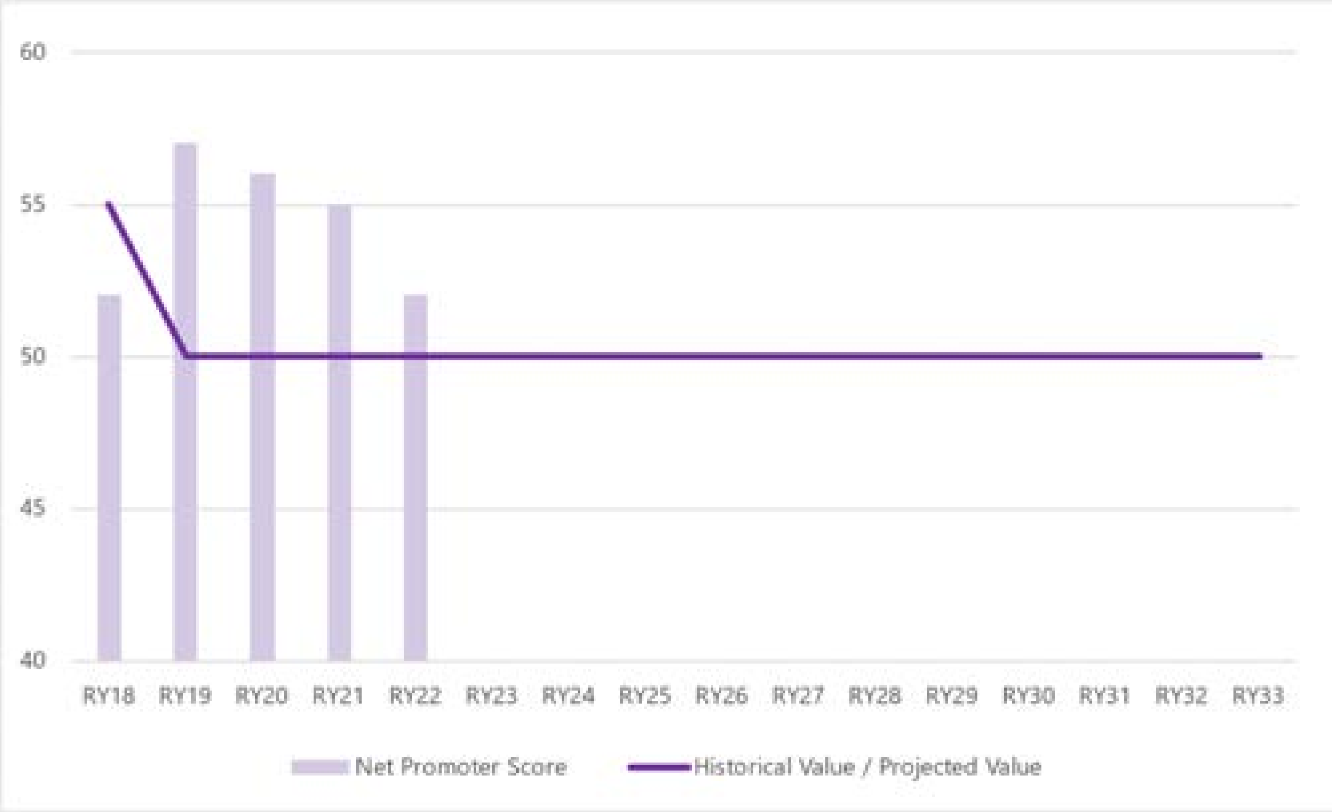
Net Promoter Score (NPS)

Target – Achieve an NPS of ≥50 by 2033

Powerco will continue to utilise the NPS survey system to help determine customer experience and customer satisfaction. The survey is largely based on the process for new customer connections. While this remains important feedback, capturing customer satisfaction feedback from long-term gas customers is becoming equally, if not more, important.

The drive towards net-zero 2050 is prompting customers to think about their future association with gas as an energy solution. In the near term, Powerco will continue to use the current NPS survey system but will be less focused on improving an already strong promoter target based on the new connection process. The new NPS targets, as shown in Figure 4.23, are a reflection of this. Over the coming years, customer feedback survey(s) will be adapted to inform Powerco about how it is performing in enabling a more sustainable future with gas (renewable, low carbon, affordable and effective).

Figure 4.23: Historical and projected NPS



Customer satisfaction

Target – Achieve ≤30 customer complaints per annum

To ensure we meet our customers' expectations for quality of service, Powerco measures the number of customer complaints per annum. As shown in Figure 4.24, the number of customer complaints is well within the targets set in the 2020 AMP. Powerco will continue to challenge performance in this area and has set new targets aimed at further improvement. To help with this, we have changed the approach to managing customer inquiries and workflow, and are planning to improve the current customer works management system (CWMS) during the next two years.

Figure 4.24: Historical and projected number of customer complaints

4.12.3 Continuously increase our asset management maturity

Asset Management Maturity Assessment Tool (AMMAT) score

Target – Achieve AMMAT score of 3.4 by 2033

The AMMAT[13] is a prescribed set of questions identified by the Commerce Commission for the self-assessment of gas distribution businesses' (GDBs) asset management performance and maturity. The Commerce Commission developed the tool to help all GDBs and stakeholders to assess and understand their performance and to encourage continuous improvement.

The purpose of the assessment is to evaluate our performance against the selected components of the PAS55 Standard. The self-assessment informs stakeholders about the level of competency we have achieved at the time of assessment.

The AMMAT tool has 31 questions, which are grouped into six key areas. The questions relate to the key components of the PAS55 framework for asset management. Note: the PAS55 Standard was superseded by ISO 55001:2014 in January 2015.

Improvements in our 2023 score as shown in Figure 4.25, is a result of the work we have done to align our gas AMS with the principles of internationally recognised asset management standard ISO: 55001. Our Electricity division's AMS was certified in 2022 to ISO: 550001 in recognition of its effective AMS. We have also made improvements to our programme planning and development processes that are outlined in Chapter 4.6. Further details about our asset management maturity can be found in Schedule 13.

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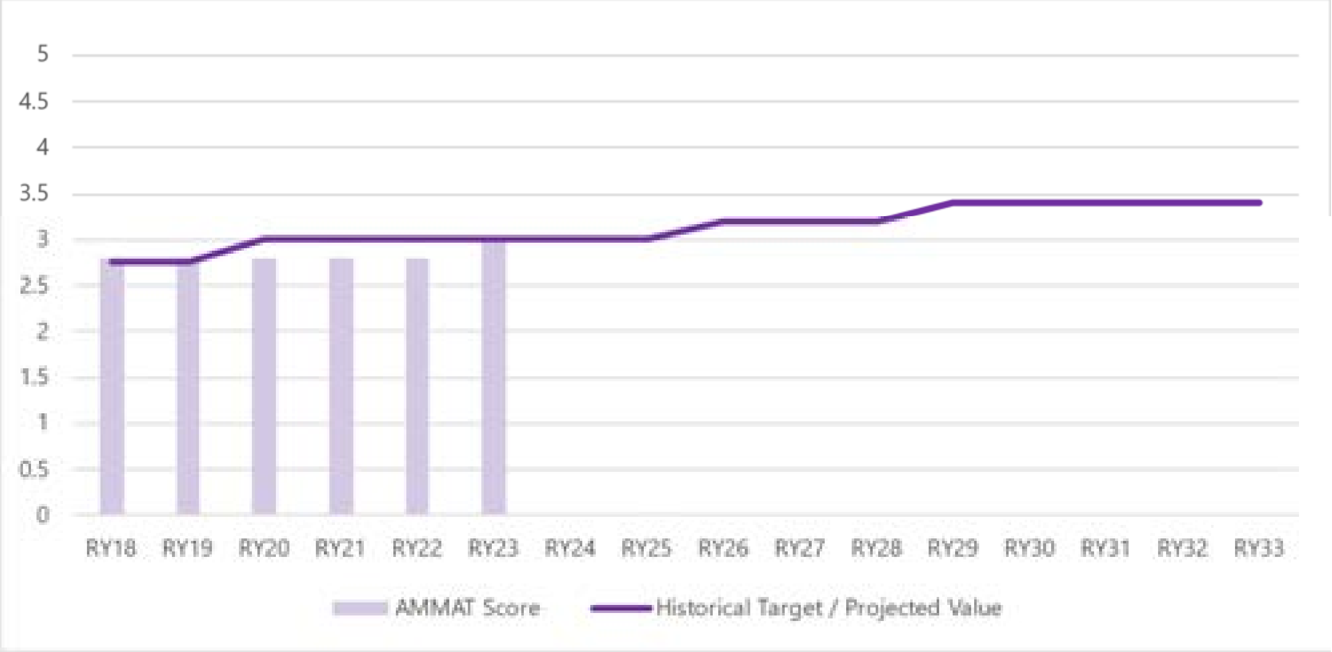
[13] As it is a regulatory requirement, our AMMAT assessment for the 2023 AMP is provided in Appendix 13

Figure 4.25: Historical and projected AMMAT score



4.12.4 Improve asset performance across all service levels year upon year

Asset performance improvement efforts involve optimising network capacity and improving network integrity and operational reliability.

The associated Asset Management Objectives are framed in terms of:

- Network capacity – poor pressure event reduction
- Network integrity – leak reduction
- Operational reliability – component failure resilience
- Operational reliability – gas quality assurance

Network capacity – poor pressure event reduction

Target – Achieve <10 poor pressure events per annum

The network must have sufficient capacity to meet anticipated demand and accommodate future growth, while also considering potential constraints on construction timelines. For instance, our new residential customers expect gas connections to be available within two weeks of their commitment. To consistently meet this timeframe, the network capacity needs to have additional capacity to accommodate the projected rates of connection.

To determine if the existing capacity is suitable for the customer demand, a reliable indicator is the pressure measured at representative points within the network. We continuously monitor the pressure and loads at specific locations on the network and regularly verify the capacity performance against criteria, to evaluate our performance in meeting this objective. If certain network systems are found to be approaching their capacity limits, we will develop a capacity management plan and implement it gradually. As a result, we expect a decrease in the number of customers experiencing low pressure events.

As evident in the Network Strategies and Development Plans section (Chapter 6) on the pressure droop strategy, significant progress has been made in enhancing the capacity of our constrained networks during the past decade. This progress is attributed to the implementation of our pressure monitoring programme and improved network modelling. Consequently, we have made the decision to lower our projected threshold for poor pressure events to six as shown in Figure 4.26.

Figure 4.26: Historical and projected poor pressure events

Network integrity – leak reduction

Target – Achieve <100 pipe leaks per 1,000km per annum

Maintaining the safe and reliable operation of our network, while minimising environmental harm, is crucial. Because of the hazardous nature of natural gas, a key aspect of achieving this is effective gas containment. Reliable containment is essential to maintaining uninterrupted gas delivery, as addressing gas leaks may require the shutdown of a section of the network. As part of our reliability objective, we aim to keep the number of uncontrolled gas releases to a minimum, taking practical measures to achieve this goal.

The term 'integrity' refers to the safe containment of gas and the reliable delivery of gas to our customers. This is expected by our customers and the wider public, and is a legislative requirement. The System Average Interruption Duration Index (SAIDI) is the commonly used industry metric for assessing the delivery reliability of electricity networks. However, measuring the reliability of gas networks presents challenges because they are underground. While gas networks offer inherent security, the restoration process in the event of outages can be significantly longer. This process involves carefully purging the network and recommissioning each customer, which can result in supply disruptions lasting several weeks. As a result, the SAIDI measure for gas networks exhibits high volatility from year to year, making short-term trend analysis difficult and potentially misleading. As a result, Powerco does not utilise SAIDI as a short-term measure but instead focuses on the long-term average to demonstrate overall reliability performance.

Several factors can contribute to uncontrolled gas release:

- Faulty components or installation.
- Gradual penetration of polyethylene (PE) pipe by rocks.
- Corrosion in steel pipelines and components.
- Operational errors during network maintenance.
- Incorrect pressure (resulting in pressure safety devices venting).
- Damage to pipeline by third parties.

To measure our performance in achieving this objective, it is essential to monitor the total number of gas release incidents occurring on our network. These incidents can be reported by the public or identified through our inspection procedures. However, it is important to note that gas releases resulting from third-party damage because of excavation and construction activities are not included in this measurement, as they are unrelated to the condition of the asset.

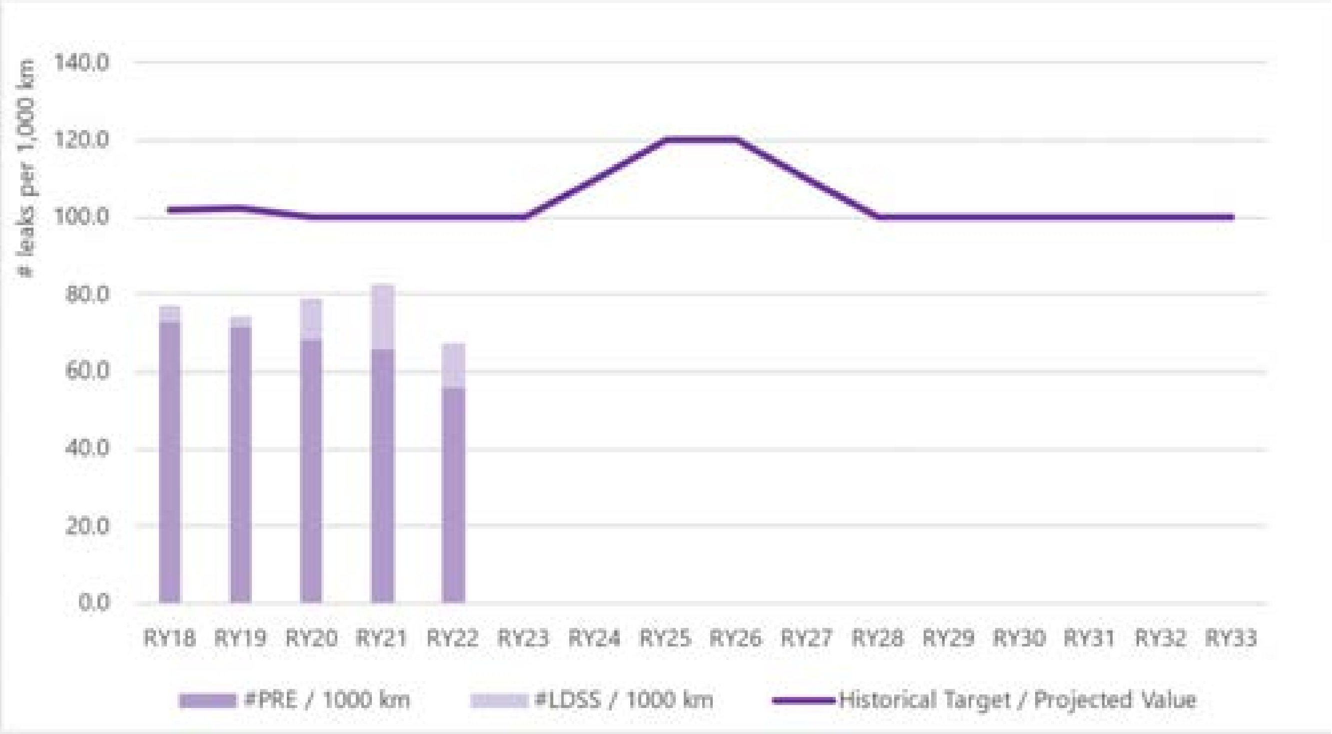
The frequency of public reported escapes (PRE) can fluctuate and is influenced by public perception. For instance, in the aftermath of an earthquake, we actively encourage the public to report any gas odours. Consequently, we may observe yearly variations in PRE that do not necessarily indicate a rapid deterioration of asset condition.

Leaks detected during scheduled survey (LDSS) results may vary, based on the extent of the leak survey conducted within a given year. We prioritise carrying out regular surveys of our intermediate pressure pipelines as they pose a higher safety risk when leaking. The measures PRE and LDSS are recorded individually, with PRE being logged in OMS and LDSS being logged in SAP. However, both leak targets are combined to effectively handle overall network leaks.

As part of our ongoing efforts to enhance asset management, work is under way with the delivery of our first leak detection vehicle. The adoption of this new technology will contribute to greater insights for our reporting system and a reduction in our overall leakage rates. Consequently, we expect a temporary increase in leak rates as we implement the leak detection vehicle over the next couple of years. However, our goal is to gradually decrease these rates and maintain consistently low leak rates well below our target.

We have consistently succeeded in keeping our leak rates below the maximum allowable level. This achievement is attributed to the successful implementation of the pre85 projects that we delivered in the past few years, as shown in Figure 4.27.

Figure 4.27: Historical and projected leaks



Operational reliability – component failure resilience

Target – Achieve <6 customers affected by supply interruptions due to component failure per annum

We aim to enhance the security of our gas supply by incorporating system redundancy in economically viable situations. The implementation of network loops is an example of this, ensuring a continuous supply to customers in the event of pipe damage. Because a simple measure of system redundancy, such as N-1, is not an accurate indicator of reliability, Powerco considers the network or subnetwork's characteristics, fault probability, and consequences when modelling reliability.

Figure 4.28 demonstrates the success of our commitment to reliability, with a minimal number of customers experiencing supply interruptions, and we expect the number of interruptions to remain consistently low.

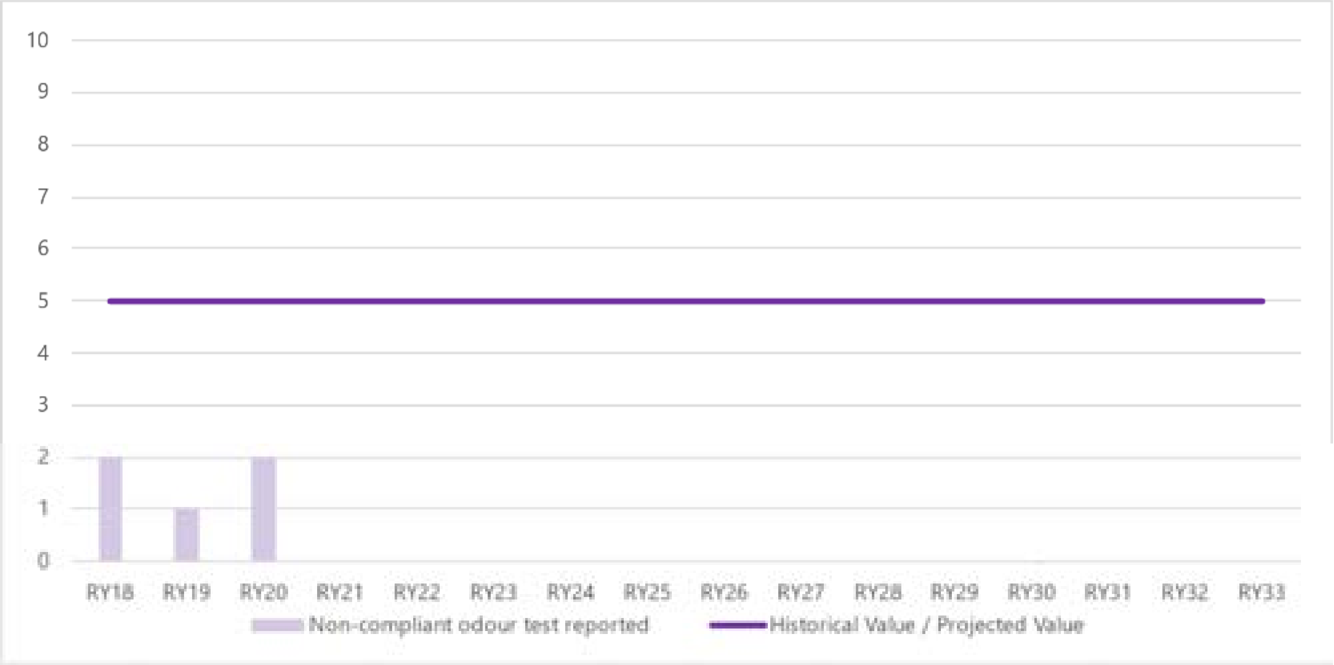
Figure 4.28: Historical and projected customer interruptions because of component failure

Operational reliability – gas quality assurance

Target – Achieve <5 non-compliant odour tests reported per annum

In New Zealand, all gas must meet the specification requirements and be odorised, as set out in NZS 5442:2008 and NZS 5263:2003 respectively. No single party has full responsibility for gas quality. Gas composition is controlled and monitored by the gas-processing facilities and transmission companies. Gas odorant is added by the transmission companies and monitored by them at gate stations. Gas network operators, such as Powerco, are responsible for ensuring that the quality of gas delivered to the network is maintained as it travels through the network, with no degradation because of contaminants such as water, dust or oil being added. We are responsible for monitoring gas odorant levels at representative points within the network and to report on non-compliant odour readings. Depending on the actual result of the test, we have an escalation process to communicate with the rest of the gas supply chain. The strengthening of our processes with the gas industry helped us to reduce the number of non-compliant readings and, in the past two years, no odour outside the specification has been reported, as shown in Figure 4.29.

Figure 4.29: Historical and projected non-compliant odour test reported



4.12.5 Continually improve our operational efficiency and effectiveness

Improved efficiency results in better utilisation of our resources through quicker and cheaper delivery of our work programmes. Improved effectiveness results in increased productivity, which will result in better value for money for customers.

The following two objectives have been set for our efficiency and effectiveness.

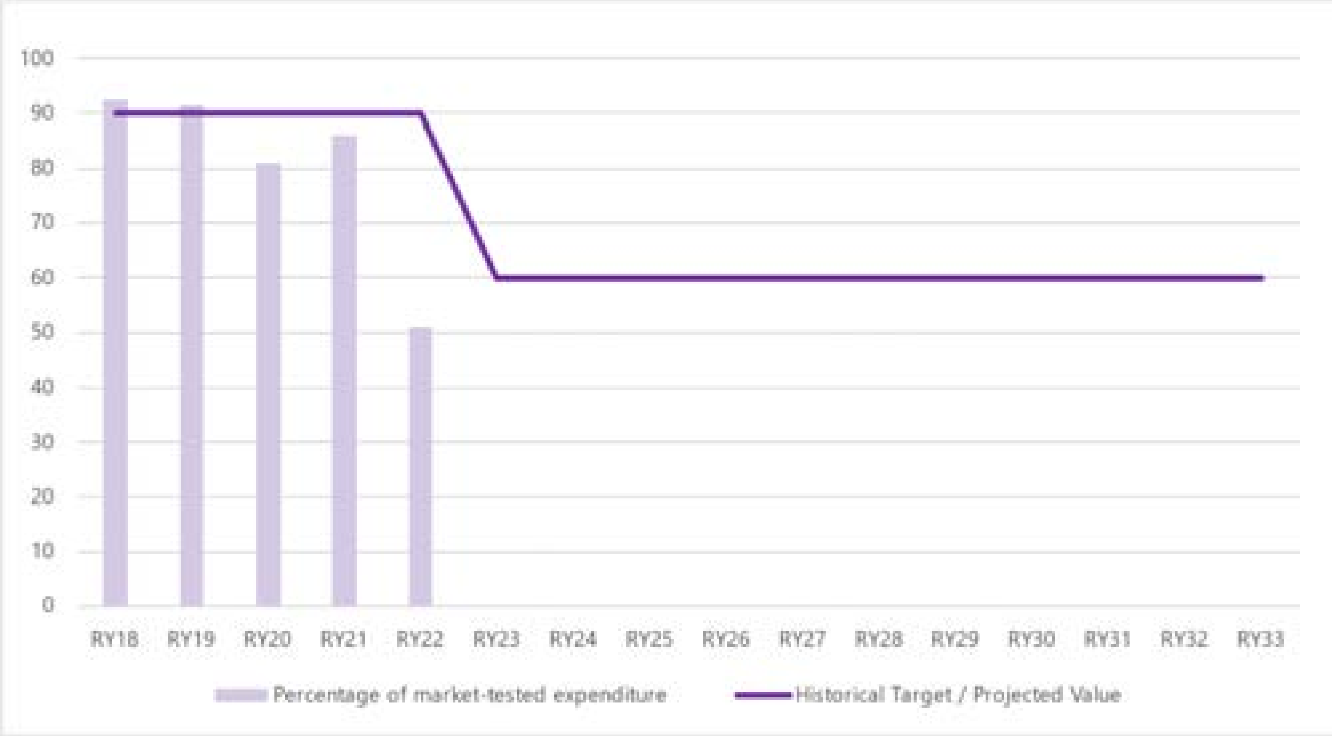
- Cost-effective provision of gas.
- Service provider (SP) key performance indicator (KPI) performance.

Cost-effective provision of gas

Target – Achieve >60% of expenditure benchmarked against market-tested pricing

The number of projects that are market-tested has dropped because of the higher quantity of projects that make up the GWP notional budget. With the new Volume to Value Strategy business objective, assets are refurbished to extend their lifespan, rather than replaced. Refurbishment projects are lower in cost and are naturally sole sourced to the incumbent contractor, as part of their respective Gas Field Service Agreements (GFSA). Arrangements remain in place to retain competitive price drivers through the contract price by means of prescribed competitive price adjustments. All other large projects over a certain value are open to contestable tender, ensuring costs are market-tested. This approach is illustrated in Figure 4.30.

Figure 4.30: Historical and projected percentage of market-tested expenditure



Service provider KPI performance

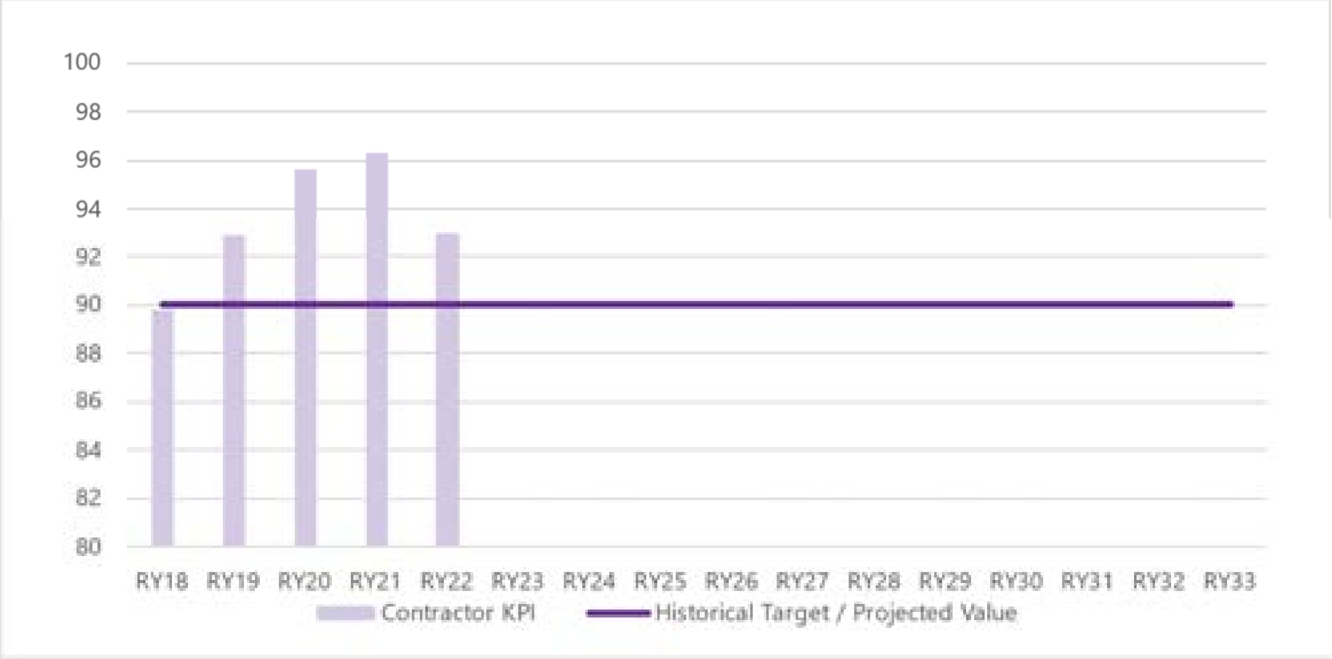
Target – SP performance against KPIs consistently exceeds minimum requirements

Our SPs deliver the physical works of our network operation. As such, they provide a significant component of the face-to-face interaction with the end users – our customers. We expect our SPs to maintain a strong work ethic, create safe work environments, maintain high-quality execution, and be continually improving. Powerco maintains KPIs to monitor the performance of our SPs against these factors.

This KPI system is an integral metric within the GFSA, implemented in 2018. These agreements expired in 2023 and have since been renewed, with considerations including current market conditions as well as the continued strong performance and improvement we see within our SP performance. This is reflected in our KPI data in Figure 4.31, as referenced against our benchmark for minimum performance. For commercial sensitivity reasons, values shown are the average KPI across our all our SPs over the entire regulatory year.

We maintain frequent face-to-face communication with our SPs to understand their concerns and issues, provide feedback on performance, and work together to continually improve the services provided. We believe our relationships are robust and we are confident this will continue with the renewal of our GFSA agreements.

Figure 4.31: Historical and projected percentage of service provider KPI performance



4.12.6 Summary of objectives and measures

Our KPIs are specific goals that align to our Asset Management Objectives. The Asset Management Objectives associated with each measure during the AMP period are summarised in this table.

ASSET MANAGEMENT OBJECTIVE	GOAL	MEASURE	RY18	RY19	RY20	RY21	RY22	RY23	RY24	RY25	RY26	RY27	RY28	RY29	RY30	RY31	RY32	RY33
Safety and Environment	Keep all network assets safe for the public by having TPDs decrease to 50 per annum by 2033.	Number of TPD incidents (#p.a./1,000km)	57	59.6	58.94	50.39	53.87	55	55	55	55	55	55	55	50	50	50	50
	Keep all network assets safe for the public by having >95% RTE within one hour.	Response time to emergencies (% within 1hr)	100	94.7	98.04	97.11	94.76	95	95	95	95	95	95	95	95	95	95	95
	Keep all network assets safe for the public by having >90% of emergency calls answered within 30 seconds.	Percentage of emergency calls answered (% within 30 secs)	96.5	94.9	95.01	94.12	90	90	90	90	90	90	90	90	90	90	90	90
	Maintain zero LTIs per annum to ensure our contractors and staff are safe.	LTI (#p.a.)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Customer and Community	Ensure New Connection Satisfaction is excellent by having the NPS ≥50 every year until 2033.	Net Promoter Score (-100 to 100)	52	57	56	55	52	50	50	50	50	50	50	50	50	50	50	50
	Ensure customer satisfaction is tolerable by having <50 customer complaints per annum until 2033.	Customer complaints (#p.a.)	38	34	32	30	13	45	40	30	30	30	30	30	30	30	30	30
Networks for Today and Tomorrow	Ensure we have adequate network capacity by having <10 poor pressure events per year until 2033.	Poor pressure events (#p.a.)	5	3	2	2	4	6	6	6	6	6	6	6	6	6	6	6
	Ensure network integrity is at an adequate level by having <100 pipe leaks (network and service) per year until 2033.	Number of network leaks (#)	76.9	74.3	79.1	82.44	67.08	100	110	120	120	110	100	100	100	100	100	100

ASSET MANAGEMENT OBJECTIVE	GOAL	MEASURE	RY18	RY19	RY20	RY21	RY22	RY23	RY24	RY25	RY26	RY27	RY28	RY29	RY30	RY31	RY32	RY33
	Ensure operational reliability by having the number of customers affected by supply interruptions due to component failure <6 per year until 2033.	Customers affected by supply interruptions due to component failure (#p.a./1,000 customers)	7.78	3.28	2.21	4.18	2.96	10	8	8	6	6	6	6	6	6	6	6
	Ensure gas is delivered reliably and at the right quality, by having non-compliant odour test reported <5 per year until 2033.	Non-compliant odour test reports (#p.a.)	2	1	2	0	0	5	5	5	5	5	5	5	5	5	5	5
Asset Stewardship	Achieve AMMAT score of 3.5 by 2033.	AMMAT score (# between 0-4)	2.8	2.8	2.8	2.8	2.8	3	3	3	3.2	3.2	3.2	3.4	3.4	3.4	3.4	3.4
Operational Excellence	Be a cost-effective provider of gas network services by having >60% of expenditure using market-tested pricing.	Percentage of expenditure using market-tested pricing (%)	92.4	91.6	81	86	90	60	60	60	60	60	60	60	60	60	60	60
	Improve SP performance continuously by ensuring SP performance KPIs continuously meet minimum requirements.	KPI values/performance (Score 0-100%)	89.8	92.9	95.6	96.3	93	90	90	90	90	90	90	90	90	90	90	90

4.13 Continuously improving our asset management practices

As part of our asset management improvements, we have the following initiatives under way:

- Introduced the use of SAP notifications to trigger the initial needs registration and prioritisation process. This feeds directly into our Te Puni Kāpuni (TPK) detailed planning giving effect to our 10-year investment plan, against our decision-making criteria for future delivery. This uses automation of existing systems to enable efficiencies in our planning process.
- Ongoing refinement of our Volume to Value Strategy investment tool that aims to balance cost, risk, and performance to determine the best investment opportunity, while considering the remaining life of the asset and the optimum time to intervene. Over the longer term, we will extend this investment tool to include all our mains and services and stations asset classes.
- Purchase of our first leak detection vehicle in preparation for undertaking our first round of gas leak detection. Using new equipment will provide more accurate data to determine specific emissions mitigation options with analysis using the MarcoGaz leakage model.
- Working towards testing the use of Copperleaf for the gas business by trialling its use to create our Gas Works Plan (GWP) for financial year 2024. The aim of utilising Copperleaf is to improve our understanding of our asset risk and validate investment solutions efficiently, creating a step change in our portfolio optimisation capabilities.
- A new controlled file management system, DocuHub, has been implemented where we maintain the most up-to-date versions of our policies, standards, delegated authorities, charters, and forms, including our asset management documentation. It demonstrates how Powerco understands and applies legislation, regulations, and other key asset management obligations across the business. Collectively, these documents outline our expectations of every employee and how we do things at Powerco as part of Ngā Tikanga – Our Way. All documents are assigned to an owner and DocuHub uses automated workflows to publish approved documents once executive sponsor approval has been given, as well as following up when approved documents are scheduled for review.
- An upgraded identification process for tagging of underground valves. This streamlined the administration and management cycle, adding value not just by removing non-productive time, but by increasing systems accuracy. It allows data captured through site validation to sync directly with GIS and SAP, providing up-to-date information to all users.

Planned emergency levels of service

As an owner and operator of gas network distribution assets, we have a responsibility under the Civil Defence Act (the 2002 Act) to ensure our emergency preparedness and response plans meet the obligations of the act from both a lifeline utility and climate-related resilience perspective.

The Government has introduced an Emergency Management Bill 225-1 (2023), Government Bill to replace the Civil Defence Emergency Management Act. This Bill builds on the 2002 Act and retains existing functions and powers for managing emergencies at local and regional levels.
Critical infrastructure entities (referred to as lifeline utilities in the 2002 Act) provide essential and enabling infrastructure that support commercial and domestic activity. The Bill, when enacted, will include the requirement for critical infrastructure entities to establish and publish a Planned Emergency Level of Service (PELOS), which is a new legal framework establishing Aotearoa New Zealand can prepare for, deal with, and recover from local, regional, and national emergencies. With these changes on the horizon, we are looking at how PELOS will be established and integrated as part of future gas emergency management and will be considered as part of our future Adaptation Resilience Plan.

Asset lifecycle management

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5. Asset lifecycle management

This chapter provides an overview of our asset classes and our asset management approach throughout the lifecycle stages. For each asset class, we discuss our current understanding of systemic issues, the condition of our assets, our approach to renewal programmes, operations, and maintenance, forecast expenditure, and information quality. Table 5.1 gives a broad overview of each asset class. The asset classes are outlined in detail further in the chapter.

Table 5.1: Asset class definition

Asset class	Definition
Main and service pipe (M&S)	**Main** – pipeline that transports gas from the bulk supply transmission system to each service main. **Service** – pipeline that transports gas from the main to the customer, ending at the meter control valve.
District regulator station (DRS)	An installation designed to reduce the pressure of gas.
Line and services valve (VAL)	A fitting installed in a pipeline designed to control the flow of gas.
Special crossing (SPX)	An installation designed to provide above or below ground passage for a pipeline across a river, road (national significance) or railway.
Monitoring and control system (MCS)	A monitoring and control system architecture that incorporates sensors, remote terminal units, networked data communications and computers for high-level process supervisory management.
Cathodic protection system (CPS)	A corrosion inhibiting system that ensures buried metallic pipelines are permanently cathodic, i.e. electrically negative to the surrounding soil.

In line with our Ngā Tikanga and Asset Management Objectives, our purpose is to deliver a better energy future to our customers by providing a consistently safe, reliable, resilient, and cost-effective gas network now and into the future. To achieve this, we work to manage our assets through their lifecycle stages in a manner that will deliver value to our customers.

Ngā Tikanga

- Future focused
- Proud to be here
- Better together
- Working smarter

Powerco's vision statement

By 2027 we are a customer focused infrastructure owner of choice.

Powerco's purpose statement

We connect communities

There are some common aspects to the lifecycle management of our asset classes – our approach to asset risk, asset condition, asset performance, asset information, asset costing, and our approach to defects and maintenance.

Asset risk

Our approach to managing asset risk involves conducting a comprehensive risk assessment over the entire lifecycle of the asset. This includes performing a Failure Mode and Effects Analysis (FMEA) assessment on each asset class. The outputs of these assessments are used to refine our Asset Class Strategies, which serve as the primary documents to guide our lifecycle activities while complying with our engineering standards.
FMEAs for each asset class will be reviewed during calendar year 23-24 in line with the Asset Class Strategies and plans.

For each asset class, criticality is assessed considering the severity and likelihood of the risk; and the methods used to detect and control the risk. The highest criticality risks identified in the FMEA assessments for each asset class is discussed in the subsections below. Appendix 4 covers general network risks.

Asset risk also influences our Operations and Maintenance programmes. A risk-based approach allows us to prioritise our maintenance activities based on the level of risk posed by each asset. This means we focus on assets that have a higher probability of failure and/or are critical to the safe and reliable operation of the network.

To ensure customer and community preferences are reflected in our approach, our maintenance activities are carried out by our in-house teams and contractors who are carefully selected based on their experience and expertise.

Asset condition

Asset age, number of defects identified per asset class, renewal models, number of leaks, and direct current voltage gradient (DCVG) surveys are factors we use to evaluate the condition of our assets and determine the appropriate maintenance and renewal. Powerco combines these to assess the condition grade in accordance with the system developed by the Commerce Commission. Table 5.2 shows how grades are applied.

By undertaking condition assessments on our assets regularly, we can make informed decisions about future investments and ensure that our Asset Management Plans are up-to-date and aligned with our objectives.

Table 5.2: Condition grading definition and application

Grade	Status	Definition
Grade 1	**Poor**	End of serviceable life, immediate intervention required. Intervention planned in next planning cycle or completed through reactive project.
Grade 2	**Fair**	Material deterioration but asset condition still within serviceable life parameters. Intervention likely to be required within three years.
Grade 3	**Good**	Normal deterioration requiring regular monitoring.

Grade	Status	Definition
Grade 4		Good or as new condition.
Grade unknown	-	Condition unknown or not yet assessed.

Asset performance

Asset performance is a crucial component of our reliability centred maintenance (RCM) and asset renewal planning. We utilise Table 5.3 to describe our standard performance assessment types and how they are applied to the respective asset classes.

Table 5.3: Performance measurements and assessment types

Assessment type	Description	M&S	DRS	VAL	SPC	MCS	CPS
Leakage surveys	Detection of leaks in the near vicinity to the asset.	X	X	X	X		
Material testing	Laboratory testing of material performance and failure.	X	X				
Safety assessments	Analysis of asset safety risks, including formal safety assessments.		X		X		
Condition assessments	Visual inspection of asset condition (defect detection).		X	X	X	X	
Monitoring alarms	Fault and warning alarms from monitoring systems.		X			X	X
Network monitoring	Analysis of network performance.		X			X	
Network modelling	Real-time network models and integration (SCADA, GIS, SAP).	X	X	X			

In our Asset Management System (AMS), we monitor asset performance through the identification of defects. The results of these assessments are analysed using asset performance models, which can then inform adjustments to our asset class strategies, maintenance programmes, and/or renewal projects. By continually monitoring asset performance and making necessary adjustments, we can ensure the safe and reliable distribution of gas to our customers while minimising risk and optimising asset utilisation.

Asset data and information

Information quality is key to enhance data-driven outcomes. Improving data quality is an important aspect of effective asset management. Having the right data enables better decision-making, risk management, and planning for maintenance and renewal activities.

Since the creation of the Projects and Process Performance team a year ago, the focus has been on gaining operational efficiencies by streamlining documentation requirements around fault responses and reactive repairs, and ensuring consistent information is captured throughout maintenance activities.

We now have the ability to report on data direct from our core Asset Management System (AMS), facilitating data- decision making using up-to-date data. These reports heavily influence the maturity of our condition assessment (summarised in Schedule 12a).

Furthermore, we are continuing to work on our AMS core asset information and dataset with initiatives such as our underground valve naming convention simplification, the underground valve identification programme, station component naming convention, and sectorisation mapping.

Asset cost

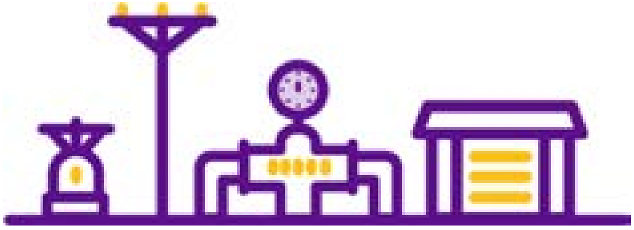
Our cost estimation process involves using historical data from completed projects, as well as input from our project engineers, contractors, and field staff, based on their experience. However, accurately estimating costs can be challenging, as most of our assets are located underground.

Unforeseen conditions, such as unknown third-party assets or challenging ground conditions, can impact on construction costs. Additionally, the location of the project can impact costing; for instance, works located in high-density community usage areas tend to be more expensive than works located in suburban or rural areas. Works within road corridors can be more costly because of the need for traffic management.

To mitigate risk and increase the accuracy of cost estimation, we split complex projects into multiple stages. This allows us to include a detailed design and costing phase, which improves the accuracy of the project cost estimate and reduces the risk of over/under spending our budget.

We have updated the process to allocate and prioritise investment across the Gas division. By capturing investment opportunities in a central register, these can be evaluated and ranked in line with our Volume to Value strategic direction, aiming to maximise the investment by executing the right activities at the right time.

Asset defects and maintenance



The maintenance approach for our classes is centred on condition monitoring undertaken during routine inspections. During these inspections each asset is checked against a performance criterion established by our engineering and operating standards. When the checks highlight findings outside the acceptable criteria, defects are raised as System Analysis Programme (SAP) notifications. These notifications are evaluated based on cost, complexity, and urgency.

Simple, quick-fix defects can be addressed instantly on-site by our service providers as they carry tools and consumables that allow them to complete basic repairs in a reactive way. This is considered unplanned maintenance. A post-repair notification is expected so an appropriate record of this activity can be created against the asset type performance history.

Large, complex defects are evaluated through our notification assessment and Te Puni Kāpuni - Issues Register (TPK) process. There are two possible planned corrective maintenance routes from the evaluation of cost, complexity, and urgency. The first is a Work Order for our maintenance team to execute the repair scope of works as part of their planned maintenance. The second is for our Service Delivery team to plan, scope and execute the scope of works as a project on our Gas Works Plan (GWP a 12-month view). From an investment perspective, both types of works are classified as either Capex or major Opex, depending on the specific nature of the work required.

5.1 Main and service pipes (M&S)

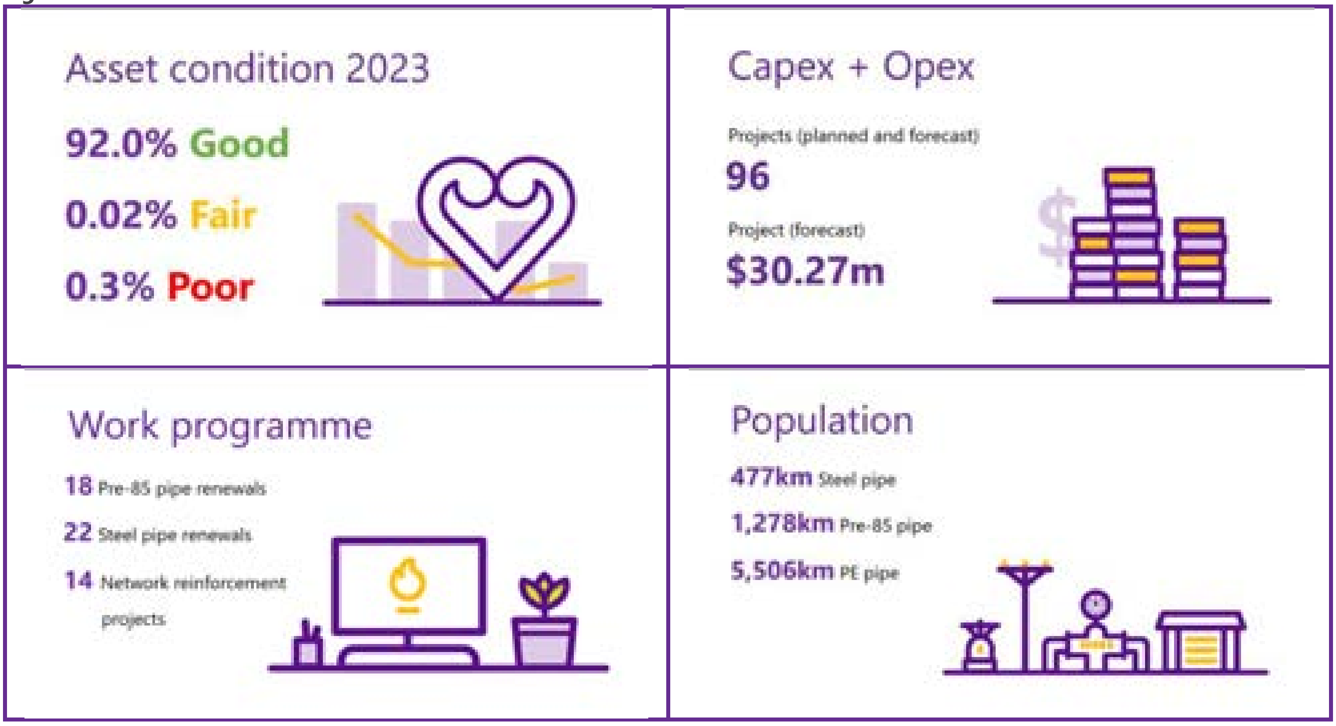
Main and service pipes (M&S) are the primary components of our distribution network, serving as the backbone of our infrastructure. This asset class is the largest in our portfolio, accounting for approximately 82% of our total Regulated Asset Base (RAB) value. Section 5.1.2 provides details on the types of pipes used on our network.

Asset class dashboard

Figure 5.1 corresponds to the M&S asset class dashboard, highlighting:

- Asset condition 2023 is reflective of Schedule 12a, and grading system categories defined in Table 5.2.
- $30.27 million of capital and operational investments spread across 96 planned and forecast activities.
- Operational investments are defined as being complex in nature, requiring detailed planning and project management oversight.
- The work programme that comprises 18 pre-1985 polyethylene (pre-85) renewal projects, 22 steel pipe renewal projects and 14 network reinforcement projects.
- Population of our assets is determined by the length of our M&S networks classified by material types.

Figure 5.1: M&S asset class dashboard



5.1.1 Asset class objectives

Contributing towards the delivery of a better energy future to our customers by providing a consistently safe, reliable, resilient, and cost-effective gas network now and into the future, the primary objectives for M&S pipes are:

- To convey gas across our networks, from the gate points to our customers.
- To efficiently reduce the total number of unplanned gas releases and outages resulting from asset failure.
- To reduce public safety risks.

To effectively minimise the overall risks associated with M&S, Powerco is committed to reducing the total number of leakage and unplanned outages resulting from asset failure.
Based on an analysis of historical events, the primary causes of risks are associated with third-party interference (TPI), non-standard construction/maintenance, and accelerated deterioration of pipeline assets (see section 5.1.3).

We also are in the process of addressing incorrect location information for pre-85 and unprotected steel pipelines.

5.1.2 Asset class overview

The classification by material type of the M&S pipes Powerco operates is showed in Table 5.4. It contains length by material type, service status, and the average age of the assets.

Table 5.4: Total number by material type, length and age

	Sub material	Total (km)	In service (km)	Average age (years)[14]
Cast iron	All	153	0	40
PE	All	5,933	5,678	30
	PE80 – Post-85	4,295	4,154	23
	PE80 – Pre-85	1,629	1,515	38
	PE100	8	8	5
Steel	All	882	457	40
	Yellow/grey jacket	287	256	42
	Galvanised	10	2	35
	Other[15]	584	202	21
Copper	All	1	1	10
Asbestos	All	13	0	0
Unknown[16]	All	157	89	39
Total	**All**	**7,139**	**6,225**	**34**

The characteristics of our M&S pipes are a product of the companies and network acquisitions Powerco has made over time – a key part of Powerco's growth history. The result is an amalgamation of different networks with their own design and construction philosophies, which is reflected in the different materials and pressure systems within our networks.

Our M&S networks are operated under different pressure envelopes as represented below:

Powerco's classification	**LP** (Tag colour green)		**MP** (Tag colour red)			**IP** (Tag colour blue)	
	LP Low Pressure	**HLP** High Low Pressure	**LMP** Low Medium Pressure	**IMP** Intermediate Medium Pressure	**HMP** High Medium Pressure	**LIP** Low Intermediate Pressure	**HIP** High Intermediate Pressure
---------------	7kPa	25kPa	210kPa	420kPa	700kPa	1,200kPa	
Industry classification	**LP** Low Pressure	**MP** Medium Pressure				**IP** Intermediate Pressure	

Powerco's network grew significantly between 1980 and 1997, adding what is now approximately 67% of our total network length. This can be observed in Figure 5.2.

The most common failures in our M&S networks are on PE pipes installed prior to 1985 (pre-85 PE) and unprotected steel sections. These material types are a particular focus for our repair and renewal programmes. For effective management of the pre-85 PE and unprotected steel pipe, we report quantity by type and age per region. Section 5.1.3 describes in more detail the type issues for this asset type.

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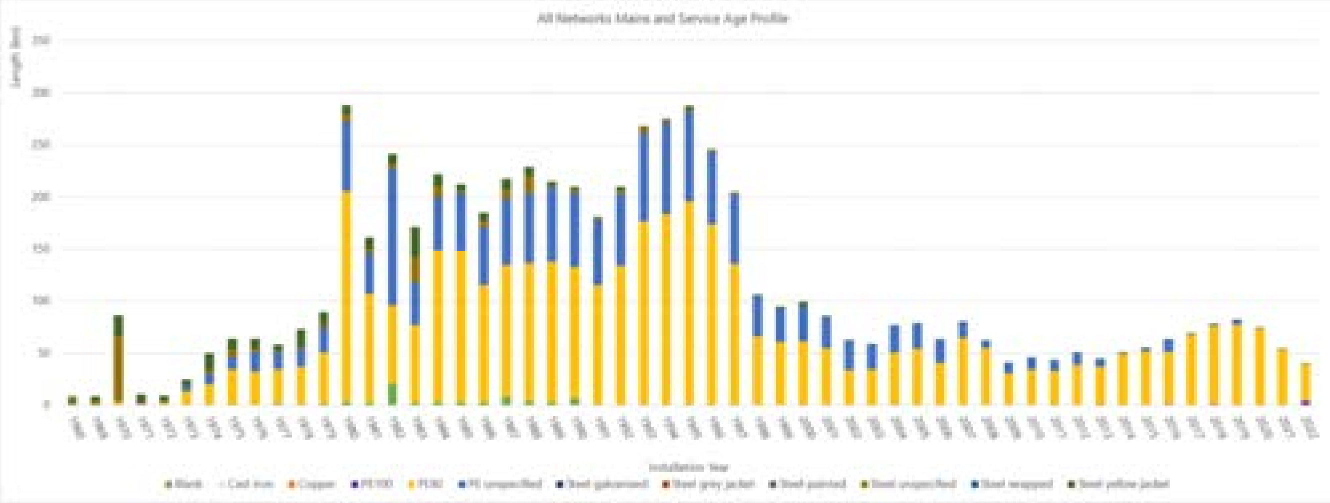
[14] In-service pipes only.

[15] Includes painted, wrapped and unknown.

[16] We assume this is made up primarily of PE and steel.

Figure 5.2: M&S pipes age profile for all regions



5.1.2.1 Wellington

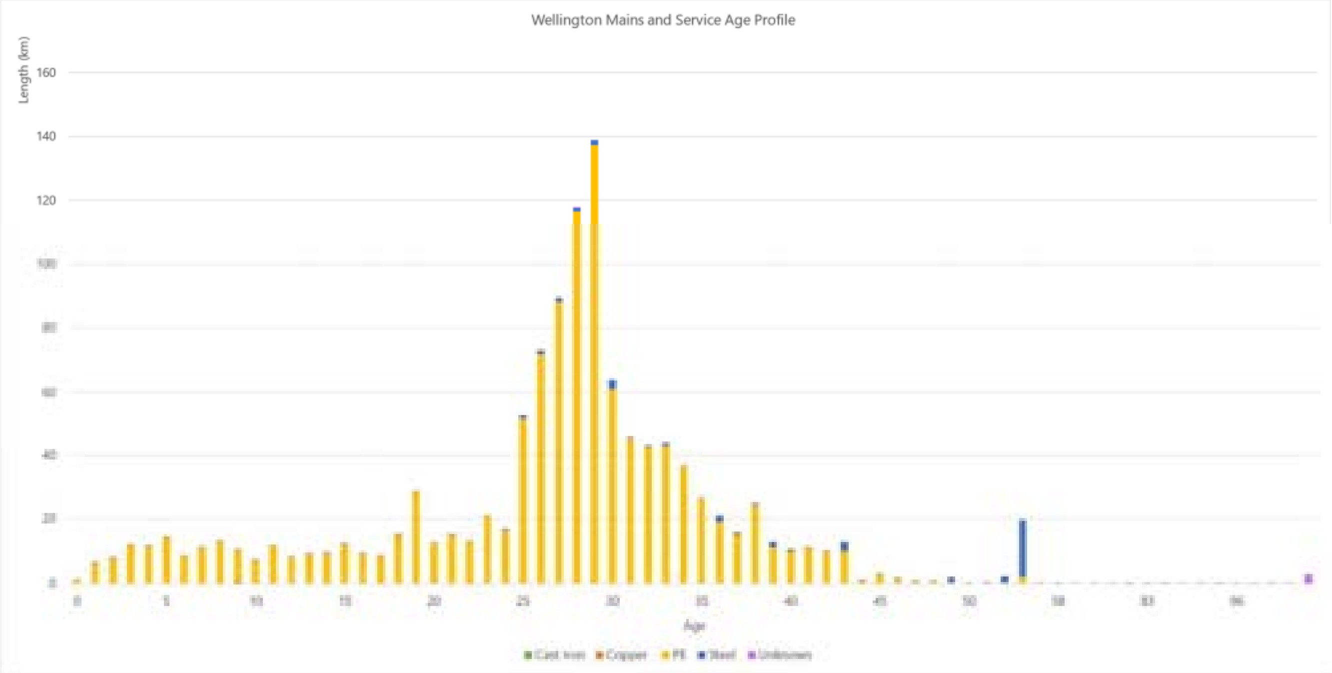
In the Wellington subnetwork, the predominant material used for pipes is polyethylene (PE). Over time, the cast iron pipes in the central business district have been gradually replaced with modern PE pipes. This replacement process began after 1985, resulting in a relatively low amount of pre-85 pipes (approximately 7%) compared with other regions.

The Wellington intermediate pressure (IP) line is constructed with steel pipes and protected by an impressed current cathodic protection system. Since 2020, the system has had a reconfiguration and renewal to ensure its continued effectiveness. When considering the age profile of the subnetwork, it is evident that the IP line was initially installed approximately 40 years ago, indicating its early construction compared with other parts of the network.

Table 5.5: Asset quantities and average age in Wellington region

Material	Sub material	Total (km)	In service (km)	Average age (years)
Cast iron	All	67	0	42
PE	All	1,162	1,128	27
	PE80 – Post-85	1,055	1,029	28
	PE80 – Pre-85	107	99	41
	PE100	0	0	9
Steel	All	303	43	30
	Yellow/grey jacket	13	11	26
	Galvanised	0	0	12
	Other	290	31	19
Unknown	All	15	4	48
Copper	All	1	1	9
Total	**All**	**1,548**	**1,176**	**33**

Figure 5.3: M&S pipes age profile for Wellington region



5.1.2.2 Hutt Valley and Porirua (HVP)

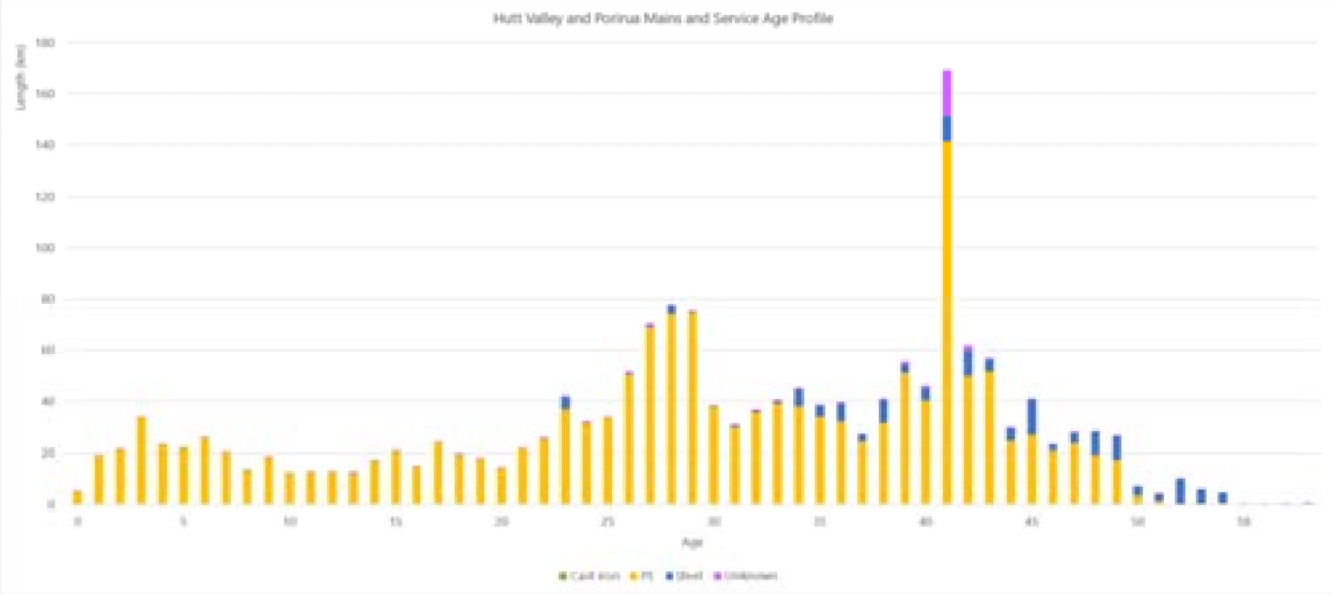
The Hutt Valley and Porirua (HVP) region predominantly consists of PE pipes, accounting for 89% of the total length of the area network. The HVP network has the highest volume of pre-85 pipes, 30% of all PE. HVP is also one of our networks with the poorest performance in terms of leakage.

The remaining portion of the network is composed of steel pipes, which are protected by impressed current cathodic protection systems. The Porirua cathodic protection system (CPS) upgrade has now been physically completed and we are in the process of updating SAP and GIS to reflect this work. Refer to section 5.6. of this AMP for further detail on the CPS upgrade programme.

Table 5.6: Asset quantities and average age in Hutt Valley and Porirua region

Material	Sub material	Total (km)	In service (km)	Average age (years)
Cast iron	All	8	0	41
PE	All	1,634	1,565	31
	PE80 – Post-85	1,057	1,031	26
	PE80 – Pre-85	576	533	43
	PE100	2	2	4
Steel	All	173	145	39
	Yellow/grey jacket	154	139	42
	Galvanised	3	0	36
	Other	15	6	21
Unknown	All	46	37	37
Total	**All**	**1,861**	**1,747**	**33**

Figure 5.4: M&S pipes age profile for Hutt Valley and Porirua region



5.1.2.3 Taranaki

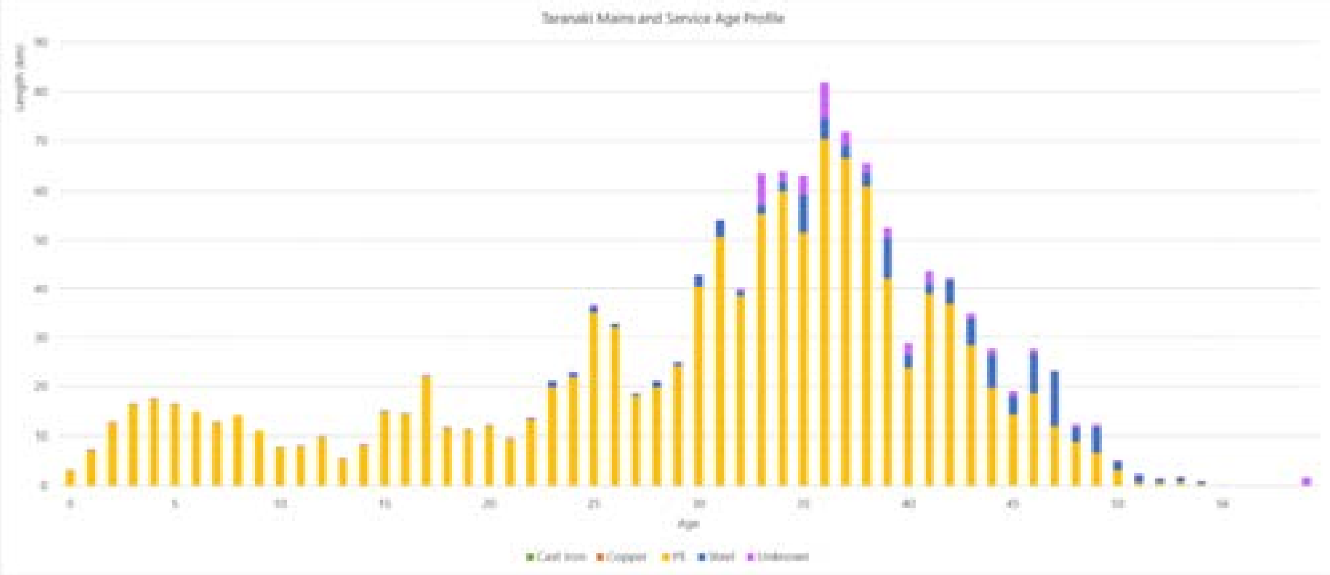
Most of the network in the Taranaki region is comprised of PE pipes, with 26% consisting of pre-85 pipes.

There are also pockets within the region where galvanically protected mild steel (medium pressure) pipes exist. The condition of the protection system for these pipes is unknown. The CPS upgrade programme targets the Taranaki subnetworks of New Plymouth and Hāwera for FY23-24 execution, bringing integrity and reliability of these steel pipes.

Table 5.7: Asset quantities and average age in Taranaki region

Material	Sub material	Total (km)	In service (km)	Average age (years)
Cast iron	All	33	0	40
PE	All	1,253	1,194	32
	PE80 – Post-85	847	820	28
	PE80 – Pre-85	406	374	41
	PE100	0	0	0
Steel	All	166	100	43
	Yellow/grey jacket	86	71	43
	Galvanised	6	0	42
	Other	75	29	21
Unknown	All	87	45	39
Total	**All**	**1,539**	**1,339**	**35**

Figure 5.5: M&S pipes age profile for Taranaki region



5.1.2.4 Manawatū and Horowhenua

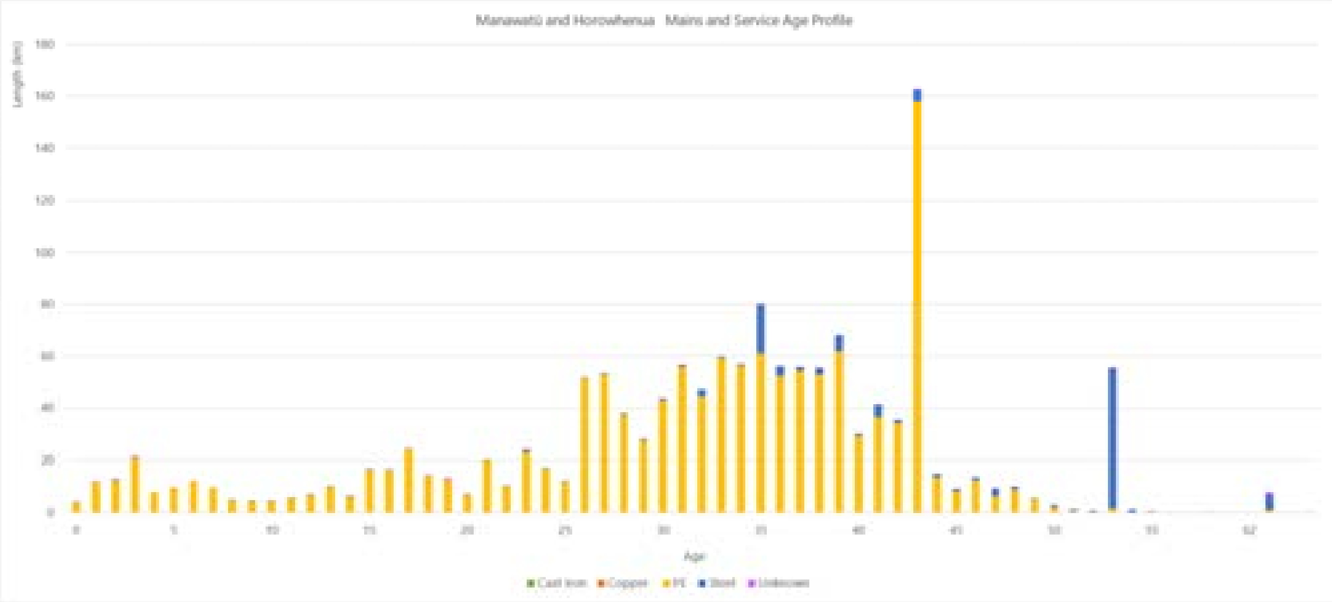
This network was mainly built using PE pipes, of which 32% is pre-85. Additionally, there are pockets within the network that consist of galvanically protected mild steel (medium pressure) pipes. The condition of the CPS for these steel pipes is unknown.

It is important to note that there is uncertainty in the pipe data quality for this region. This is indicated by two significant spikes in the installation dates recorded for the pipes. It is likely that these spikes represent instances where work was completed over multiple years but recorded as a single point in time.

Table 5.8: Asset quantities and average age in Manawatū and Horowhenua region

Material	Sub material	Total (km)	In service (km)	Average age (years)
Cast iron	All	28	0	42
PE	All	1,402	1,329	33
	PE80 – Post-85	901	857	28
	PE80 – Pre-85	500	471	41
	PE100	1	1	7
Steel	All	165	122	46
	Yellow/grey jacket	13	12	40
	Galvanised	1	1	43
	Other	151	110	25
Unknown	All	9	4	50
Asbestos	All	11	0	0
Total	**All**	**1,615**	**1,455**	**37**

Figure 5.6: M&S pipes age profile for Manawatū and Horowhenua region



5.1.2.5 Hawke's Bay

Hawke's Bay is Powerco's most recent network, characterised by pipe assets that are generally less than 35 years old. In Figure 5.7, a prominent spike indicates when a steel IP main was installed between Hastings and Napier. At more than 450km long, most of the network is PE and only 4.5% is pre-85.

Table 5.9: Asset quantities[17] and average age in Hawke's Bay

Material	Sub material	Total (km)	In service (km)	Average age (years)
Cast iron	All	17	0	31
PE	All	481	462	24
	PE80 – Post-85	434	417	26
	PE80 – Pre-85	41	38	39
	PE100	6	6	3
Steel	All	75	46	32
	Yellow/grey jacket	22	21	22
	Galvanised	0	0	10
	Other	53	26	18
Unknown	All	1	0	51
Asbestos	All	2	0	0
Total	**All**	**576**	**508**	**30**

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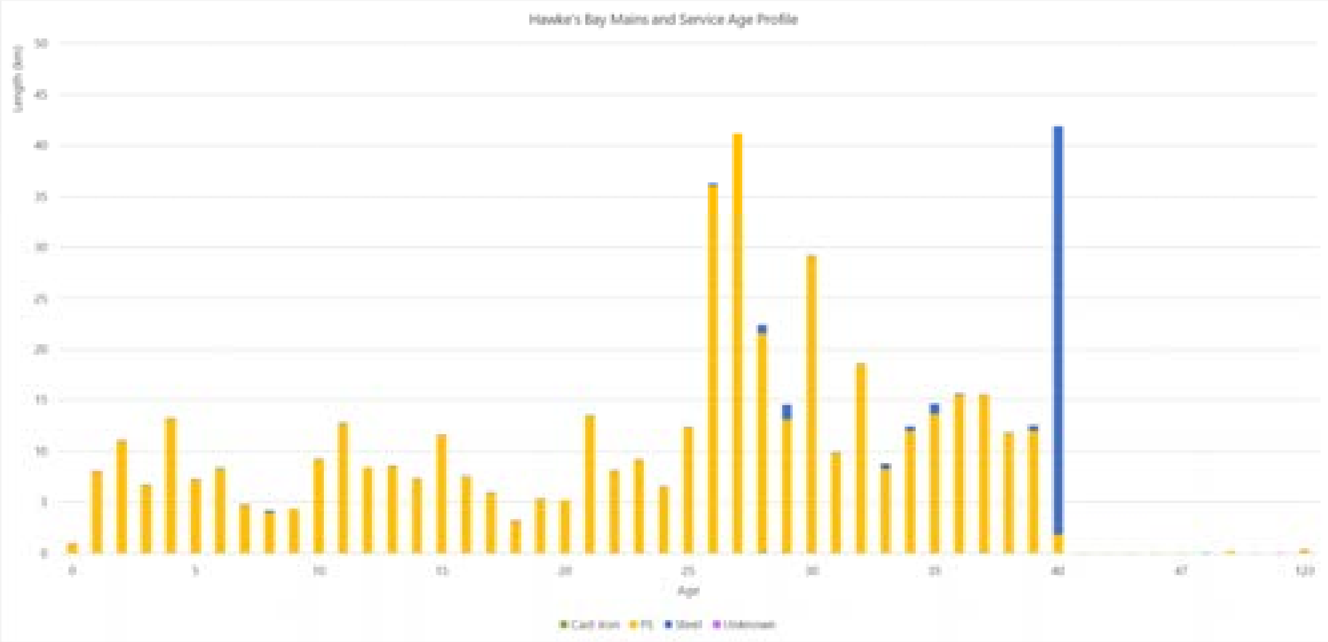
[17] Asset quantities reported in this AMP are owned by Powerco. In instances where the compound or gas gate our assets are located is owned by a third party, we record our assets only.

Figure 5.7: M&S pipes age profile for Hawke's Bay



5.1.3 Type of issues

Our M&S networks are located almost entirely underground, creating a challenge for assessing their condition and undertaking inspections directly on the materials. Instead, we use CPS on our steel networks and routine leak detection surveys as main activities on the maintenance programme for this asset type.

The two main likely failures are across our pre-85 PE and unprotected steel networks, and their performance shapes our M&S investment programmes.
Our Volume to Value Strategy introduced repair as a first step before replacement is considered, and any leaks detected on the network are addressed with high priority. We extended our repair tolerance by moving our replace philosophy from 1.5 to 3 leaks per kilometre on PE networks.

The key M&S pipe risks identified through the risk management process and FMEA are shown in Table 5.10. Each of these risks contributes to the likelihood of third-party damage (TPD), failure due to non-standard construction/maintenance, and/or accelerated deterioration of pipeline assets.

Table 5.10: Key M&S risks

Major threat	Specific threats	Consequence
Legacy construction and design	Mechanical joints	Mechanical joints are prone to full-bore failure.
	Backfill damage	Poor backfill material causes damage to buried asset, leading to leakage.
	Threaded joints	Higher likelihood of leakage through threading.
	Connection welding	Poor quality welding failure, leading to leakage.
Material failure	Pre-85 PE	Higher likelihood of material failure, leading to leakage.
	Thin-walled pipes	Higher likelihood of asset failure from intervention e.g. squeeze-offs or new service tees.
Incorrect maintenance	Inadequate CP protection	Higher likelihood of accelerated material degradation because of underperforming protection.
	Improper pipe squeezing	Higher likelihood of leakage as non-standard procedure damages asset.

Major threat	Specific threats	Consequence
Third-party damage	Working without notification	Higher likelihood of third-party damage, leading to leakage or failure.
	Directional drilling	Higher likelihood of third-party damage, leading to leakage or failure.
Poor asset information	Incorrect location	Higher likelihood of damage from people working in proximity, leading to leakage or failure.
	Incorrect material	Unplanned outage as a result of damage caused by the asset not being correctly identified.

The M&S pipe asset strategy works in conjunction with our standards and operating practices to reduce the risk to as low as reasonably practicable.

A summary of the overall M&S pipe asset conditions are shown in Table 5.11 classified by grades. Further detail of asset condition can be found in Appendix 3 as part of Schedule 12a.

Table 5.11: M&S pipe asset condition

	Asset type	Quantity (km)	Grade 1 (red)	Grade 2	Grade 3	Grade 4	Grade unknown	Data accuracy
IP	PE main pipe	3	0.00%	0.00%	17.74%	81.57%	0.69%	3
	Steel main pipe	323	0.03%	0.00%	79.43%	0.20%	20.33%	3
	Other main pipe	0.14	0.00%	0.00%	20.36%	0.00%	79.64%	3
	PE service pipe	0.40	0.00%	0.00%	67.03%	30.31%	2.66%	3
	Steel service pipe	44	0.00%	0.00%	23.44%	0.18%	76.39%	3
	Other service pipe	1	0.00%	0.00%	95.46%	0.00%	4.54%	3
MP	PE main pipe	3,574	0.15%	0.02%	93.21%	5.62%	1.00%	3
	Steel main pipe	185	2.44%	0.01%	77.16%	0.06%	20.33%	3
	Other main pipe	138	0.00%	0.00%	20.32%	0.02%	79.65%	3
	PE service pipe	1,973	0.47%	0.04%	87.23%	9.58%	2.69%	3
	Steel service pipe	207	0.00%	0.01%	23.33%	0.06%	76.60%	3
	Other service pipe	53	0.00%	0.04%	95.08%	0.02%	4.85%	3
LP	PE main pipe	4	0.00%	0.00%	57.39%	41.92%	0.69%	3
	Steel main pipe	4	0.00%	0.00%	79.67%	0.00%	20.33%	3
	Other main pipe	3	0.00%	0.00%	6.14%	14.22%	79.64%	3
	PE service pipe	4	0.00%	0.00%	88.78%	8.55%	2.67%	3
	Steel service pipe	1	0.00%	0.00%	23.39%	0.25%	76.36%	3
	Other service pipe	1	0.00%	0.00%	77.68%	17.78%	4.54%	3
Totals	**All pipes**	**6,519**	**0.17%**	**0.01%**	**57.38%**	**11.69%**	**30.76%**	**3**

They key focus areas of our asset strategy for M&S pipes are:

Pre-85 PE

PE pipes can fail primarily because of material type and quality of workmanship during their construction. To assess the condition of these assets, we have found that comparing current leakage with the historical leakage rate is the most effective method to identify deteriorating asset condition.

In the past 10 years, we have analysed failure and material testing data on PE pipelines. An industry-recognised issue for PE installed prior to 1985 is that mechanical deformation during the squeezing process makes the pipe material brittle, resulting in cracks along the pipe's body, and increasing the likelihood that leaks originate near previous repairs. Historically, squeeze-off points were rarely recorded. Additionally, service fittings and plastic welding methods used in M&S installed before 1985 are more prone to leakage compared with our current methods.

During testing, we have discovered a higher volume of thin-walled pipes than expected, particularly in the Hutt Valley and Porirua areas. Our knowledge of historical wall thickness is limited, and we are exploring methods to gather this information. All the knowledge gathered on conditions and vulnerabilities of pre-85 PE have been used to shape our pre-85 renewal programme.

As a result of the changes in our operating environment and our Volume to Value Strategy, we have conducted a thorough review and reprioritisation of our pre-85 renewal programme. The reprioritisation has been based on the improvement in data of our pre-85 pipes, a significant increase in the cost of new pipes, a reduction in approved capital expenditure by the Commerce Commission as part of our DPP3 reset, and an increase in the depreciation rate on our gas assets. Our tender review completed in 2022, showed a price increase of 10-30% for similar projects within the past cycle. This situation drove an updated approach to our acceptable leakage rate and the trigger for renewals. We now continue to repair leakage on M&S pipes before making a capital investment – a rate of three leaks per kilometre triggers a full replacement. This allows us to spread investment between repair and renewal options. The project table in section 5.1.8 shows detail of our pre-85 PE programme.

Powerco's leak detection and survey vehicle is part of our leak monitoring programme, allowing us to evaluate underperforming network areas and gather information on their condition. This valuable information will allow us to allocate our resources more effectively by focusing on areas with a high rate of leakage. The vehicle also helps us identify leaks before they are reported by the public, enabling us to take prompt action.

Steel pipe

To assess the condition of steel pipes, we employ DCVG (direct current voltage gradient) surveys and readings from CPS, which help evaluate the coating condition of the pipes. CP has its own class strategy and detail about it is provided in section 5.6.

An overall progress update on our CPS upgrade programme initiated in this cycle, shows that Wellington, Porirua, Pāuatahanui, Levin, and Palmerston North projects are now physically completed, and that we continue to deliver the remaining scope across other regions as per the programme schedule, shown in section 5.6.5.

Asset information

Our objective regarding M&S pipes is to enhance the reliability and accuracy of data pertaining to the attributes and characteristics of our assets. This includes information on their location, physical properties, criticality, and condition. Table 5.12 summarises the key information areas that we target through continuous improvement – improvements that directly influence asset risks and align with the operational needs of our network.

Table 5.12: M&S pipe asset information

Improvement	Issue	Reason
Location	Accuracy	Improved location information will assist with the prevention of third-party damage.
Wall thickness	Completeness	Thin-walled pipes have increased leakage rates, understanding where these are located will assist with renewal planning.
Strategic pipes	Accuracy	Redeveloping strategic pipe models will prevent unnecessary operational spend and assist with the prevention of third-party damage on strategic mains.
Asset age	Accuracy	The reduction in the number of mains with an assumed installation date will assist with renewal planning, particularly for pre-85 mains.

5.1.4 Design and construct

The anticipated lifespan of distribution pipes is determined by the Commerce Commission and can be found in Table 5.13.

According to the Commission's guidelines, the lifespan of M&S pipes is based on the nominal operating pressure. Traditionally, steel pipes have been used for IP applications, while PE pipes have been used for medium pressure (MP) applications. However, it is important to note that there are instances where MP steel and IP PE (PE100) pipes are used in circumstances that deviate from the conventional material selection. As a result, we have adjusted the expected life for MP steel and IP PE pipes in our Asset Management System. Additionally, as described above, there are well-known issues with pre-85 pipes. These pipes have a shorter lifespan because of factors such as brittleness, inadequate wall thickness, and substandard construction practice.

Table 5.13: Life expectancy of M&S pipes

Material	Sub material/pressure	Expected life (years)
Steel pipe	All IP	60 to 70
	All MP and below	50 to 60
PE	PE80 – Post-85	50 to 60
	PE80 – Pre-85	40 to 50
	PE100 (IP)	60 to 70
Cast iron	All	20 to 30

Powerco’s engineering design and construction standards establish all the requirements for safety, quality and reliability of our M&S networks. These standards incorporate conditions required to comply with regulatory and statutory obligations, while incorporating new technologies, construction and repair methodologies. We also have new tools that allow us to manage and work on these assets more effectively. These new tools are described in more detail in the New Technology section in Chapter 4.

5.1.5 Renewal

The majority of our M&S pipes are in satisfactory condition (92%) and a significant portion of the network is relatively new. Therefore, our pipe renewal plans primarily focus on critical areas where three or more leaks per kilometre have been detected. As described above, the most common networks in our renewal programme are unprotected steel and pre-85 PE pipes.

Our Volume to Value Strategy has a strong influence in the renewal area, as it requires us to consider and weight alternative repair options to find the best investment opportunity. This means our investments are focused on the renewal of the right asset at the right time for the right cost, while maintaining optionality and assets that can deliver green fuel in whatever form is needed.

In the past, when renewing M&S pipes, there have been instances where sections of steel pipes have been interrupted with PE. This has created segments of potentially unprotected steel within our network. We are currently examining these sections and developing plans to replace them with PE pipes to ensure their protection.

The M&S pipe works are treated as individual projects, focusing on the renewal or replacement of pipes to effectively reduce associated risks. These projects are undertaken based on the specific circumstances of the pipework, considering factors such as the environment or location in which they are situated and usage demand now and in the future.

In the context of the pre-85 pipe replacement model, the threshold for determining the replacement point has shifted from 1.5 to 3 leaks per kilometre of pipe. This change allows us to effectively optimise our cost of ownership between repairing leaks prior to replacement.

We adopt a reactive approach to determine the appropriate course of action in instances where customers make changes to their installation without informing us (homeowners make modifications to their properties, new appliances etc) or pipes are found to be historically installed in a way that no longer complies with the safety standard.

We have also implemented new technology and innovative approaches across our day-to-day activities that help extend the lifecycle of our M&S. Technologies mentioned in Chapter 4, such as the Ravetti and Friatec/TD Williamson flow-stop, combined with the use of hydro excavation equipment (instead of mechanical digging) have a positive impact on the life of our assets by significantly reducing the potential for damage during normal operations; and by default, reducing the expected number of renewals.

5.1.6 Operate and maintain

One of the significant risks to M&S is third-party damage. To minimise the likelihood and impact of such damage, we have implemented a notification system that requires third parties to inform us when they are working near our assets. Pipes that have a significant impact on delivery or are in high-consequence areas are designated as strategic and require close oversight from our regional contractors. Additionally, regular maintenance is conducted on pipeline warning signage to aid in their identification.

Once PE pipelines are installed, they do not require direct maintenance. On the other hand, steel pipelines need corrosion protection systems, specifically cathodic protection, which can be achieved through impressed current or sacrificial anodes. For more details on the operation and maintenance of these systems, please refer to section 5.6.

The main operational costs associated with M&S pipes are related to leakage management, inspections, and responding to faults during events. These aspects are detailed in our strategies for public safety and network integrity. The leakage inspection cycles for pipes by type are shown in Table 5.14 below.

Table 5.14: Mains and service pipe leakage survey frequency

Asset type	Annually	Five-yearly
Mains and service pipes in high density community usage area	X	
Steel pipeline when CPS is faulty	X	
Other pipes not covered above		X

5.1.7 Dispose

The disposal of M&S pipes is not common on our network because of the high cost associated with their removal. Instead, when a pipe is no longer needed, we choose to decommission it and leave it in the ground, indicating in our records that it is out of service. In some cases, when a section of the pipe obstructs other assets, we may remove that specific section while leaving the remaining portion in the ground, following the same approach as previously mentioned. The physical disposal of these assets is carried out by our service provider, ensuring compliance with all environmental regulations and requirements.

5.1.8 Expenditure

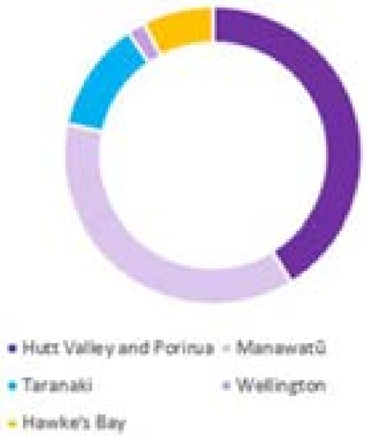
Figure 5.8 shows the expenditure programme across our M&S pipes, with 96 projects forecast during the planning period, and an expected $30.3 million of investment across capital and complex operational expenditure on our networks. Of the 96 planned projects, 13 are in our 2024 GWP (next 12 months), combining for a total of $1.07 million in FY24. These figures are derived from our TPK Issues Register and represent our 10-year forward programme. Note, some projects are in our TPK, adding to our project count, but are yet to have a price set.

Figure 5.8: M&S pipe expenditure programme

Investment programme
(Opex + Capex)
$30.3m

Projects in the pipeline
96

Regional expenditure forecast



GWP 2024
Number of projects:
13

Forecast expenditure
(Opex + Capex)
$1.07m

Table 5.15 contains the 13 M&S projects in the 2024 GWP (next 12 months). The other projects in the pipeline can be found in section 8 Expenditure Plan Summary and Maps, set out by region.

Table 5.15: GWP24 M&S projects

Project description	Project region	Expenditure category	GWP24 design/ construct	Description of works
Waddington Drive pre-85 replacement	HVP	Capex	Construct	Replacement of a leaky 100NB PE80 mains pipe installed in 1976 that was causing a public safety hazard.
Woodvale Grove replacement	HVP	Capex	Design	700m of 80NB pre-85 mains has leaked 18 times in the past 10 years. Replacement will increase reliability of gas delivery in this area.
Stanhope Grove replacement	HVP	Capex	Construct	Replacement of 700m of leaky pre-85 main with 15 leaks recorded in the past 10 years.
Omapere Street pre-85 replacement	HVP	Capex	Construct	500m 100NB PE80 in Waitangirua has leaked six times since 2020.
Harbour View Road renewal	HVP	Capex	Construct	Replacement of ~500m of 80NB pre-85 pipe that has recorded more than 12 leaks within the past four years.
Havelock Avenue steel isolation improvement stage 1	MAN	Capex	Construct	Replacement of low-quality steel MP pipe in Palmerston North while also installing four isolation valves to improve reliability.
Bedford Court LIP removal	HVP	Capex	Construct	Decommissioning of LIP main because of leakage defects. Join to existing PE main with 110m of new PE.
Feilding-Sanson HMP signage	MAN	Opex	Construct	Signage along the HMP pipeline from Feilding to Sanson was identified to be either missing, incorrect, or insufficient. Install standard Powerco signages along the pipeline and remove redundant or superseded signage.
Hutt IP gas main replacement	HVP	Opex	Construct	Repair of 1.3m of dented IP main due to external damage. Potential leak risk that will need to be either clamped or removed to eliminate safety and delivery concerns.
Whitireia Polytechnic GMS	HVP	Capex	Construct	Corroded IP inlet valve and pipework in bad condition needs to be replaced and treated for corrosion where appropriate.
Manawatū LIP signage	MAN	Opex	Construct	Taranaki Street signage indicates gas network owned by previous owners. Scope is to remove non-Powerco signage and install general street signage.
Jamaica Drive pre-85 replacement	HVP	Capex	Construct	Replacement of 3.2km of pre-85 pipeline that has had 14 recorded leaks. Roll-over project that will have the finishing touches in FY24.
Taranaki signage	TAR	Opex	Construct	Taranaki signage indicates gas network owned by previous owners. Scope is to remove non-Powerco signage and install general street signage.

5.2 District regulator stations (DRS)

After M&S pipes, district regulator stations (DRS) are our second largest network asset class by value. Their primary function is to reduce pressure in our network. DRS are among Powerco’s most technically complex asset types because of their intricate construction, maintenance, and componentry. All stations on our network were above ground, with exception of a few, until 2003 when modular underground stations were introduced to improve public and asset safety.

This asset class accounts for 1.77% of our total Regulated Asset Base (RAB) value.

Asset class dashboard

Figure 5.9 shows the DRS asset class dashboard, highlighting:

- Asset condition 2023 is reflective of Schedule 12a, and grading system categories defined in Table 5.2.
- $8.35 million of capital and operational investments spread across 62 planned and forecast activities.
- Operational investments are defined as being complex in nature, requiring detailed planning and project management oversight.
- The work programme comprises 23 station renewals, nine rationalisation projects, and six capacity upgrade projects.
- We have 125 DRS on our IP network and 65 on our MP network.

Figure 5.9: DRS asset class dashboard

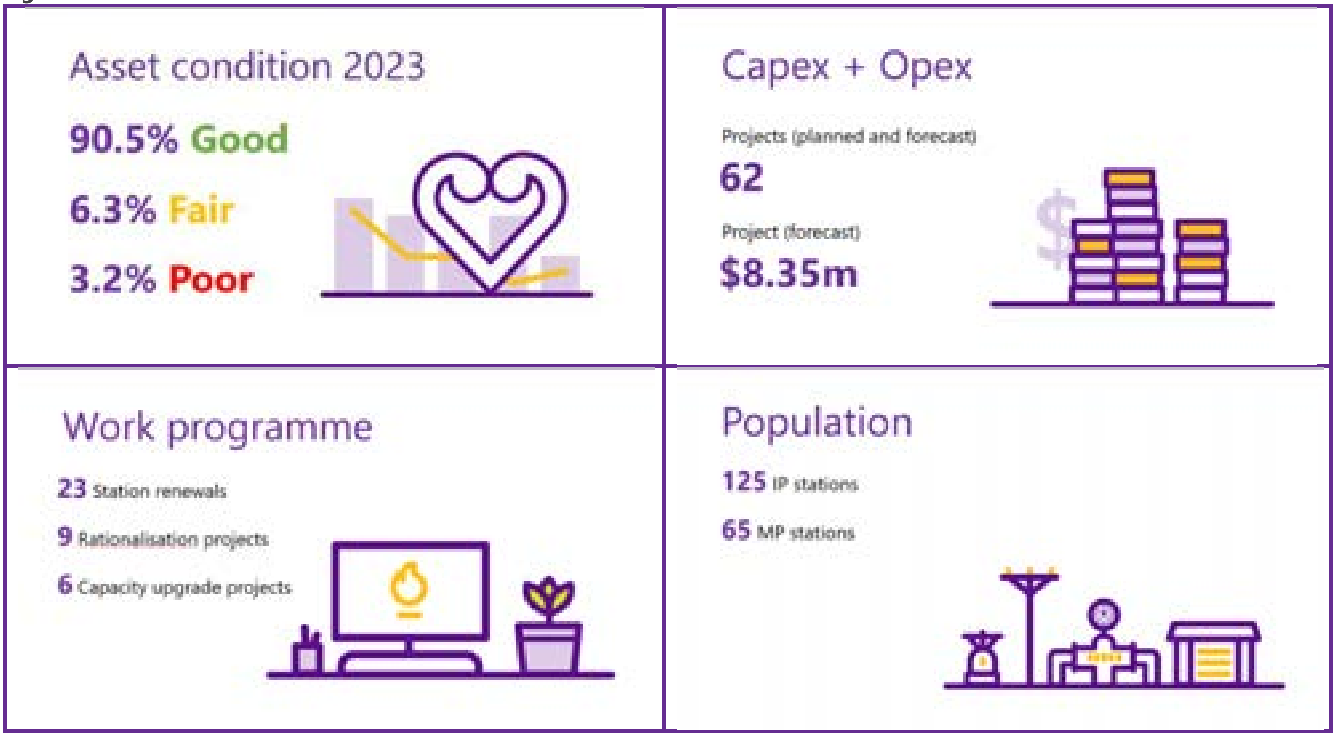


Table 5.16 describes the above ground and below ground stations utilised in our network. To support reliability-centred maintenance (RCM), stations are further classified into two categories based on delivery criticality, as shown in Table 5.17. The Strategic Asset Class Plan for regulator stations is being updated later in 2023. This will involve re-evaluating the FMEA to give specific guidelines around regulator stations to inform technical standards and asset lifecycle plans, while focusing on the Volume to Value Strategy.

Table 5.16: Description of Powerco's DRS types

Station type	Description
Above ground stations	Above ground stations. These include regulators, filters, valves and facilities (building or enclosure).
Below ground stations (Cocons)	Under ground station units called 'Cocons'. They are not prone to vehicle collision and limit the visual nuisance, especially in the urban environment.

Table 5.17: Description of Powerco's DRS classification

Classification	Description
District regulator station (DRS)	Either ≥500 customers[18] or ≥100 customers, including at least one critical customer.
Pressure regulation station (PRS)	5-500 customers.

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[18] Commercial customers calculated in residential customer equivalents.

5.2.1 Asset class objectives

Contributing towards the delivery of a better energy future to our customers by providing a consistently safe, reliable, resilient, and cost-effective gas network now and into the future, the primary objectives for regulator stations are:

- To regulate and control pressure systems across our networks.
- To efficiently reduce the total number of unplanned gas releases and outages resulting from asset failure.
- To reduce public safety risks.
- To maintain a high visual appearance standard.

Analysing these objectives has identified the primary cause of risks are third-party interference (TPI), legacy design, and non-standard operation/maintenance. These risks are addressed within our asset class lifecycle management plans, which focus on minimising and eliminating these risks to ensure our stations remain safe, efficient, reliable, and aesthetically pleasing.

5.2.2 Asset class overview

Across our regions of operation, we have 190 regulator stations installed. Since we began undergrounding stations in 2005, we have installed 53 underground stations across our network. Undergrounding stations in high-density community areas (HDCU) became part of our asset class strategy in 2012, resulting in an increase in the rate of underground stations installed.

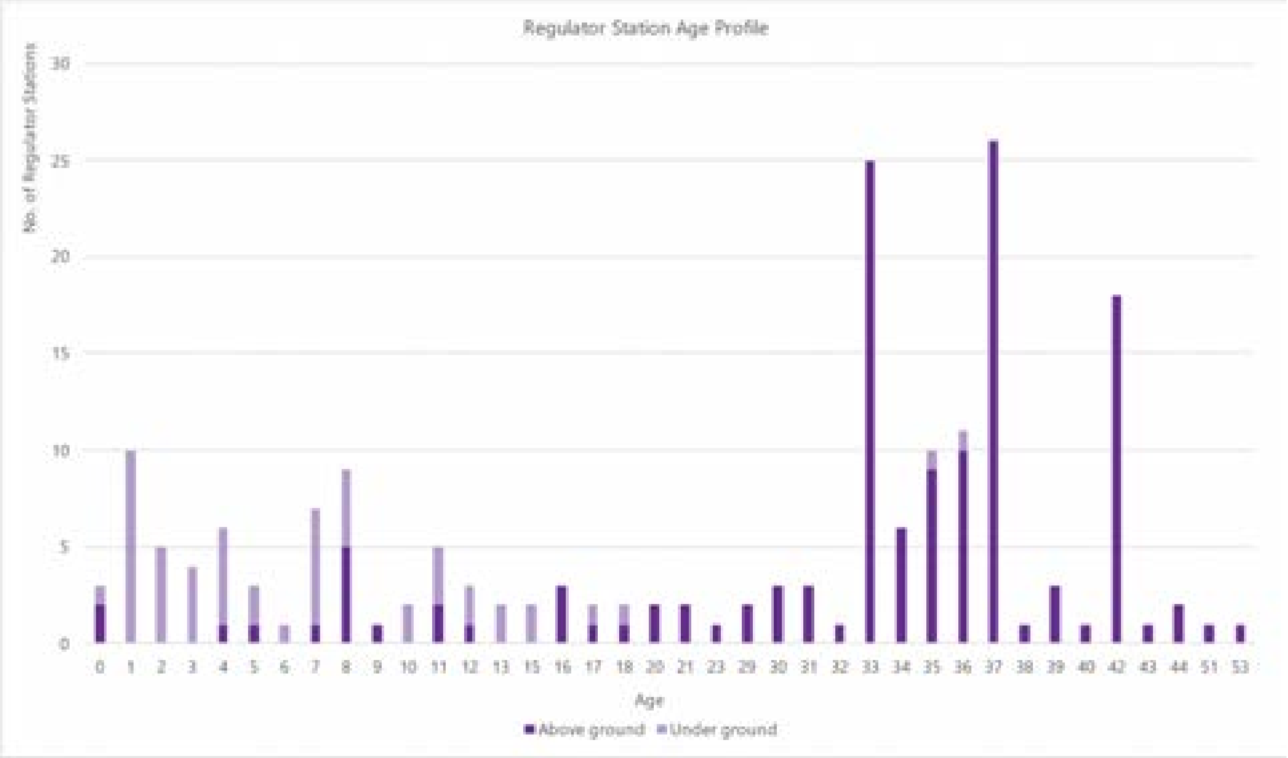
Table 5.18 provides a breakdown of the types and operating pressures of our regulator stations, along with their average age, which is an indicator of the overall health of the assets. By understanding the distribution and condition of our regulator stations, we can better manage and maintain them to ensure they continue to perform as designed. Figure 5.10 shows the age profile of our regulator stations by type.

Table 5.18: Total number by region, type and pressure

Region	Type	Total stations	IP stations	MP stations	Average age (years)
Wellington	**Total**	**47**	**30**	**17**	**18**
	Above ground	26	12	14	27
	Below ground	21	18	3	8
Hutt Valley and Porirua	**Total**	**48**	**38**	**10**	**26**
	Above ground	32	27	5	37
	Below ground	16	11	5	4
Taranaki	**Total**	**23**	**18**	**5**	**27**
	Above ground	16	11	5	31
	Below ground	7	7	0	19
Manawatū and Horowhenua	**Total**	**59**	**27**	**32**	**29**
	Above ground	52	21	31	33
	Below ground	7	6	1	2
Hawke's Bay	**Total**	**13**	**12**	**1**	**43**
	Above ground	11	10	1	51

Region	Type	Total stations	IP stations	MP stations	Average age (years)
	Below ground	2	2	0	3
All regions	**Total**	**190**	**125**	**65**	**37**
	Above ground	137	81	56	34
	Below ground	53	44	9	7

Figure 5.10: DRS age profile



5.2.3 Type issues

Table 5.19 shows the regulator station excerpt of Schedule 12a in Appendix 3, classified by pressure regime. Our preventative maintenance programme is implemented through six-monthly PRS and 12-monthly DRS inspections. As a result, most of our IP and MP stations are in a condition as to be expected at their age, as defined in Table 5.2: Condition grading definition and application.

Table 5.19: Regulator station asset condition

Asset type	Quantity	Grade 1	Grade 2	Grade 3	Grade 4	Grade unknown	Data accuracy
IP stations	125	3.20%	4.80%	64.80%	27.20%	0%	3
MP stations	65	3.08%	9.23%	67.69%	20%	0%	3
Total	**190**	**3.16%**	**6.32%**	**65.79%**	**24.74%**	**0%**	**3**

The implementation of FMEA for regulator stations has led to the identification of the significant risks associated with the operation and maintenance of our stations. The result of this analysis is summarised in Table 5.20.

The primary risk areas for our regulator stations relate to public safety hazards, component failures, and issues arising from non-standard design, construction, and maintenance practices. To mitigate these risks, our asset class strategies are actively promoting changes within our standards and identifying relevant projects. These initiatives aim to minimise or eliminate the occurrence of such risks. Additionally, we provide clear instructions for adjusting processes in the field when these risks are identified.

The next review of our regulator stations FMEA is scheduled for 2023-24.

Table 5.20: Key regulator station risks

Major threat	Specific threats	Consequence
Legacy construction and design	No fire valves	Inability to shut down station in emergency.
	Threaded joints	Higher likelihood of leakage through threading.
Component failure	Over pressure shut off (OPSO)/Relief failure to activate	Overpressure in downstream network resulting in violation of maximum allowable operating pressure (MAOP).
	Premature OPSO activation	Early activation of the OPSO valve due to vibration, leading to loss of supply to customers.
Incorrect maintenance	Incorrect OPSO/ relief set pressure	Overpressure of downstream network resulting in violation of MAOP or early activation leading to loss of supply to customers.
	Inoperable or buried fire valve	Inability to shut down station in emergency.
Third-party interference	Vandalism or interference	Third-party interference on asset leading to leakage or unplanned outages.
	Vehicle impact	Vehicle impact, leading to gas exposure, fire or loss of supply to customers.

Most of our regulator stations are above ground, meaning we can perform asset condition assessments and inspections on stations every 6-12 months, ensuring the critical components on some of our most complex assets are performing as designed. This also applies to our below ground stations, which can be accessed from a hatch at ground level.

However, above ground regulator stations are exposed to the risk of external damage, such as impact by vehicles or vandalism. Therefore, the addition of underground stations to our warehouse in 2003 improved overall station performance by reducing downtime. As a result, we still have a programme to replace above ground stations with below ground stations (Cocons) in high-density community areas, such as in the Wellington CBD.

Leaks through threaded piping connections represent a systematic issue at our stations. An update of our engineering design and construction standards addressed this problem by incorporating flange connections to these types of joints.

In 2022, a valve failed by ejecting the valve head. This resulted in a change to the risk profile of our stations, which has been formally captured in the 2023 review of our Formal Risk Assessment.
An investigation highlighted that the valve type that failed was found across the Hutt Valley and Porirua region on IP stations installed before 1980. As such, we launched a survey across all IP stations in the region to identify and quantify how many stations could be affected. In total, 71 stations have been inspected, with just three (4%) found to have this valve type. We continue to evaluate the remaining stations to define the scope and initiate a replacement programme.

Asset information

On top of the general population and life expectancy data, as disclosed earlier in this section, Powerco stores various other characteristics of our regulator stations to benefit asset strategy. Our goal with regulator station asset information is to improve our data confidence about the components within the stations and their associated characteristics, letting us plan for maintenance and renewal with higher confidence. The introduction of our new Asset Management System (SAP) in 2019 allowed us to store this information explicitly for each station. Before 2019, we only recorded this for our critical stations. Since 2019, we have enhanced the completeness of our dataset by adding the inlet and outlet pressures for each station. This improves our modelling and planning efficiency, as it lets us model future network developments with improved accuracy. Table 5.21 shows the key characteristics we store for each of our stations.

Table 5.21: Asset information

Improvement	Issue	Reason
Regulator type	Completeness	Improved accuracy with maintenance planning, ensuring we have the correct equipment and soft parts if maintenance is required.
Regulator protection type	Completeness	Required for network safety assessments.
Regulator model	Completeness	Required for accurate station capacity assessments.
Regulator orifice diameter	Completeness	Required for accurate station capacity assessments.
Regulator inlet and outlet pressure	Completeness	Required for modelling/planning efficiency and maintenance planning, ensuring that we can plan for future developments with correct data and that we have correct parts and equipment if maintenance is required.

5.2.4 Design and construct

Because of the complexity of our regulator stations, historically we have bundled all componentry for each station into a single equipment record in our AMS, except for our major stations, such as the Tawa Gas Gate. The bundling approach has led us to set the life expectancy of regulator stations to 35 years, which aligns with the lifespan of most components making up a station.

In 2023, it was noticed that the Commerce Commission was using a lifespan of 25 years to establish the health condition of regulator stations. This assumption impacted the estimated state of assets, creating a change from 44% over age at 35 years, to 65% over age at 25 years. These findings instigated an internal investigation into the physical condition of regulator stations against age. Through analysis of population, maintenance, and financial data, there was no clear evidence of age-related failures or damages in Powerco’s stations, implying that there is no real correlation between the physical condition and age of 25-year and 35-year asset lifecycles. As a result of this check, we consider our current maintenance regime to be sufficient.

The principal objective in the design and construction of a Powerco regulator station is that it satisfies safety, reliability and capacity requirements, and the regulation and statutory obligations set out by the Commerce Commission, and industry.

Our engineering standards and specifications are updated frequently to incorporate new technology, construction methods and materials, assuring quality across our stations.

5.2.5 Renewal

Renewals of our regulator stations are driven by safety and efficiency improvements, and our Volume to Value Strategy. When a station is determined to be ready for renewal, it is cross-checked against our network strategies (refer to Chapter 6), to ensure it meets resilience and redundancy requirements, is designed with sufficient delivery capacity and the renewal is considered against the Volume to Value Strategy to ensure the replacement is more effective than a refurbishment or maintenance plan.

Stations feature heavily within our renewal expenditure forecasts as they have a relatively low life expectancy, and they are highly critical to the distribution of gas throughout our network. Powerco's focus on continual improvement is shown through the rationalisation of the number of stations on our network and the standardisation of the types of stations we install, improving the overall efficiency and maintenance requirements of our network.

Future station renewals have been determined using the results of the 2012 and 2019 risk assessments. These highlighted the main risks of above ground stations in an emergency event situation. The results of these assessments were used to decide which stations were of highest risk and, therefore, were of top priority.

Supplementing the risk assessments, a variety of further criteria are also considered in our renewal planning to decide which should be carried out first. These include location, capacity, network rationalisations and analysis of defects. A health check was carried out on regulator stations in 2023 and it was determined that the number of defects logged against a station had little correlation with its age or performance. These findings, combined with our Volume to Value Strategy, mean that the age of a station will very rarely be used to instigate a renewal going forward. The culmination of these factors determined which stations were in most need of a renewal and were subsequently put into our TPK. These are still being carried out through FY24 because of resource limitations.

A review of our station design standard in 2022 found that a station should not necessarily be undergrounded when due for renewal. Undergrounding should be the preferred renewal option to reduce public safety risk in areas with heavy traffic, but where applicable, components should look to be replaced and maintained, rather than a full station replacement or relocation, conforming with our Volume to Value Strategy. This also provides more flexibility for above ground stations for future equipment changes during the transition period to renewable gas, as above ground pipework is cheaper and easier to alter.

The adoption of contemporary maintenance tools, such as Lockring (mentioned in Chapter 4), will allow the quality of stations to be maintained across the lifecycle, directly impacting the need for renewals.

5.2.6 Operate and maintain

The primary function of our pressure reduction facilities is to provide a safe and reliable delivery of gas at the required volumes. To ensure this function is met, Powerco carries out routine inspections for maintenance on our stations – every six months for DRS and every 12 months for PRS. The following standard operations are carried out every inspection.

- Every year, the operating stream is switched from 'working' to 'standby' to reduce wear on the current working stream.
- Outlet pressure is checked and adjusted if necessary.

The following activities are undertaken every six months and, if they do not meet the standard, they are corrected on-site. If this is not possible, a work order is raised to correct it at another time.

- Check for leaks.
- Over pressure shut-off valves (OPSO) are confirmed open and reset if required.

- General inspection of pipework and identify any evidence of corrosion.
- Ensure the general condition and integrity of the enclosure is maintained.
- Filters are checked and stripped if necessary.
- Flange insulation kits are checked on stations with CP, ensuring they are isolated from the system.

On top of the six-monthly/annual inspections, our stations are on 10-yearly inspection plans. These inspections signal a refurbishment of pressure protection equipment where possible or replacement, if required. The facility is also cleaned if required, which includes sandblasting and repainting the stations. The soft parts of the regulators themselves are also changed, if required.

In 2022, the operations and maintenance standard for regulator stations was revised considering feedback since the first issue in 2014. Minor additions to the general routine and preventative maintenance sections were made and the reactive maintenance operations were updated with more pressure delivery defects and paint system touch-up requirements.

5.2.7 Dispose

Our preferred method of disposing of a regulator station is to fully remove the station, and any related equipment, and to restore the site to its condition before installation. Any station causes a health and safety risk to the public if not removed, and requires ongoing maintenance and monitoring, incurring additional operational spending. All decommissioned pressure reduction assets are assessed for suitability for refurbishment and subsequent reuse. If they are found to be unsuitable, our service provider disposes of the physical assets in compliance with all environmental requirements.

5.2.8 Expenditure

Figure 5.11 shows the expenditure programme across our regulator station assets, with 62 projects forecast during the planning period, and an expected $8.35 million of investment across capital and complex operational expenditure on our networks. Of the 62 planned projects, 27 are in our 2024 GWP (next 12 months), combining for a total of $2.07 million in FY24. These figures are derived from our TPK Issues Register and represent our 10-year forward programme. Note, some projects are in our TPK, adding to our project count, but are yet to have a price set. The figures stated are accurate up to July 2023.

Figure 5.11: DRS expenditure programme

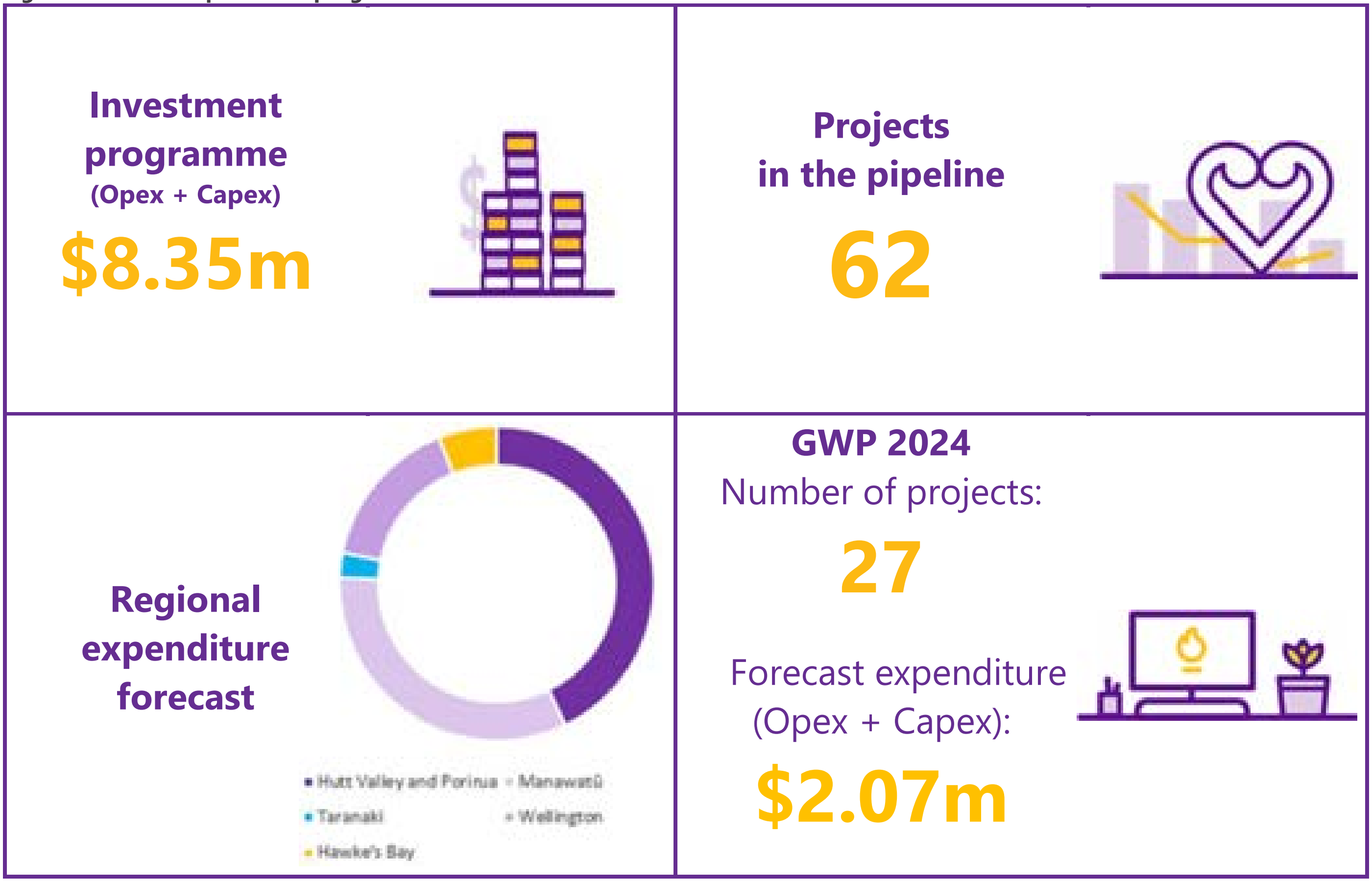


Table 5.22 contains the 27 regulator station projects in the GWP for 2024. The other projects in the pipeline can be found in section 8 Expenditure Plan Summary and Maps, set out by region.

Table 5.22: GWP24 regulator station projects

Project description	Project region	Expenditure category	GWP24 design/ construct	Description of works
Middleton Road DRS renewal	WEL	Capex	Construct	Unable to isolate station that is within a HDCU because of a missing fire valve. In an emergency that requires immediate isolation, all of Wellington will need to be shut off. This project was deferred from FY20 because of a change in scope, driven by the need to renew the regulator componentry. It was decided that the best solution was a full undergrounding and a renewal, leading to further design and increased construction cost.
Karori and Chaytor regulator renewal	WEL	Capex	Design	The renewal of two old regulators that no longer have available parts. Also, addressing of corroded pipe work and paint job. Needed to ensure asset reliability and safety.
Levin Gas Gate renewal	MAN	Capex	Construct	Two above ground regulators have leaks and six of the plug valves have seized because of old age. Renewing DRS will improve the reliability of supply to the Levin network.
Warspite Avenue PRS renewal	HVP	Capex	Design	Renewal of corroded and leaking 43-year-old PRS with faulty dresser plug valve that feeds 20 customers.
Metro Glasstech PRS rationalisation	HVP	Capex	Construct	Station rationalisation and 450m mains extension to eliminate the need to renew the old station in need of renewal.

Project description	Project region	Expenditure category	GWP24 design/ construct	Description of works
34-36 Dragon Street service regulator removal	HVP	Capex	Construct	Leaking service regulator feeding three medium sized customers is due for renewal, but analysis against Volume to Value Strategy means it is to be removed and replaced with three large GMS.
Devon Street service regulators	TAR	Capex	Design	Approximately 70 service regulators on Devon Street in New Plymouth are coming to the end of their expected life. Various solutions are proposed for each of the 70 regulators, including relocations, renewals, and live risers.
Connett Road DRS renewal at New Plymouth Gas Gate	TAR	Capex	Design	Renewal of corroded strategic DRS that is one of two stations feeding 1,000 ICPs in Bell Block North. Also supplies the airport.
Kākāriki DRS renewal	TAR	Capex	Construct	Replacement of single stream DRS with heavily corroded isolation valves.
Georges Drive DRS and SCADA relocation	HAB	Capex	Construct	SCADA box was flooded in 2020 meaning either a relocation or breather lines are required for continued monitoring of gas and to ensure pressures are not outside specified levels.
Simla Crescent DRS renewal	WEL	Capex	Construct	Renewal of DRS within compound to address multiple corrosion defects on the station valves, regulator control manifolds and pipework.
Truscott Grove PRS rationalisation	MAN	Capex	Design	Removal of Truscott Grove PRS and relaying of pre-85 PE to safely uplift the street and nearby GMS to MP.
Hokio Beach rationalisation	MAN	Capex	Design	Investigation into best option for the remaining lifecycle of two stations within 400m, both in poor condition. A mains extension to join the two PRSs to the gas gate is a potential solution.
Champion Street DRS renewal	HVP	Capex	Design	Full above ground renewal of badly corroded 41-year-old DRS that feeds 50 ICPs.
Dover Street DRS standby stream cartridge swap	WEL	Capex	Design	The standby stream of newly installed Cocon 26 has a non-standard cartridge configuration. For reliability purposes the cartridges are to be replaced.
Ohiro DRS regulator replacement	WEL	Capex	Construct	Ohiro DRS has regulators that no longer have soft parts available. Separate project to spray and repaint Ohiro DRS will be carried out at the same time as regulator replacement to capitalise investment.
Wilton DRS regulator replacement	WEL	Capex	Construct	Wilton DRS has regulators that no longer have soft parts available. Separate project to spray and repaint Wilton DRS will be done at the same time as regulator replacement to capitalise investment.
Queens Wharf DRS renewal	WEL	Capex	Construct	Replace 30+-year-old regulator with below average pipework and parts that are no longer available. To be replaced with two Cocon 26 units with ancillaries.
Union Street SR renewal Hāwera	TAR	Opex	Design	Several heavily corroded service regulators around Union Street with open amber defects that have degraded past general repair state. All service regulators (SR) with the open defects are to be renewed or removed depending on the status of the reliant customers.
Wilson/Boulcott Street PRS alteration	WEL	Capex	Construct	Vertical construction of PRS poses a fall hazard for service providers maintaining the PRS, as well as lack of bypass, which reduces reliability. Station is to be upgraded, reconfiguring to a horizontal layout and a bypass stream with new outlet valve.
Waitangirua corrosion protection	HVP	Opex	Construct	Vertical construction of PRS poses a fall hazard for service providers maintaining the PRS, as well as lack of bypass, which reduces reliability. Station is to be upgraded, reconfiguring to a horizontal layout and a bypass stream with new outlet valve.
Taylor Preston DRS renewal	WEL	Capex	Construct	Old corroded station overrun with weeds to be relocated and replaced, also installing a fire valve.
Butavas Street PRS removal	WEL	Opex	Construct	Removal of station because of high required refurbishment costs, and it has little effect on the high droop in the area. Removal was confirmed to be viable based on FY23 trial.

Project description	Project region	Expenditure category	GWP24 design/ construct	Description of works
Queen Street DRS compound renewal	MAN	Capex	Construct	Replacement of corroding DRS compound that has open amber defect.
Hutchen Place reinforcement	TAR	Capex	Construct	Main servicing several large customers at Port Taranaki. Have exceeded 60% droop and declined load increase requests. Installation of new PRS will improve pressure through Hutchen Place.
Hāwera Gas Gate pipework	TAR	Capex	Construct	Downstream pipework at Hāwera Gas Gate is in poor condition, scope will repair pipe supports, realign underground outlet pipework, and install concrete pad.
Devonport Apartments PRS rationalisation	TAR	Capex	Construct	Three PRSs with complex interior pipework increasing safety risk. Remove three existing PRSs and replace with two new stations. A full meter survey will be undertaken after the works to confirm acceptable condition of all installations.

5.3 Main and service valves (VAL)

Representing 1.22% of Powerco's assets base (RAB value), the main and service valves (VAL) are manufactured out of steel and PE. The type of valves we use in the network are shown in Table 5.23.

Table 5.23: Description of Powerco's valve types

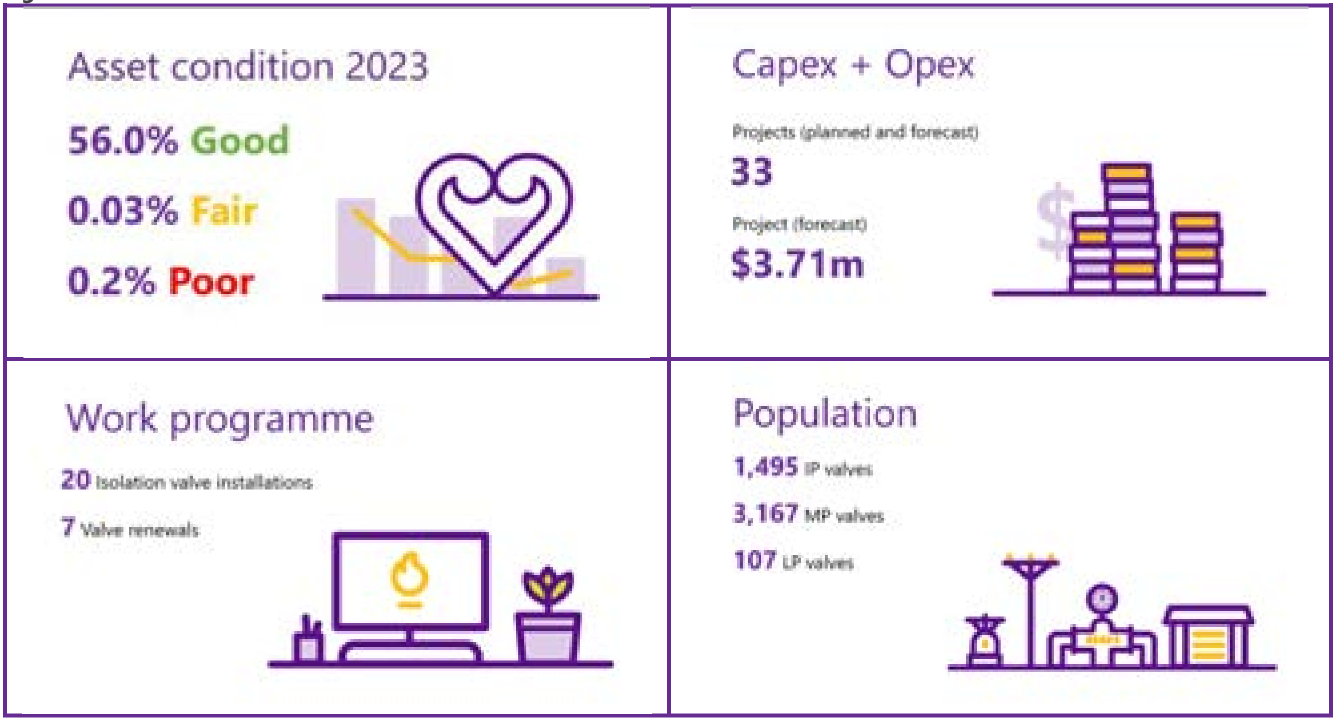
Type	Description
Main (line)	Installed inline on main pipelines, used for isolating sections on the network.
Service	Installed inline on service pipelines, used for isolating customers.
Station	Installed within regulator stations and are not covered in this section, see section 5.2 for more information.

Asset class dashboard

Figure 5.12 corresponds to the VAL asset class dashboard, highlighting:

- Asset health 2023 is reflective of Schedule 12a, and grading system categories defined in Table 5.2.
- $3.71 million of capital and operational investments spread across 33 planned and forecast activities.
- Operational investments are defined as being complex in nature, requiring detailed planning and project management oversight.
- The work programme that comprises 18 isolation valve installations and seven valve renewals.
- A population of 1,495, 3,167 and 107 valves on our IP, MP and LP networks respectively.

Figure 5.12: Line and services valves asset class dashboard



5.3.1 Asset class objectives

Contributing towards the delivery of a better energy future to our customers by providing a consistently safe, reliable, resilient, and cost-effective gas network now and into the future, the primary objectives for VALs are:

- To enable quick, reliable isolation of specific sections of the network or individual customers when necessary.
- To reduce public safety risks.
- To ensure valves are easily operable, identifiable, locatable and leak free.

VALs on our network are typically in a fixed position, either open or closed, and they are only operated when dealing with faults or emergencies, or when delivering routine planned works.

By analysing events and defects, we have identified that the main causes of risk are TPI and non-standard construction or operation practices. Through our maintenance programme, we identify valve models not performing to expectations. Investigations are now in place to understand the extent and conditions of these valve types. By proactively addressing TPI and ensuring adherence to standard construction and maintenance practices, we can enhance the reliability and safety of our network.

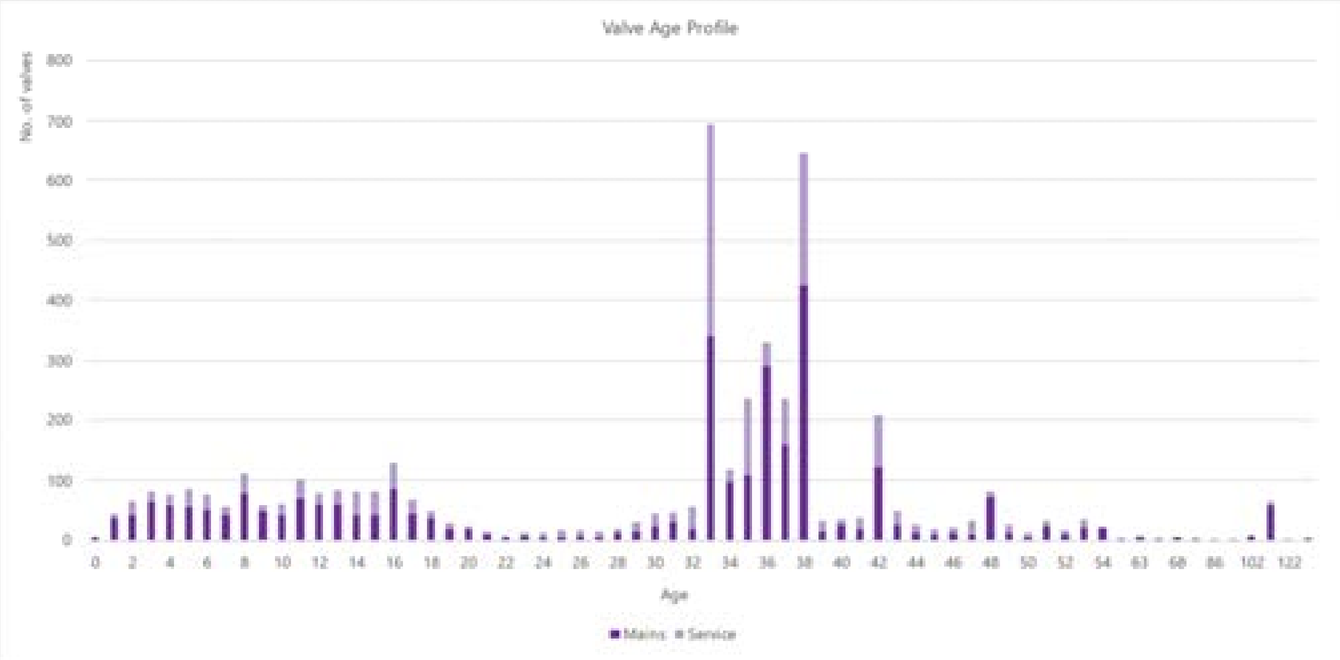
5.3.2 Asset class overview

Table 5.24 shows the type and quantity of VALs by operating status and pressure systems. Figure 5.13 shows the age profile of our valves.

Table 5.24: Total number by type, pressure and status

Type	Pressure	Total	In service	Average age (years)[19]
Main	IP	828	536	29
	MP	1,842	1,217	23
	LP	58	31	19
	NP	342	46	9
Service	IP	515	277	33
	MP	1,002	542	23
	LP	38	13	24
	NP	144	12	20
Total	All	4,769	2,674	25

Figure 5.13: VALs age profile



The VALs FMEA shows there are similar risks to those found in our M&S pipes asset class. This is expected as both asset classes are part of our underground systems. Table 5.25 highlights key risks identified for our underground valves.

The valve asset strategy of continuous improvement drives the identification of improvement projects and process adjustments to minimise or eliminate risks.

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[19] In-service valves only

Table: 5.25: Key valve risks

Major threat	Specific threats	Consequence
Legacy construction and design	Valve lid not flush with ground level	Public safety risk due to tripping hazard.
Material/ component failure	Corrosion (steel valves)	Increased likelihood of leakage.
	Valve spindle failure	Valve spindle breaks when being operated, inability to isolate network or customers.
Incorrect maintenance	Valve inoperable	Inability to isolate network or customers.
	Identification label missing or unreadable	Inability to isolate network or customers in emergency or accidental isolation of incorrect sector or customers.
	Valve unlocatable	Unlocatable valve, unable to isolate network or customers.
	Missing or broken valve lid	Public safety risk due to tripping hazard.
Third-party interference	Valve buried or sealed over	Unlocatable valve, unable to isolate network or customers.
	Valve sleeve filled with spoil or collapsed	Unlocatable valve, unable to isolate network or customers.

5.3.3 Type issues

With most network valves being installed underground, only accessible by the lid, spindle, and sleeve, we evaluate the performance of this asset type by conducting condition assessment driven by defect rates, with a particular focus on leakage and inoperability.

The overall condition of the valves is generally satisfactory, and they continue to fulfil their operational requirements effectively. We continue to apply ongoing monitoring and maintenance, which is essential to ensuring the continued performance of the valves. Regular inspections and assessments will allow us to identify any emerging issues or potential risks.

A summary of the overall VAL asset condition is shown in Table 5.26, classified by grades and pressure regime. A detailed table with the condition of all our assets is part of Schedule 12a.

Table 5.26: VAL asset condition

Asset type	Quantity	Grade 1	Grade 2	Grade 3	Grade 4	Grade unknown	Data accuracy
IP valves	1,495	0.53%	0.03%	45.02%	10.20%	44.22%	3
MP valves	3,167	0.03%	0.02%	41.48%	15.36%	43.11%	3
LP valves	107	0.00%	0.42%	29.84%	12.13%	57.62%	3
Total	4,769	0.19%	0.16%	38.78%	12.56%	48.32%	3

We have a strong focus on isolation valves, in line with our 2022 AMP update Pressure Isolation Upgrades disclosure.

A systematic issue detected in this asset class is leakage through the valve’s stem and glands. This common issue is identified through site visits and is addressed by routine maintenance (greasing and overhauling).

Asset information

We have been working on increasing the quality of our valve data with special focus on safety isolation and sectorisation. Ensuring data accuracy and completeness helps support the decision-making process across maintenance and renewal plans.

Early in 2023, we developed new underground valve tagging instructions, which facilitate field tagging installation while validating frontline information across our Asset Management System. This process is helping us keep GIS and SAP up-to-date with field validated data.

Table 5.27 shows some of the valve data characteristics we have been working on.

Table 5.27: Valves asset information

Improvement	Issue	Reason
Category (main or service)	Accuracy	Required to ensure correct network and customer isolations.
Valve material	Completeness	Required for maintenance and renewal planning.
Direction to close	Completeness and accuracy	Required for safe operation during emergency and fault response.
Turns to close	Completeness and accuracy	Required for safe operation during emergency and fault response.
Sectorisation	Accuracy	Required to support emergency plans and network optimisation.
Tagging	Completeness and accuracy	Required to ensure unique identification to each of our assets in the field and in our management systems.

5.3.4 Design and construct

The anticipated lifespan of VALs is determined by the Commerce Commission and can be found in Table 5.28.

Table 5.28: Life expectancy of VALs

Material	Sub material/pressure	Expected life (years)
Steel valve	All IP	60 to 70
	All MP and below	50 to 60
PE valve	All IP	60 to 70
	All MP and below	50 to 60

In line with national regulatory and statutory obligations, our engineering design and construction standards establish all the requirements for safety, quality and reliability of our valves. These standards and specifications are constantly evolving to incorporate new proven technologies available in the market. Our focus on quality in design and construction ensures we can meet and exceed the expected lifecycle.

5.3.5 Renewal

Valve renewal for main and service pipes is determined by the performance of the assets. Our approach is to proactively replace valves that are essential for isolating and sectorising the network. As for the other valves, we schedule renewals either when they fail or in conjunction with planned renewals of the pipelines they are connected to.

In FY23, we installed a new isolation valve on the mainline branch of the New Plymouth IP network.

In 2019, the original scoped timeframe was that by 2025 we would have completed the replacement of 18 valves in Hawke’s Bay, Porirua, and Belmont at an estimated delivery rate of 4-5 valves each year. However, progress to date shows only 1-2 valves can be installed yearly, and as a result it is anticipated that the completion of this work could extend into the early 2030s.

Our efforts to identify and install sectorisation valves as part of our network optimisation process have a direct impact on the deferral of overall valve renewals by reducing the number of valves that are required to safely operate the networks.

5.3.6 Operate and maintain

All valves undergo an annual inspection to ensure their proper functioning and adherence to safety standards. During these inspections, we focus on several key aspects, including:

- Checking for any gas leaks in and around the valves.
- Assessing the condition of valve lids to ensure they do not pose a risk to the public.
- Verifying the accessibility and clear visibility of the valves.
- Ensuring that valve identification labels are present and legible.
- Testing the valves' ability to operate halfway.
- Examining the sleeves for any obstructions or spoilage.
- Evaluating the corrosion levels to ensure they are within acceptable limits.

If a valve is found to pose a risk to public safety, we schedule immediate maintenance to address the issue. For other identified defects, we assess each case individually to determine whether replacement, refurbishment, or permanent decommissioning is the most appropriate course of action.

We have carried out improvements to our inspection question set to include on-site valve tagging and validation, allowing our field resources to install and update missing tags while synchronising field status across SAP and GIS.

5.3.7 Dispose

Disposing of VALs is a rare occurrence on our network because of the high cost involved in their removal. Instead, when a valve is no longer needed, our preferred approach is to decommission it by securely wrapping it and burying it underground. This decommissioning process is documented in our records, marking the valve as out of service.

In certain situations where a valve has an irreparable leak or requires replacement, we will remove the valve and replace it with a section of pipe. Once the valve is removed, it is also taken off our asset records.

The physical disposal of these valves is handled by our trusted service provider, who ensures compliance with all environmental regulations and requirements throughout the disposal process.

5.3.8 Expenditure

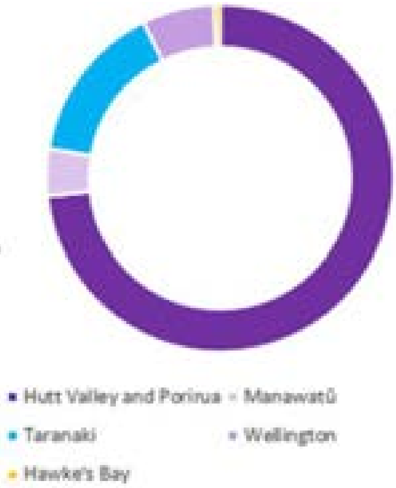
Figure 5.14 shows the expenditure programme across our VAL assets, with 33 projects forecast during the planning period, and an expected $3.71 million of investment across capital and complex operational expenditure on our networks. Of the 33 planned projects, 16 are in our 2024 GWP (next 12 months), combining for a total of $1.54 million in FY24. These figures are derived from our TPK Issues Register and represent our 10-year forward programme. Note, some projects are in our TPK, adding to our project count but are yet to have a price set. The figures stated are accurate up to July 2023.

Figure 5.14: VAL expenditure programme

Investment programme
(Opex + Capex)
$3.71m

Projects in the pipeline
33

Regional expenditure forecast



GWP 2024
Number of projects:
16
Forecast expenditure
(Opex + Capex):
$1.54m

Table 5.29 contains the 16 VAL projects in the 2024 GWP (next 12 months), ordered with the highest expenditure forecasts at the top. The other projects in the pipeline can be found in section 8 Expenditure Plan Summary and Maps, set out by region.

Table 5.29: GWP24 VAL projects

Project description	Project region	Expenditure category	GWP24 design/ construct	Description of works
Belmont HIP corroded isolation valves	HVP	Capex	Construct	Two valves at Belmont Gas Gate are badly corroded and need to be replaced to ensure safe delivery of gas into the future.
IP isolation valve – Jamaica Drive	HVP	Capex	Design	Part of our emergency IP isolation strategy. Protects 1,000 customers up to 1,500m downstream.
IP isolation valve - Eastern Hutt Road	HVP	Capex	Design	Emergency isolation valve protecting 13,549 customers.
Avalon Stopbank LIP leaking isolation valve renewal	HVP	Capex	Design	Leaking isolation valve causing safety hazard to public.
IP isolation valve - Omapere Street Cocon	HVP	Capex	Construct	Provides the ability to isolate the flow of gas into the Cocon, improving the reliability of the regulator’s performance.
LIP valve renewal – Cutfield Road	TAR	Capex	Design	Replacement of seized 100NB LIP valve that protects 1.5km and 3,000 customers.

Project description	**Project region**	**Expenditure category**	**GWP24 design/ construct**	**Description of works**
IP isolation valve – Karamu Road	HAB	Capex	Design	Installation of new valve for IP isolation that will protect 7,819 customers and supply to Hastings.
Palmerston North LMP sector valves	MAN	Capex	Design	Sectorisation of Palmerston North MP containing 14,000 ICPs. Will involve the installation of 10 poly valves and three end caps to improve safety in case of an emergency.
IP valve replacement – High Street	HVP	Capex	Design	Valve was found to be leaking at threaded end caps. To be replaced with spool to ensure reliable delivery of gas into the future.
New Plymouth south sector valves	TAR	Capex	Construct	Nine valves to be installed to sectorise New Plymouth to fewer than 5,000 ICPs per sector as per Powerco standards.
LIP valve renewal - Warspite Avenue	HVP	Capex	Construct	Replacement of a leaking LIP valve with the aim to improve safety in the area.
Foxton Gate Station fire valve	MAN	Opex	Design	Renew valve being used for decommissioned street regulator outside Foxton Gas Gate.
Lower Hutt east sector valves	HVP	Capex	Design	Installation of four valves to sectorise Lower Hutt East.
Napier LMP sectorisation	HAB	Capex	Design	Installation of three poly valves to create a 700-customer sector and allow delivery of gas through Pandora DRS alone at ~75% demand.
Lower Hutt north sector valves	HVP	Capex	Design	Installation of two valves to sectorise Lower Hutt north.
IP Isolation valve – Wynyard Street DRS	TAR	Capex	Construct	Installation of emergency isolation valve protecting more than 7,000 customers as part of our sectorisation strategy.

5.4 Special crossings (SPX)

Special crossings (SPX) are utilised when a pipeline needs to cross rivers, railways, or motorways, either above or below ground level. Above ground crossings are attached to support structures, such as a bridge or culvert, and below ground level crossings are buried as a cased pipeline or inside a utility corridor. This asset class accounts for 0.21% of our total RAB value.

The types of SPX we use on our network can be seen in Table 5.30.

Table 5.30: Description of SPX types

Type	**Description**
Attached	Fixed to a support structure using brackets, can be cased or uncased.
Below ground	A cased pipeline buried beneath a crossed feature.
Utility corridor	A passage within a support structure, specifically designed for carrying uncased pipelines.

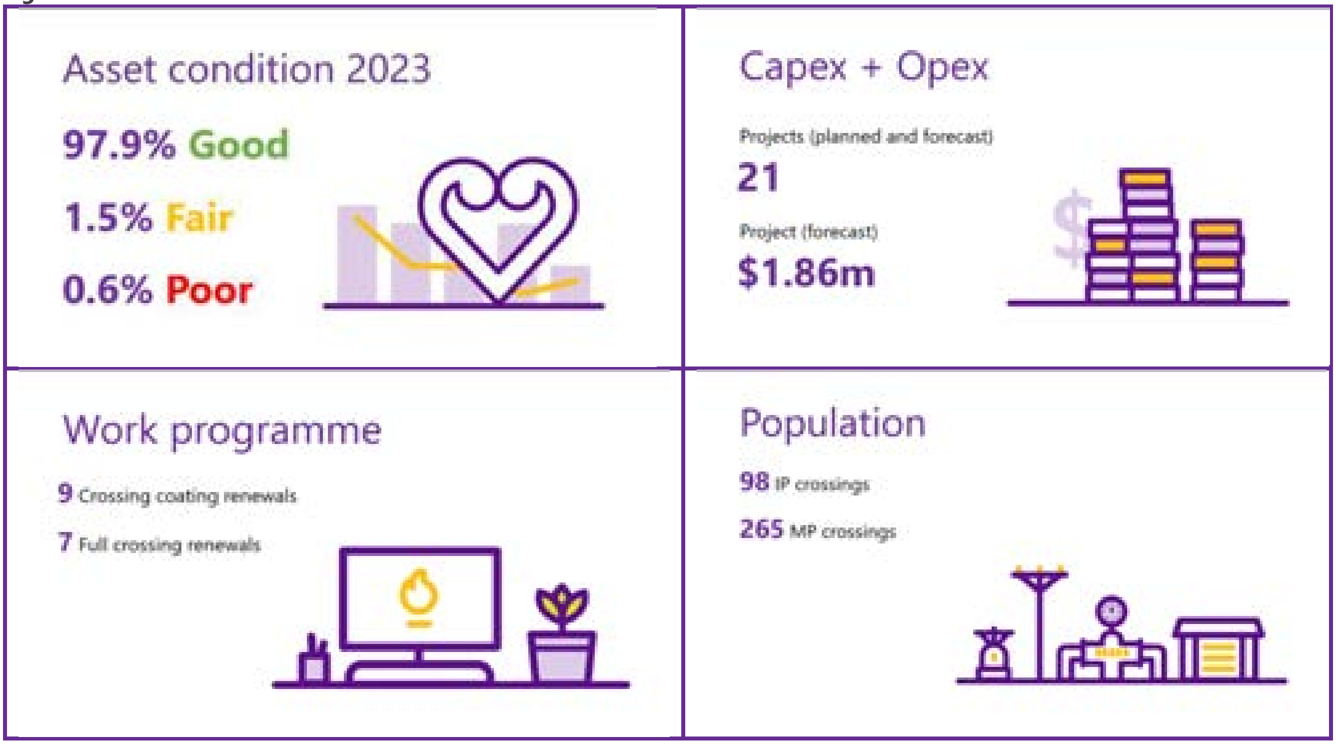
Asset class dashboard

Figure 5.15 corresponds to the SPX asset class dashboard, highlighting:

- Asset condition 2023 is reflective of Schedule 12a, and the grading system categories defined in Table 5.2.
- $1.86 million of capital and operational investments spread across 21 planned and forecast activities.
- Operational investments are defined as being complex in nature, requiring detailed planning and project management oversight.
- The work programme consists of nine coating renewals and seven full crossing renewals.

- A population of 98 crossings on our IP network and 265 crossings on our MP network.

Figure 5.15: SPX asset class dashboard



5.4.1 Asset class objectives

Contributing towards the delivery of a better energy future to our customers by providing a consistently safe, reliable, resilient, and cost-effective gas network now and into the future, the primary objectives for SPX are:

- To convey gas across our networks, from the gate points to our customers.
- To protect main and service pipes against deterioration when crossing a river, railway, or motorway.
- To efficiently reduce the total number of unplanned gas releases and outages resulting from asset failure.
- To reduce public safety risks.
- To maintain a high visual appearance standard.

Powerco’s special crossings are secondary systems, meaning their primary function is to ensure their protected assets (gas pipe) meet their primary objectives.

The primary risks associated with our SPX assets are TPI, component failure, and asset failure because of incorrect maintenance and operation.

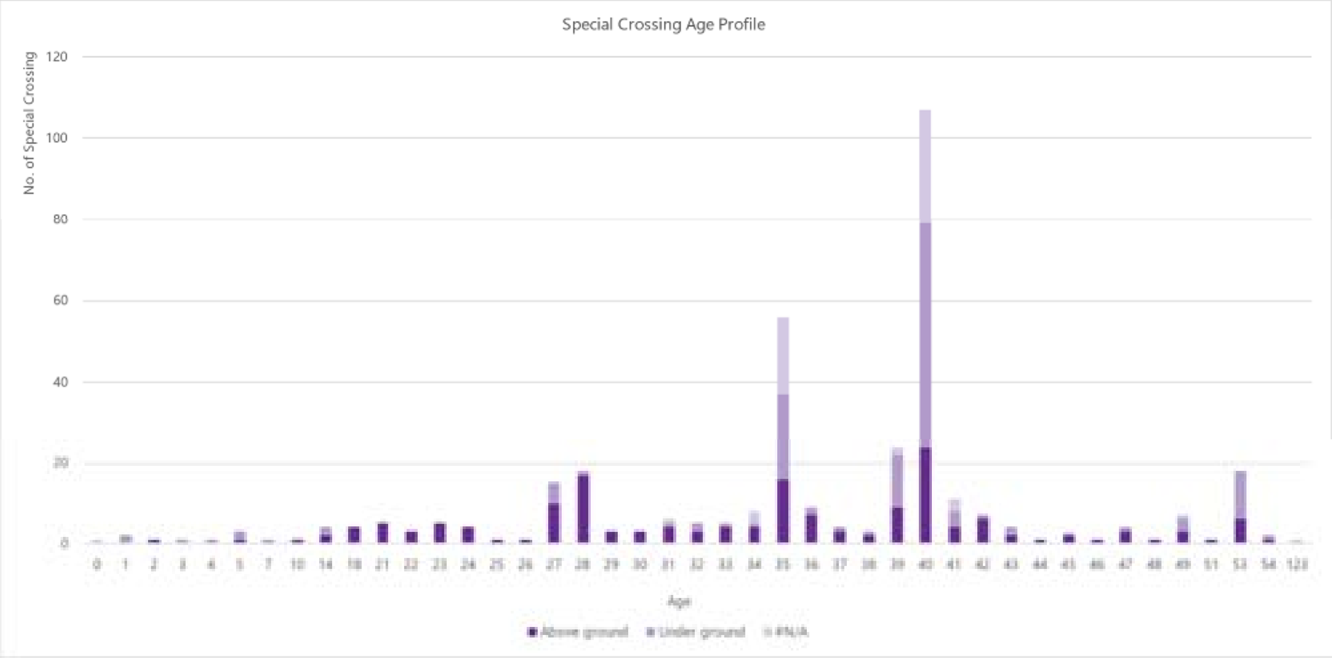
5.4.2 Asset class overview

The types of SPX we operate, and the associated pressure and service status, are broken down in Table 5.31. The overall health of our assets is shown through the age of the assets, which corresponds to the expected lives set by the Commerce Commission. The expected lives are based upon the pipeline contained within the asset. Figure 5.16 shows the age profile of our SPX.

Table 5.31: Total number by pressure, type and status

Pressure	Type	Total	In service	Average age (years)[20]
IP	Total	99	99	38
	Above ground	28	28	40
	Below ground	60	60	37
	Blank	11	11	40
MP	Total	266	265	35
	Above ground	140	139	33
	Below ground	77	77	38
	Blank	49	49	39
All pressure	Total	365	364	36

Figure 5.16: SPX age profile



5.4.3 Type issues

The major risks associated with SPX are outlined in Table 5.32. Our strategy and engineering standards are designed to minimise these risks to as low as reasonably practicable. Additionally, we provide clear instructions for making process adjustments in the field when these risks are identified. By proactively addressing the risks, we aim to enhance public safety and ensure the reliability of our SPX while continuously improving our operational practices.

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[20] In-service crossings only

Table 5.32: Key SPX risks

Major threat	Specific threats	Consequence
Legacy construction and design	Crossing depth too shallow	Scouring or erosion of the riverbed exposing crossing to water.
Supporting structure defects/failure	Bridge movement	Increased stress or fatigue applied to crossing, leading to leakage or failure.
	Vibration	Bracket fixings become loose increasing stress or fatigue applied to crossing, leading to leakage or failure.
Material/component failure	Flexible joint	Bridge movement causing flexible joints to fail, leading to leakage or failure.
	Seal failure	Water or material ingress causing corrosion, leading to leakage or failure.
Third-party damage	Vehicle impact (above ground)	Third party damaging asset or protective coating, leading to leakage or failure.
	Vandalism (above ground)	Third party damaging asset or protective coating, leading to leakage or failure.
	Working without notification	Third party damaging asset or protective coating, leading to leakage or failure.

The performance of our SPX is monitored through leakage surveys, maintenance inspections, and safety assessments on a case-by-case basis.

Corroded casing and supports, and incorrect clamps are the common systematic issues found through our inspections. These are addressed and evaluated through our defect management process and resolved through planned corrective maintenance and project delivery initiatives. We have not identified any systematic type issues associated with our SPX.

Table 5.33 demonstrates the condition of our SPX assets, categorised by pressure. It is an excerpt from Schedule 12a, which details the condition of all assets.

Table 5.33: Asset condition of SPX

Asset type	Quantity	Grade 1	Grade 2	Grade 3	Grade 4	Grade unknown	Data accuracy
IP crossings	99	0.00%	0.61%	95.54%	3.85%	0.00%	3
MP crossings	265	0.75%	1.87%	94.66%	2.71%	0.00%	3
Total	364	0.38%	1.24%	95.10%	3.28%	0.00%	3

Asset information

The asset information we have for our SPX is sufficient for our planning purposes. Currently, we have no plans to specifically gather further information on our SPX other than through usual inspection cycles and site inspections.

5.4.4 Design and construct

Powerco standards state the criteria that SPX on our network must comply with. These differ with respect to the SPX location, whether it be above or below the ground, and the type of feature it is crossing over or under.

Resource consent must be obtained, and the standards cover the typical depth, pressure testing and casing required for each crossing type. A SPX life expectancy is designed to match the life of their protected asset.

Table 5.34 shows the established life expectancy for SPX set by the Commerce Commission.

Table 5.34: Life expectancy of SPX

Material	Expected life (years)
IP crossings	60 to 70
MP crossings	50 to 60
LP crossings	50 to 60

Earlier this year, Cyclone Gabrielle caused a significant flooding event in Hawke’s Bay. Our above ground SPX across the Ngaruroro River bridge in Napier sustained damage when it was pulled from its brackets because of the flooding and slash in the river. The crossing, which was built in the 1960s, was built on the upstream side of the bridge because of the perceived high risk of tsunamis at the time. However, this meant it was more susceptible to flooding than if it were downstream. The increased flood risk during the past 60 years has motivated Powerco to update the FMEA and asset class strategy for SPX in RY24, as well as our adaptation resilience plan, as set out in Chapter 2. These learnings are now reflected in our design and construction standard for any new future SPX installation.

5.4.5 Renewal

Renewal planning is undertaken proactively on SPX, driven by:

- Maintenance and inspection results.
- Safety assessments.
- Bridge renewals (above ground only).
- Options analysis.
- Erosion or riverbed exposing crossing.
- End of asset life.
- Volume to Value Strategy.

When defects can no longer be remedied through corrective maintenance or the asset presents a public safety risk, renewal projects are planned. Details for expenditure on our SPX are included in section 5.4.8.

Since the last AMP, we have not implemented any innovations that have deferred the replacement of our SPX assets.

5.4.6 Operate and maintain

SPX are inspected on a quarterly and annual basis, depending on the location of the crossing being above or below ground. Table 5.35 shows the type and frequency of inspections for the different types of crossing. Table 5.36 describes the objectives and main activities of each maintenance inspection. Above ground crossings are more exposed to the external environment, requiring more frequent inspections.

Table 5.35: Operation and maintenance schedule for SPX

Crossing type	Quarterly	Annually	5 years	15 years
Above ground	Leakage survey Signage Visual integrity	Movement and stability		Comprehensive integrity
Below ground		Leakage survey Signage Visual integrity	Comprehensive integrity	

Table 5.36: SPX specific inspection types

Type	Description
Leakage survey	Gas detection over the crossing span plus 20 metres either side.
Signage	Crossing identified through clearly visible and accurate signage.
Movement and stability	Assessment of abutment movement, bank stability and expansion joint integrity.
Visual integrity	Visual assessment of the coating, support, and surrounding environment integrity.
Comprehensive integrity	Above ground – Full inspection of crossing, coating, brackets, and fixings. Below ground – Inspection of vent pipework and pressure test of casing (if required).

If we observe corrosion on pipe supports (for bridge crossings) or carrier pipe, this is dealt with within a year of its discovery through our amber defect process.

5.4.7 Dispose

As with the inspection schedules, SPX disposals are treated separately if they are above or below ground.

Above ground crossing disposals are much like regulator stations, our preference is the full removal of the crossing including related equipment (e.g. brackets) and the restoration of the site to pre-installation condition. If not removed, the site will require ongoing maintenance and monitoring, which incurs additional operational expenditure. Physical disposal of this asset is completed in compliance with all environmental requirements by our service provider.

Below ground crossing disposals are treated the same as mains and services, our preference being to decommission the asset and leave it in the ground, while recording it as out of service in our records. Different to mains and services, the vent-up stands are removed to below ground level and the vent ends are permanently sealed to eliminate risk in future.

5.4.8 Expenditure

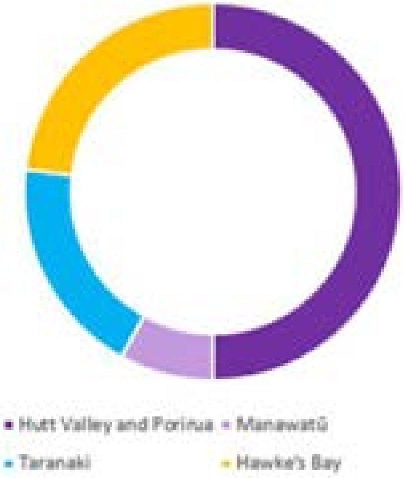
Figure 5.17 shows the expenditure programme across our SPX assets, with 21 projects forecast during the planning period, and an expected $1.86 million of investment across capital and complex operational expenditure on our networks. Of the 62 planned projects, seven are in our 2024 GWP (next 12 months), combining for a total of $1.24 million in FY24. These figures are derived from our TPK (Issues Register) and represent our 10-year forward programme. Note, some projects are in our TPK, adding to our project count but are yet to have a price set.

Figure 5.17: SPX expenditure programme

Investment programme
(Opex + Capex)
$1.86m

Projects in the pipeline
21

Regional expenditure forecast



GWP 2024
Number of projects:
7

Forecast expenditure (Opex + Capex):
$1.24m

Table 5.37 contains the seven special crossing projects in the 2024 GWP (next 12 months), ordered with the highest expenditure forecasts at the top. The other projects in the pipeline can be found in section 8 Expenditure Plan Summary and Maps, set out by region.

Table 5.37: GWP24 SPX projects

Project description	Project region	Expenditure category	GWP24 design/ construct	Description of works
Ngaruroro River bridge bracket replacement	HAB	Capex	Construct	Significant movement on the protected IP pipes on the bridge causes damage to the pipeline coating and instigates unwanted maintenance on the crossing. This crossing protects the IP pipe that feeds all of Hastings and Havelock North, making this job of high priority.
Whites Line East MP special crossing	HVP	Capex	Construct	The Whites Line East steel river crossing has experienced significant corrosion, causing separation at one end and imposing stress on the PE main pipe. Replacing the steel casing will serve to protect the main and improve safety in the delivery of gas across the bridge.
Waione Bridge corrosion and bracket replacement	HVP	Capex	Construct	Several corrosion defects have been recorded along the length of the bridge, but they are concentrated around brackets. This crossing is the sole feed from Riddlers Crescent DRS and is critical to the reliability of supply to the rest of the Hutt Valley network.
South Beach Road crossing missing vent pipes	HVP	Capex	Construct	Strategic rail crossing for LMP main in Plimmerton has no vent pipes at either end of the crossing. Issues with the rail crossing could lead to a major delivery restriction throughout Plimmerton.
Cardiff Bridge rail crossing renewal	TAR	Capex	Construct	A temporary non-standard design was installed to repair a leak stemming from a weld in 2022. A full renewal of the crossing is planned for this year.

Project description	**Project region**	**Expenditure category**	**GWP24 design/ construct**	**Description of works**
Karamu Stream IP crossing	HAB	Opex	Construct	The coating and brackets on the IP river crossing have been damaged from debris at a time of high flow. Repair will include full coating removal and repaint to ensure the delivery of gas into Hastings is maintained.
Pomare Bridge inspection procedure	HVP	Opex	Construct	Generate procedure to inspect this bridge crossing as per WP report.

5.5 Monitoring and control systems (MCS)

Monitoring and control systems (MCS) are a key part of our network infrastructure. The information they provide is a fundamental part of our network improvement initiatives and operation. Currently, Powerco is not using any control functions, meaning our system is used for real-time monitoring only. Table 5.38 shows the types of MCS used on our network.

Table 5.38: Description of Powerco's MCS types

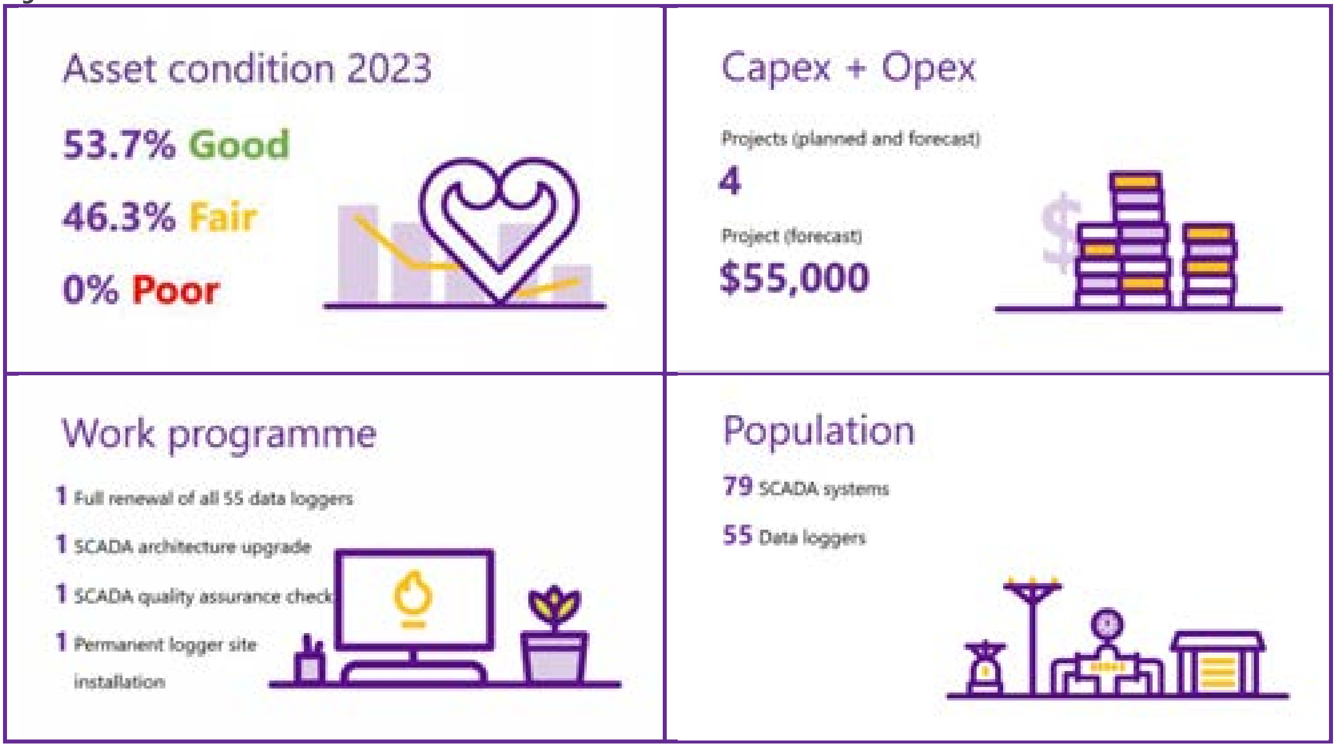
Type	**Description**
SCADA	Permanent sites, providing live data and alarms primarily used for monitoring regulator stations.
Data loggers	Self-contained units, recording and providing delayed data and live alarms, used on regulator stations and network monitoring points.

Asset class dashboard

Figure 5.18 corresponds to the MCS asset class dashboard, highlighting:

- Asset condition 2023 is reflective of Schedule 12a, and the grading system categories defined in Table 5.2.
- $55,000 of capital and operational investments spread across four planned and forecast activities.
- Operational investments are defined as being complex in nature, requiring detailed planning and project management oversight.
- The work programme comprises full renewal of all data loggers and an upgrade to our SCADA architecture, a SCADA quality assurance check, and the installation of a permanent logger site.
- A population of 79 SCADA systems and 55 data loggers.

Figure 5.18: MCS asset class dashboard



Asset condition 2023

53.7% Good

46.3% Fair

0% Poor

Capex + Opex

Projects (planned and forecast)

4

Project (forecast)

$55,000

Work programme

1 Full renewal of all 55 data loggers

1 SCADA architecture upgrade

1 SCADA quality assurance check

1 Permanent logger site installation

Population

79 SCADA systems

55 Data loggers

5.5.1 Asset class objectives

Contributing towards the delivery of a better energy future to our customers by providing a consistently safe, reliable, resilient, and cost-effective gas network now and into the future, the primary objectives for MCS are:

- To monitor, gather, and process real-time data on our networks.
- To alert Powerco on network behaviours and/or potential failures in the network.

As a secondary system, SCADA plays a crucial role in ensuring that the assets monitored continue to fulfil their primary objectives and work within their operating envelope. After analysing asset risks, we have identified the primary causes of failures in MCS are TPI, failures in supporting systems, and delays in response times because of incorrect maintenance and operation practices.

Our focus for this asset class centres on ensuring the correct configuration, and to conduct investigations, when required, to address any component replacement. By addressing configuration concerns and exploring potential system replacements, we aim to enhance the performance and reliability of our MCS, reducing the risks associated with failures and ensuring the efficient operation of our assets.

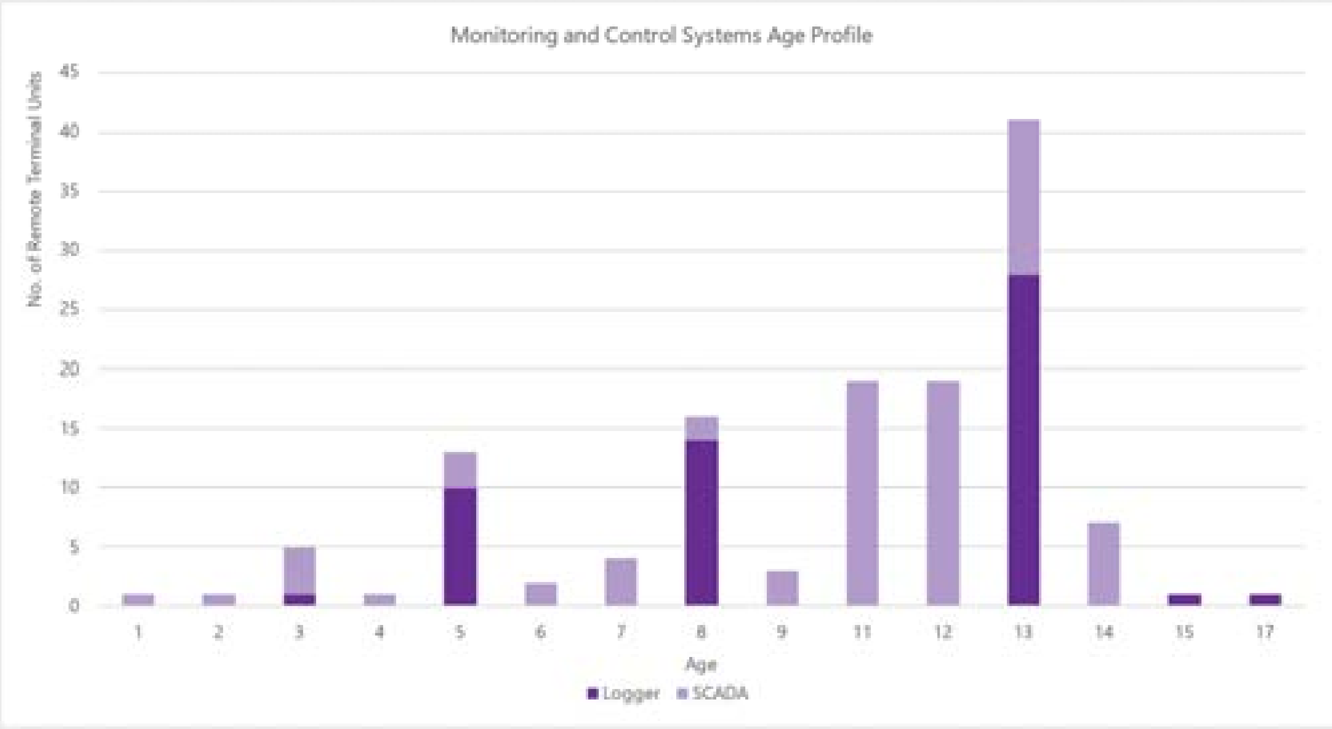
5.5.2 Asset class overview

Table 5.39 shows the population breakdown of our MCS. The breakdown is split up by quantity, service status, and average age, which indicates the health of the assets. Figure 5.19 shows the age profile by type.

Table 5.39: MCS numbers by pressure type and status

Type	Total	In service	Average age (years)[21]
SCADA	81	79	10
Data loggers	55	55	10
Total	136	134	10

Figure 5.19: MCS age profile



5.5.3 Type issues

The major risks for our MCS are shown in Table 5.40. Most of the risks associated with our MCS are electrical and third-party damage related. Our asset class strategy for MCS is due to be updated during the next AMP cycle. It will be used to drive changes within our standards and identify projects to minimise or eliminate the risks from occurring and to instruct process adjustments for when they are identified in the field.

Table 5.40: Key MCS risks

Major threat	Specific threats	Consequence
Alarm configuration	Incorrect alarm levels	Alarms set at wrong level, increasing likelihood of over/under pressure being missed.
	Spurious alarms	Decreased likelihood of responding to correct alarm.
Insufficient response time	Missed alarms	Duty operator misses alarm, increased likelihood of unplanned outage of gas exposure event.
Component failure	Battery failure	Battery fails, MCS not operating when alarm required.

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[21] In-service systems only

Major threat	Specific threats	Consequence
	RTU or data logger failure	Primary unit fails, MCS not operating when alarm required.
Supporting systems	IT server failure	Server hosting MCS software fails, increased likelihood of missing alarms.
	Telecommunication system failure	Telecommunications network fails, increased likelihood of missing alarms.
	Electrical system failure	Electrical system fails, MCS not operating when alarm required.
Third-party damage	Vehicle impact	Third-party damage on asset, MCS not operating when alarm required.
	Vandalism	Third-party interference on asset, MCS not operating when alarm required.

Table 5.41 shows the condition of our MCS as per Schedule 12a in Appendix 3. Other than age degradation, no systematic issues have been found in this asset class.

Table 5.41: MCS asset condition

Asset type	Quantity	Grade 1	Grade 2	Grade 3	Grade 4	Grade unknown	Data accuracy
MCS	134	0.00%	46.27%	41.06%	12.69%	0.00%	4

Asset information

The quality of our asset information for MCS is of a high standard, attributed to the accessibility of the assets, availability of live data and alarms, and the age of our assets. We consistently gather all the necessary information through regular maintenance activities and thorough inspections. This ensures that we have comprehensive and up-to-date data to effectively monitor and control our systems. By maintaining a high standard of asset information, we can make informed decisions, optimise performance, and promptly address any issues that may arise.

5.5.4 Design and construct

The Commerce Commission sets an expected life of 20 years for MCS. Powerco’s Gas division is in the process of scoping a full system and technology upgrade for our SCADA systems, with the aim to bring a contemporary approach to how we gather and analyse real-time data to monitor and control equipment that deals with critical and time-sensitive materials and/or events on our networks.

We are also undertaking a review of our Gas Operations SCADA Standard to include learnings and to future proof this technology.

5.5.5 Renewal

The requirements for MCS are derived from the network strategies outlined in Chapter 7. Specifically, the Network Resilience and Redundancy Strategy serves as the primary catalyst for the installation and renewal of SCADA systems on regulator stations. Additionally, the Pressure Droop Strategy guides the placement of data loggers on network extremities. Both the Pressure Droop Strategy and Elevated Pressure Strategy play a crucial role in determining the alarm limit setpoints for SCADA and data loggers. By aligning with these strategies, we ensure that our MCS are strategically implemented to enhance network resilience, redundancy, and maintain optimal pressure management throughout the network.

Regularly, Powerco’s preference is to run the MCS assets to failure. Asset obsolescence drives larger programmes of work, and the criticality of the monitored asset will drive renewal prioritisation. However, the 2G telecommunications transmitting network that our pressure loggers use to transmit data will no longer be supported after FY23-24, meaning our fleet of loggers will become obsolete after this time. Therefore, this financial year we are looking to test a range of 4G-based loggers, then in FY24 we will look to complete a slow roll-out of our new generation of loggers onto our network.

5.5.6 Operate and maintain

Powerco's MCS are totally autonomous, and all data is transmitted through the 2G telecommunications network. Operation and maintenance activities are driven by alarms and routine inspections. The inlet and outlet pressures, flow rates, and alarm activations at the regulator station at which the system is installed can be accessed online using a remote user access system. The data is used in the Asset Strategy team's network analysis and monthly reporting.

Our SCADA systems are inspected annually, in alignment with our Gas Operations SCADA Standard, which involves a generic inspection, a solar power inspection (where installed), a meter check, an inspection of the transmitter and RTU, and the recording of any defects. This inspection period meets the manufacturer's instructions and the requirements of national standards, and ensures the assets maintain the condition and operability to meet the asset's important operational design life.

5.5.7 Dispose

At Powerco, our preferred method of disposing of a SCADA system is to fully remove the cabinet and any related equipment, and to restore the site to its condition before installation. Any system causes a health and safety risk to the public if not removed, and requires ongoing maintenance and monitoring, incurring additional operational spending. The cables and wires must be disconnected by an electrician, as live wires pose a major health hazard around gas assets. All systems are then assessed for suitability for refurbishment and subsequent reuse. If they are found to be unsuitable, our service provider disposes of the physical asset in compliance with all environmental requirements.

5.5.8 Expenditure

Figure 5.20 shows the expenditure programme across our MCS, with four projects forecast during the planning period, and an expected $55,000 of investment across capital and complex operational expenditure on our networks. Of the four planned projects, one is in our 2024 GWP (next 12 months), with a forecast expenditure of $28,000 in FY24. These figures are derived from our TPK (Issues Register) and represent our 10-year forward programme. Note, some projects are in our TPK, adding to our project count but are yet to have a price set

Figure 5.20: MCS expenditure programme

Investment programme
(Opex + Capex)
$55,000

Projects in the pipeline
4

Regional expenditure forecast

GWP 2024
Number of projects:
1

Forecast expenditure (Capex):
$28,000

Table 5.42 shows the single MCS project in the 2024 GWP (next 12 months).

Table 5.42: GWP24 MCS project

Project description	Project region	Expenditure category	GWP24 design/ construct	Description of works
New data logger purchase	All regions	Capex	Design	Our current fleet of loggers operate using the 2G cellular network, which One NZ is decommissioning in 2025. Therefore, a replacement of our full fleet of loggers will be required to be able to model our networks accurately in the future.

5.6 Cathodic protection systems (CPS)

Cathodic protection systems (CPS) play a crucial role in safeguarding our buried metallic assets on the network, and help to maintain and monitor their condition. These systems serve as a secondary layer of protection when the primary protective coating on an asset deteriorates or fails. The different types of CPS employed on our network are outlined in Table 5.43.

Table 5.43: Description of Powerco's CPS

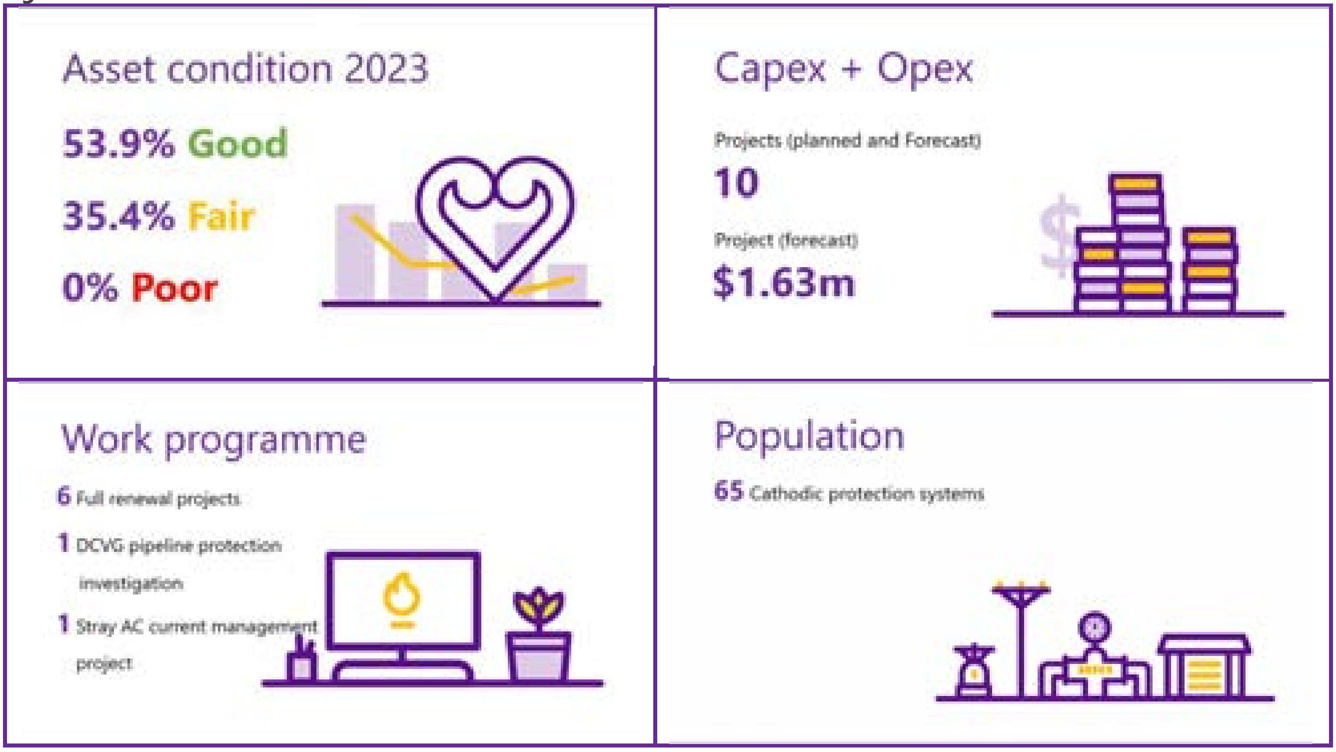
Type	Description
Galvanic system	Asset is protected by being cathodically charged through the passive electronegativity difference between the sacrificial anode and the asset.
Impressed current system	A galvanic system with additional negative charge impressed onto the protected asset. This charge increases cathodic protection by opposing corrosion charge pathways.

Asset class dashboard

Figure 5.21 correspond to the CPS asset class dashboard, highlighting:

- Asset condition 2023 is reflective of Schedule 12a, and the grading system categories defined in Table 5.2.
- $1.63 million of capital and operational investments spread across ten planned and forecast activities.
- Operational investments are defined as being complex in nature, requiring detailed planning and project management oversight.
- A work programme that comprises 6 full cathodic protection system renewal projects, 1 direct current voltage gradient pipeline protection investigation, and 1 stray AC current management project.
- A population of 65 cathodic protection systems installed across our steel networks.

Figure 5.21: CPS asset class dashboard



5.6.1 Asset class objectives

Contributing towards the delivery of a better energy future to our customers by providing a consistently safe, reliable, resilient, and cost-effective gas network now and into the future, the primary objective for CPS is to protect metal against degradation.

Cathodic protection acts as an added barrier (secondary system) in addition to any existing coating or any other primary barrier. We have conducted a comprehensive analysis of asset risks and identified the primary causes of cathodic protection failure are TPI, external interference, and asset failure resulting from incorrect maintenance and operation.

Currently, our focus is on enhancing the performance of CPS, particularly for our IP pressure systems, through the delivery of our CPS upgrade and renewal programme. This programme was developed under three strategic targets:

- Reliability – IP and selected MP systems continue to provide safe containment of gas.
- Safety – Public and worker safety is maintained.
- Delivery – Build IP pipeline resilience reducing the likelihood of supply curtailment, or interruption as result of corrosion-based leakage.

5.6.2 Asset class overview

A description of our CPS, including the quantity, service status, and average age of each type is shown in Table 5.44. Figure 5.22 shows the age profile of our cathodic protection assets.

By analysing performance details of periodic readings, we can assess the effectiveness and performance of our CPS. This allows us to gain valuable insights into the state of our assets and make informed decisions regarding their maintenance and improvement.

Table 5.44: CPS total number by type and status

Type	Total	In service	Average age (years)[22]
Impressed current	11	11	31
Galvanic	51	47	28
Total	66	58	29

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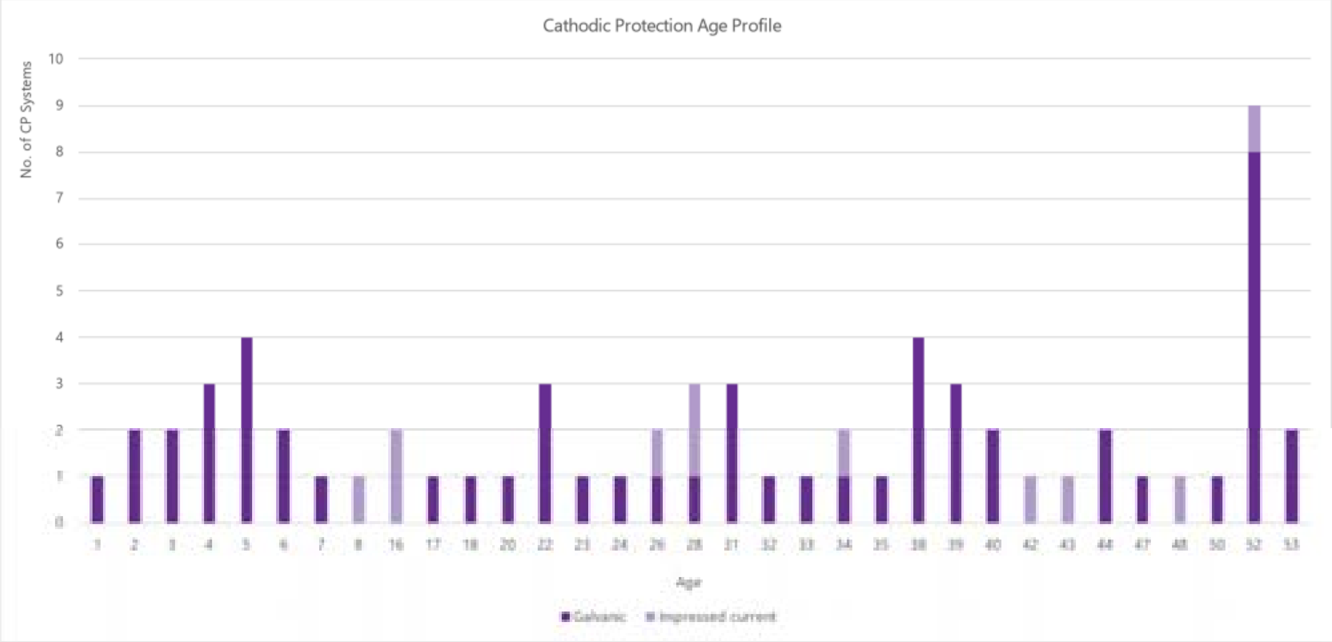
[22] In-service systems only

Figure 5.22: Cathodic protection age profile



5.6.3 Type issues

Table 5.45 shows the primary risks associated with our cathodic protection assets.

In line with our asset class strategies, we are actively working towards minimising or eliminating these risks through our CPS upgrade and renewal programme. This is designed to improve the system protecting the approximately 410km of in-service steel pipe from corrosion damage. Our aim is to ensure the optimal performance and reliability of our CPS.

Table 5.45: Key CPS risks

Major threat	Specific threats	Consequence
Incorrect design or construction	Incorrect asset protected	Unintentional protection of another asset, creating an unplanned draw on the system. Failure or reduction in cathodic protection.
	System not extended for network growth	Steel assets installed without extending coverage of system. Assets unprotected.
Incorrect maintenance and operation	Anode fully degrades	Failure or reduction in cathodic protection.
	Live cable exposed	Increased risk to public safety.
Material/ component failure	Isolation joint or surge diverter failure	Unintentional protection of asset/s, creating an unplanned draw on the system. Reduction or failure of cathodic protection.
	Cable failure	Asset no longer receiving impressed current. Failure or reduction in cathodic protection.
External interference	External CPS	Disruption caused by external CPS. Failure or reduction in cathodic protection.
	Induced or stray current	Disruption caused by external CPS. Failure or reduction in cathodic protection.
Third-party damage or interference	Vehicle impact	Above ground assets damaged. Failure or reduction in cathodic protection.
	Test point buried or sealed over	Unable to test performance of cathodic protection. Failure or reduction of system not identified.

Major threat	Specific threats	Consequence
	Working without notification	Third party damaging component assets. Failure or reduction in cathodic protection.

Table 5.46 summarises the condition of CPS. A detailed table with the condition of all our assets is part of Schedule 12a.

Table 5.46: CPS asset condition

Asset type	Quantity	Grade 1	Grade 2	Grade 3	Grade 4	Grade unknown	Data accuracy
Cathodic protection	65	0.00%	35.38%	29.23%	24.62%	10.77%	3

Performance of our CPS is monitored on an ongoing basis. However, the overall performance can be impacted by some systematic issues, including:

- Damage or failure of the protected asset's intrinsic protection (e.g. coating or wrapping).
- Unintentional protection of assets external to the system, through design failure or failure of an insulation joint.
- Degradation of the protection anode.
- Damage to the rectifier.
- Stray or induced current on protected asset.

For several years, we have been conducting troubleshooting activities to identify the sources of undesirable electrical charges on and off the IP pipe. Through these efforts, we have discovered that faults can be attributed to assets belonging to other utility owners, which either introduce or drain the electrical charge from the pipe. Once a fault is identified, we promptly isolate and repair it. However, these investigations have been time-consuming.

To address this issue, we have reconfigured the layout of the CPS, which has resulted in improved charge readings.

We continue to face challenges in maintaining the charge within the desired range. We are actively working on identifying and implementing solutions to overcome these persistent problems and ensure the effective functioning of our CPS.

Asset information

An output of our CPS upgrade and renewal programme is re-configuration of the asset information within our Asset Management System. Table 5.47 shows key improvements we are looking for:

Table 5.47: CP asset information characteristics

Asset	Improvement	Issue	Reason
All assets	Location	Accuracy	Improved location information will assist with maintenance, inspections, and prevention of third-party damage.
CP anode	Type (galvanic or impressed)	Completeness	Required for defining the area of a CPS.
CP test point	Type	Completeness	Required for identification, improving maintenance and inspections.
CP bond wire	Bonded to	Accuracy	Required for defining the area of a CPS.

Asset	Improvement	Issue	Reason
CP test lead	Wire ID	Completeness	Required for identification, improving maintenance and inspections.

5.6.4 Design and construct

Our CPS are designed to comply with Powerco’s Gas Operations Cathodic Protection Standard.

The Commerce Commission sets an expected life of 35 years for CPS, irrespective of system type and its associated equipment.

We are in the process of connecting our CPS directly to SCADA, moving CP into continuous monitoring. This means our system will alert any condition changes that may impact its performance. This move will eliminate the need for routine checks, having a positive impact in our maintenance expenditure while safeguarding equipment reliability.

5.6.5 Renewal

Regarding individual assets with a CPS, Powerco's preferred approach is to allow them to run until they fail. We closely monitor their performance through regular operation and maintenance activities. However, when we reach a point where we can no longer maintain the CPS within its specified operating parameters, we plan for its renewal.

Apart from performance considerations, the construction or enhancement of CPS is also driven by other network projects. Specifically, when there are extensions to our IP mains, we install additional CP assets to ensure the proper protection of the expanded network. This proactive approach helps us maintain the integrity and reliability of our infrastructure in line with industry standards and best practice.

The CPS upgrade and renewal programme is progressing, with reprioritisation of projects within the programme to ensure that the CPS of the poorest performing steel pipes is replaced first. Table 5.48 shows the status of the programme by area.

Table 5.48: CP renewals and upgrades

Project name	Status
Wellington IP CP	Physically completed and capitalised
Upper Hutt IP CP	FY24 – Rollover to FY25
Lower Hutt IP CP	FY25
Porirua IP CP	Physically completed and capitalised
Levin MP CP	FY23 – Rollover to FY24
Palmerston North CP	Physically completed and capitalised
New Plymouth IP CP	FY26
Hāwera MP CP	FY27
Hastings IP CP	FY28

5.6.6 Operate and maintain

CPS requires little intervention from an operability and maintenance point of view.
The system is monitored by taking readings. These readings identify whether the system is working as required. The maintenance activities performed on CPS include checking joints, replacing anodes, and setting parameters for systems with impress current. These parameters can be changed throughout the asset life depending on conditions identified during inspections. These parameters are set to ensure that the ground's electric potential is above the pipe's electric potential.

During inspection, CP readings are taken, and all accessible physical equipment is checked for damage. The readings are the primary indication of faults in the system. The rectifiers and bonds on a CPS are considered to have a run-to-failure maintenance routine, while anodes are maintained on a condition-based maintenance routine.

The inspections and test results are analysed constantly, and actions taken accordantly.

5.6.7 Dispose

With CPS, Powerco chooses to fully decommission and remove the above ground components. These components include rectifiers, PCRs, test points, etc. Any above ground system that might not be removed will present a public risk needed to be managed, requiring ongoing cost associated with operations and maintenance.

For underground assets, such as isolation joints, cables, and anodes, decommissioning in-situ is preferred. All records are updated to reflect the out of service status.

All disposal works are completed by our service providers in compliance with our engineering and environmental standards.

5.6.8 Expenditure

An investment of $1.63 million on our CPS during the next five years is included in our forecast, and delivered under the CPS upgrade and renewal programme by our Projects team.

The general scope of the programme covers upgrade/renewal of nine CPS – five in the Wellington region, one in Manawatū and Horowhenua, two in Taranaki, and one in Hawke's Bay. It also includes the Wellington City CP. The programme distributes expenditure as follows:

Capex covers:

- Installation of new test points.
- Renewal of transformer rectifiers (TR) and anode beds.
- Upgrade of existing test points with IP67 test boxes.
- Installation of new transformer rectifiers and anode beds.
- Where required, relocation of TR and anode beds to improve system performance, worker safety and maintenance costs.
- Supply and installation of CP data loggers.
- Installation of surge diverter across flange insulation kit.
- Installation of replacement CP test points, where existing test points are replaced with new test points.

Opex covers:

- Production of operations manuals for each network.
- Validate CP cable connection, and label.

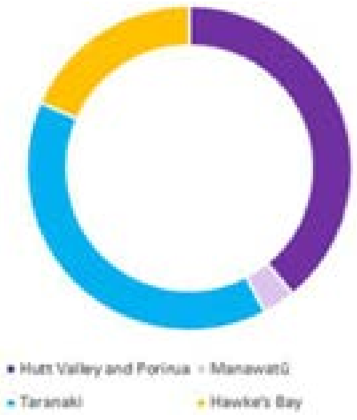
Figure 5.23 shows the expenditure programme across our CPS with nine projects forecast during the planning period, and an expected $1.63 million of investment across capital and complex operational expenditure on our networks. Of the nine planned projects, three are in our 2024 GWP (next 12 months), combining for a total of $653,000 in FY24. These figures are derived from our TPK (Issues Register) and represent our 10-year forward programme. Note, some projects are in our TPK, adding to our project count but are yet to have a price set.

Figure 5.23: CPS expenditure programme

Investment programme
(Opex + Capex)
$1.63m

Projects in the pipeline
9

Regional expenditure forecast

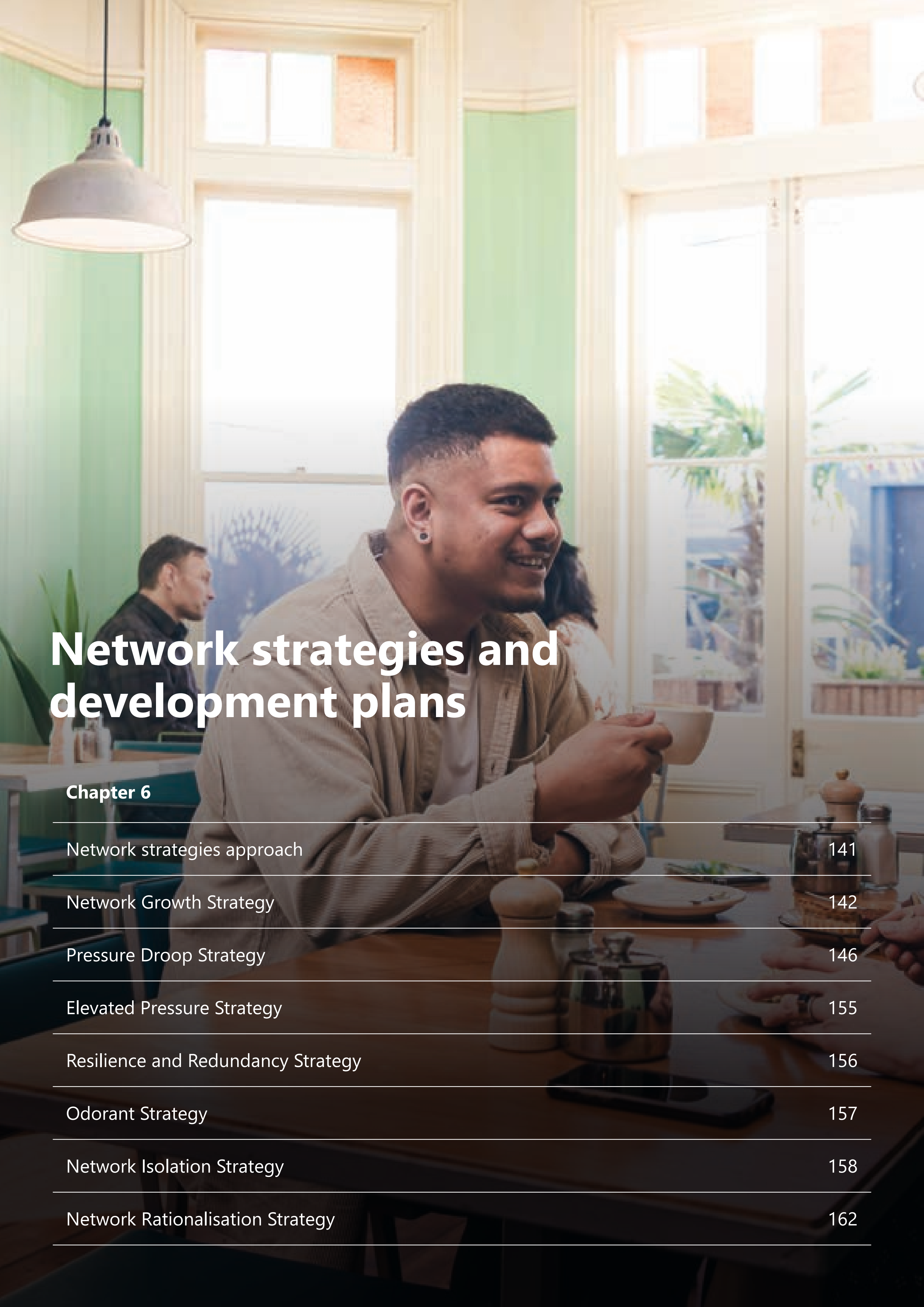


GWP 2024
Number of projects:
3
Forecast expenditure (Opex + Capex):
$653,000

Table 5.49 shows the single CPS project in the 2024 GWP (next 12 months). The other projects in the pipeline can be found in section 8 Expenditure Plan Summary and Maps, set out by region.

Table 5.49: GWP24 CPS project

Project description	Project region	Expenditure category	GWP24 design/ construct	Description of works
IP CP renewal – Upper Hutt	HVP	Capex	Construct	Renewal of CPS in Upper Hutt to protect steel pipeline and allow it to exceed its expected life.



Network strategies and development plans

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6. Network strategies and development plans

Network strategies provide direction for strategic investment and network performance requirements. This section describes our network strategies, the decisions they inform, and the projects/plans they produce for each region covered by our network. For each network strategy, we will describe the major programme of works that we have forecasted. Our development plans have a strong focus on the decision-making criteria to prioritise intervention decisions based on safety and delivery. We describe the options we have considered and those we prefer based on cost, performance, efficiency, and ability to deliver. The list of projects in this section provides greater levels of detail on a five-year horizon. When possible, we extend the description to 10 years.

6.1 Network strategies approach

Our network strategies, summarised in Chapter 4, are defined in more detail in this section. The focus in this chapter is network-related projects rather than projects based on individual assets, as seen in Chapter 5. Network strategies provide direction for strategic investment and network performance requirements. We have seven network strategies, as described in Table 6.1.

Table 6.1: Network strategy definition

Network Strategy	Definition
Network Growth	The changing operating environment reflects our transition from a growth strategy to a prudent focus on maintaining the customer base. For network growth we will respond to the residential market demand.
Pressure Droop	Ensure sufficient capacity to obviate low pressure in any part of the network. For network growth we will respond to the residential market demand.
Elevated Pressure	Preserve personnel and public safety.
Resilience and Redundancy	Maintain supply availability.
Odorant	To ensure adequate odorant within our network.
Network Isolation	Increase the disaster resilience of our network against high-impact low-probability events.
Rationalisation	Improve efficiency through optimised networks.
Non-network Solutions	We actively monitor emerging technologies and non-network solutions that could potentially serve as alternatives to, or be used in conjunction with, traditional network investments. We have not yet implemented any non-network alternatives and, as of now, we have not identified any emerging technologies that show significant promise.

Network risk

Powerco assesses general network risks through a regular (i.e., five-yearly) Formal Safety Assessment (FSA), as outlined in Appendix 4. We last undertook an FSA in May 2023. Our network strategies include controls to mitigate the strategic risks identified in the FSA. The identified controls are developed in alignment with our five value drivers and aim to ensure reduced safety concerns and reliable delivery of gas to our customers. The key risks identified by the FSA are set out in Table 6.2.

Table 6.2: Key networks risks related to network strategies

FSA	Risk	Consequence	Strategy	Control
A 4.2	**Gas outage**	Loss and re-gain of supply where flame failure device is not present.	Pressure Droop	Droop limits
A4.1: #1, #4	**Equipment venting**	Overpressure on the inlet that causes physical damage to the equipment Gas Measurement System (GMS) or DRS.	Elevated Pressure	Network pressure design Pressure protection alignment
A4.1: #5	**Faulty district regulator station (DRS) equipment**	Because of a fault, DRS equipment fails, resulting in gas outage.	Resilience and Redundancy	Twin-stream
A4.6	**Third-party interference**	Assets are damaged or operated by an unauthorised person, including vandalism.	Resilience and Redundancy	Protect stations from vehicle impact (i.e., undergrounding)
A4.2 A4.3	**Gas release (undetected)**	An equipment vents gas that is not detected until it reaches high concentration in the air.	Odorant	Gas odorisation management
A4.1	**Gas release (uncontrolled)**	Major gas leak, fire, explosion.	Network Isolation	Emergency isolation valves, isolation plans

Network condition and performance

Network pressure, regulator stations (configuration, componentry, and location), odorant concentration, and isolation valves (location and operability) are modelled, monitored, and assessed for compliance regularly to identify any breaches of our network strategy criteria. We monitor network performance through a variety of avenues, which are further described in each respective network strategy. When non-compliant events are detected, an item is entered into our Te Puni Kāpuni – Issues Register (TPK), and options are assessed to determine the most viable solution with consideration of improved safety, cost, ease and safety of construction, network security, and performance.

By continually monitoring the performance of our network, we can make informed decisions about future investments and ensure that our asset class strategies and plans are up to date to achieve our Asset Management Objectives. Each subsequent section describes the criteria used and the resulting expenditure associated with each network strategy.

6.2 Network Growth Strategy

Network growth results in increased utilisation of the existing assets which, in the long-term, leads to more competitive and efficient customer pricing.

We aim to accommodate network growth and maintain our residential customer base by:

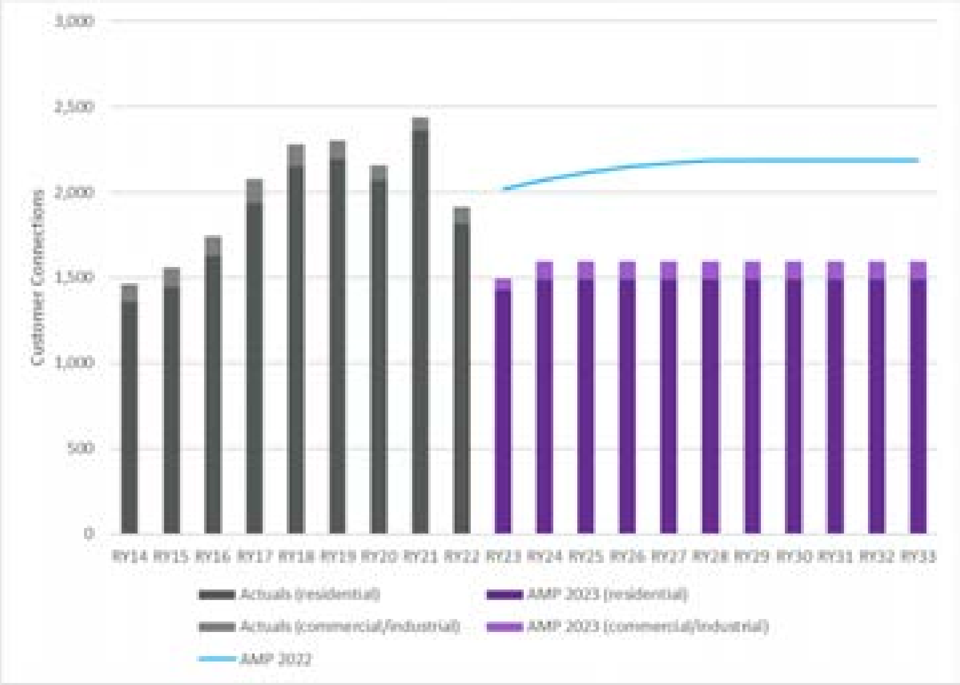
- Reticulating new development areas (subdivisions) linked to our existing network.
- Connecting infill new builds or infill subdivisions (existing parcels subdivided into two to 10 dwellings).
- Connecting customers directly fronting our mains (within 40 metres) or re-connecting previous customers now disconnected.
- Considering current information regarding network use and engaging with customers to project customer trends.

There have been considerable changes in our operating environment, and we forecast a period of transition where new connection numbers, network growth and the overall demand for gas reduces. Demand for gas from industrial and large commercial customers is reducing and will continue to reduce as this sector executes its plans to reduce emissions.

Recent reduction in customer connections and new developments is reflective of a slower economy, post the 2020-22 COVID-19 response, and is consistent with a corresponding reduction in building consents. While we expect applications for connections to pick up as the economic situation improves, because of the increasing cost of gas, we do not anticipate a return to the growth experienced from 2018-20.

Our projected customer connection numbers are shown in Figure 6.1. Given the pathway towards a low carbon future is focused on a transition to biogas and hydrogen, we forecast residential connections and disconnections will align to historical averages prior to the 2018-19 new housing boom and COVID-19, but with a lower consistent growth trend. Commercial gas volumes are forecast to reduce through the transition period to 2050.

Figure 6.1: Customer connection numbers actual v forecast per annum



Much of our growth expenditure related to connecting new customers is reactive (~90%) and is achieved through reticulation of new subdivisions as they are developed. The expenditure forecast for new developments is derived from a detailed system growth budget forecast set out in Chapter 7. We have also accounted for increasing investment opportunities to expand our network to reach renewable gas opportunities from the beginning of RY27, steadily increasing to the end of the planning period.

The remainder of growth expenditure is spent on major projects scheduled throughout the planning period in the form of network reinforcements to increase capacity to cater for projected growth. These are discussed in Section 6.3 – Pressure Droop Strategy, and Schedule 12b – Report on forecast utilisation. As most new subdivision growth occurs at the extremities of our networks, the capacity is impacted not only by a rise in gas volumes, but also by a larger pressure drop resulting from longer distances of gas conveyance.

Growth rates are modelled with consideration of:
- Historical infill rates and council planned growth rates.
- Greenfields growth through direct relationships with developers and councils to assess the appetite for gas in subdivisions and where land is designated.
- Diversity factors for both residential subdivisions and large commercial/industrial customers.
- Applying our own assessment in the near term for how quickly land will be developed based on present trends (number and new lots).
- A reduction in growth is also reflective of our assessment that some developers will not support higher capital contributions.

Even by collecting intelligence from council zoning (e.g., location of industrial parks), it is difficult to design a network that will match what customers want without knowing what type of activities are expected in the region, and therefore the requirements for specific loads and usages.

As the bulk of growth occurs on the extremities of our networks, it has a much greater impact on capacity and, therefore, requirements for reinforcement. Modelling growth rates allows us to determine the extent and timeline of reinforcements.

6.2.1 Network Growth Strategy development plans

Despite our changing operating environment, growth is occurring in all regions of our network, with the largest growth taking place in Wellington, Porirua, and Hawke's Bay. This section provides a summary of the forecast growth in each region.

6.2.1.1 Wellington

Most of the growth in Wellington is taking place on the northern part of the subnetwork. The Wellington Urban Growth Plan shows the potential extension of the city along the state highway to Porirua. This will occur on both the west of the state highway, from Churton Park to Tawa, via Stebbings Valley, and on the east, from Grenada Village and Woodridge to Grenada North, via Lincolnshire Farms. This aligns with the plans we have discussed with potential developers.

Growth in the area is set to occur around:
- Churton Park
- Crofton Downs
- Grenada Village
- Woodridge

6.2.1.2 Hutt Valley and Porirua

In Hutt Valley, a large subdivision in Wallaceville introduced constraint on the low intermediate pressure (LIP) pressure system, which has recently been remedied. Growth in Wainuiomata is expected to result in constraint on the LIP pressure system later in the planning period. In Lower Hutt, growth is expected in Kelson, where we have plenty of capacity. In the remainder of Lower Hutt where we have some pressure constraint, only small subdivisions are being developed, which should not impact that part of our network. However, there are major plans to increase the city's footprint, so we will continue to actively monitor these areas.

Subdivision growth rates in Porirua are high and will require some significant network expansion and reinforcements during the planning period.

The primary areas of expected growth, for which we are planning additional supply capacity to, are:

Hutt Valley
- Arakura (Wainuiomata)
- Kelson (Lower Hutt)
- Wallaceville (Upper Hutt)

Porirua
- Aotea
- Elsdon
- Grenada North
- Kenepuru
- Plimmerton/Pukerua Bay
- Whitby

6.2.1.3 Taranaki

In the next five years, we expect to reticulate several subdivisions in New Plymouth in a staged manner to align with the developments. The biggest growth area is in the northeast part of Bell Block, towards the airport.
The primary areas of growth in the region are:
- Bell Block – Airport Drive and Wills Road
- Fernbrook
- Mangorei Road

Additionally, we expect to see new subdivisions in both Hāwera and Ōakura, where we have sufficient capacity to cater to both developments.

6.2.1.4 Manawatū and Horowhenua

We continue to see sustained growth in the region. In Feilding and Levin, new subdivisions are being connected to our network as they grow. We anticipate the need to reinforce the southeast of Levin as growth occurs.

Palmerston North, our third largest subnetwork in terms of customers, is expected to grow significantly during the planning period. As well as subdivisions expanding the city in the south (Summerhill), the city council is planning a major expansion on the eastern side of the city (Whakarongo). This is accompanied by significant industrial and commercial activity.
In Palmerston North, we expect to see growth in the following areas:
- Awapuni
- Centennial Drive
- Freedom Drive/Whakarongo
- Summerhill

6.2.1.5 Hawke's Bay

Growth in the region is occurring in Napier, Hastings, and Havelock North. Subdivision growth as well as large rates of infill growth have occurred in Havelock North in recent years. We have recently reinforced the supply into Havelock North to cater for this growth. Additionally, there are several large subdivisions in Hastings and Napier with the potential for large increases in size during the planning period.
The main developments are:
- Te Awa/Willowbank Ave (Napier)
- Mission Estate (Napier)
- Parklands (Napier)

- Wharerangi Road (Napier)
- Frimley/Lyndhurst (Hastings)
- Iona (Havelock North)
- Brookvale (Havelock North)
- Arataki Road (Havelock North)

6.3 Pressure Droop Strategy

Poor pressure events on the network potentially result in customers losing gas supply. As such, it is important to be able to detect and prevent any poor pressure event, under typical network operating conditions. Droop characteristics for each network are recorded and captured as part of normal operating procedures, and these values are utilised to determine how the network is operating. Limits on acceptable droops have been set and are maintained to ensure customer interruptions are limited in normal operation.

Providing customers with gas at the right pressure relies on ensuring there is sufficient capacity in our pipelines and regulator stations to meet pressure requirements at the furthest extremities, or highest usage points, on our network. Network modelling, combined with pressure monitoring, allows us to simulate current network performance, and use forecast growth to predict future performance and identify reinforcement solutions where required.

Our approach to managing pressure droop in this planning period takes into consideration:

- Pressure systems that are, or are expected to become, highly utilised (meaning a greater than 40% drop from nominal operating pressure) are reflected in Schedule 12b. These systems are monitored for pressure permanently.
- Pressure systems that are, or expected to, reach 50% droop are planned for reinforcement if a high growth rate is expected.
- Pressure systems that reach 60% droop through pressure monitoring are reinforced immediately.
- $2.35 million of capital and operational investments spread across seven planned and forecast projects.
- Although network modelling helps to forecast when a network will become constrained and subsequently require reinforcement investment, capital investments are often held off until actual pressure performance criteria is observed on the network.
- The work programme comprises five network capacity reinforcement projects.
- Many of our network pressure issues have been resolved in the past 5-10 years, reducing the amount of future investment required in this area and providing capacity in the network to manage forecast growth. This allows us to transfer some expenditure to our asset replacement and renewal (ARR) programme.
- Future reinforcement plans in areas where pressure performance issues have been identified are discussed in section 6.3.8 and Schedule 12b.

6.3.1 Pressure Droop Strategy objectives

The objective of the Pressure Droop Strategy is to build sufficient network capacity to ensure that no customers are impacted by poor network pressures and to allow for all residential/small commercial gas connection applications to be accepted. This strategy provides guidance on growth forecasting, criteria for minimum allowable pressures (pressure droop with regards to network capacity, and lowest functional operating pressure with regards to equipment specification, i.e., gas meter system – GMS inlet pressure requirements), as well as pipe sizing and gas velocity limits. These, along with our network modelling and pressure monitoring programme, allow us to identify when and what reinforcement projects are required. The strategy aims to strike a balance between cost and delivery risk.

6.3.2 Pressure Droop Strategy overview

Projects identified through this strategy aim to reinforce the network to improve constraints that arise from either:

- Network growth (GRO) – Are expected to occur because of increased customer demand as described in section 6.2, or
- Capacity constraints (quality of supply – QOS) – If constraints on the amount of gas we can provide currently exist.

Forecasts provided from our commercial team are used in conjunction with network modelling to predict network performance. Detailed plans in Schedule 12b are prepared for only five years.

6.3.3 Types of issues

The main types of low pressure (LP) issues that occur are summarised in Table 6.3.

Table 6.3: Key pressure droop risks

Specific threat	Specific cause	Solution
Low pressure at network extremity or high demand area	Inadequate main pipeline diameter.	Overlay pipeline in larger diameter.
	Inadequate nominal operating.	Increase nominal operating pressure.
	Lack of network interconnectivity.	Interconnect low pressure part of network with higher pressure part of network.
	Insufficient supply points.	Add a new supply point from a higher pressure system via a regulator station.
Low pressure at customer installation control point	Inadequate service pipeline diameter.	Overlay service pipe in larger diameter. Install compressor (customer side).
	Customer load larger than contracted.	Discuss possibility of reducing customer load.
Insufficient pressure at regulator station outlet	Improperly sized regulator.	Replace regulator or regulator orifice with larger size.

Table 6.4 summarises the network performance status keys we utilise to grade the current and future performance of our networks. Each section (6.3.8.1-6.3.8.5) summarises the major network development plans required for each region. They also give the current and expected performance levels if no projects are carried out.

The projects included in the sections consider network performance over the next five years. This is reflective of our current knowledge and understanding of network performance and our planning being less accurate after a five-year horizon.

Table 6.4: Network performance status key

Status	Network performance and maximum pressure droop
🟢	Satisfactory (<40%)
🟡	Low pressure (>40%)
🟠	Very low pressure (>60%)
🔴	Loss of supply (>80%)

Any pressure systems not mentioned in this section or in Schedule 12b are performing at a satisfactory level and are expected to remain that way across the planning period. No reinforcement projects are required, and we will continue to monitor those systems.

6.3.4 Network capacity

Pressure droop is a measure of the pressure drop from the nominal operating pressure (NOP) and allows us to measure residual capacity in our networks.

In 2020, our Pressure Droop Strategy was updated, increasing the maximum allowable pressure droop to 50% (up from 40%[23]). This increase in allowable droop was made because of higher confidence in our network modelling, better coverage of pressure monitoring data loggers across our networks, and more consideration of the rate of growth and its impact.

Additionally, several of our networks continue to run in the 50% droop range with no ill effects and, with little to no growth expected, they remain stable with sufficient buffer for unexpected demand. A 50% droop level represents about 80% capacity being utilised, leaving additional capacity for unexpected demand, such as abnormally cold weather, existing customer-specific volume growth (e.g., installation of additional appliances), and infill, subdivision, and commercial growth beyond what is known in our growth forecasts. If the trigger of 50% droop is reached, we undertake a detailed analysis that potentially leads to reinforcement work on the network.

Part of the analysis is a reassessment of the risk that customers lose supply through a poor pressure event, considering our growth projections. With all the above considerations, there is no increased risk to our network delivery. Any observed droop above 60% on the network triggers an immediate reinforcement project to remedy the high droop levels.

To increase capacity on the network, the main approaches are:

- Construct high-capacity mains (replacing older, smaller diameter mains) to minimise pressure losses along a defined route.
- Add more points of supply on the network, for example:
  - a) A new regulator station supply from a higher-pressure network, which allows more gas to be injected into the system.
  - b) A mains interconnection with another less-constrained part of the network.
- Increase the NOP within permitted limits.

The choice of approach is dependent on the specific characteristics encountered in each network, the type of end-customers, and the circumstances that lead to the pressure droop.

In addition to poor network capacity, we occasionally need to replace regulator stations that have reached their delivery capacity, as identified in section 6.3. All our stations are running at satisfactory utilisation and, during the planning period, we do not plan to upgrade any stations because of capacity constraints.

6.3.5 Pipe sizing

Mains pipes are sized to ensure we have adequate capacity now and into the future so that further reinforcement is not required, ideally, during the lifecycle of the new mains.

Service pipe sizes are designed to ensure customer GMS inlet pressure requirements can be met at peak customer load during minimum operating levels on the network.

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[23] All pressure systems that are highly utilised (greater than 40% drop from NOP) are permanently monitored and reflected in Schedule 12b.

Gas velocity in pipes is also considered in sizing of mains to ensure velocities remain within allowable limits, as higher velocities result in significantly higher rates of pressure drop. We periodically investigate all pipes in our network modelling to identify high-velocity mains and add them to our TPK (Issues Register).

6.3.6 Pressure monitoring

We use pressure data logging devices to measure the pressure of our network. All our pressure loggers are installed directly onto our network and have remote capabilities, which provide daily pressure data and alarm capabilities. We run a pressure monitoring programme to:

- Regularly monitor non-constrained networks every three years, or reactively (whichever comes first), informed by our modelling tool or reported network issues.
- Maintain permanent active pressure monitoring on our highly utilised pressure systems with >40% droop (physically recorded on the network or modelled under simulated peak conditions).

Acquiring network pressure data allows us to improve accuracy of our network models and detect any changes in network performance between model builds.

6.3.7 Network modelling

We use DNV's Synergi network modelling software to simulate network operating conditions, allowing us to perform capacity assessments and make decisions on network investment. This is a risk-based integrity management simulation tool that enables us to reduce the likelihood of unscheduled downtime or incidents due to asset failure. Our network modelling is mature and allows us to:

- Simulate network performance under a 1-in-20-year peak load.
- Forecast accurate network capacity.
- Gauge pressure performance of our future networks.

This allows us to identify options for reinforcement required to bring our networks to acceptable levels.

6.3.8 Network droop development plans

Network performance and plans are discussed in more detail below, broken down by region. Chapter 8 references all network diagrams and all network strategy projects greater than $65,000.

6.3.8.1 Wellington

The Wellington region consists of a single subnetwork fed from Tawa Gas Gate supplying seven main medium pressure (MP) systems and two low pressure (LP) systems through the Wellington intermediate pressure (IP). Table 6.5 summarises the Wellington capacity reinforcement plans.

Table 6.5: Wellington capacity reinforcement plans

Pressure system	Current pressure performance	Pressure performance (if status quo)	Pressure performance (if projects completed)[24]	Proposed projects
Wellington IP	🟠	🟠	🟡	Tawa Gas Gate Station Regulator Upgrade – RY32
Wellington 25kPa	🟡	🟡	N/A	None – Active monitoring
Wellington North	🟢	🟡	N/A	None – Active monitoring
Karori	🟡	🟡	N/A	None – Active monitoring

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[24] Future expected pressure performance with growth at 2028 to align with Schedule 12B.

Pressure system	Current pressure performance	Pressure performance (if status quo)	Pressure performance (if projects completed)[24]	Proposed projects
Chartwell	🟢	🟡	N/A	None – Active monitoring

Wellington’s 25kPa pressure system has seen improvements since being interconnected with the Wellington CBD. This network change was a direct result of the decade-long pressure elevation programme to increase capacity for commercial growth in the Wellington CBD from LP (7-10kPa) to high intermediate pressure (HIP, 25kPa), which was completed in 2022.

In the northern suburbs, the city is expanding with new buildings and subdivisions, and it is expected that the city will eventually form one continuous urban area all the way to Tawa. Some LP points have been identified on this part of the network and have been, and will continue to be, remedied as growth continues. As discussed in the 2022 AMP Update, this station was successfully turned off for the entire duration of the 2022 winter with no ill effects to the Wellington 25kPa pressure system. This has seen relief to the lowest pressure point on the Wellington North pressure system. Additionally, the Westchester Drive overlay project was completed in 2022, resulting in significant improvements in the pressures in Churton Park. The low point of the Wellington North pressure system has now shifted to Grenada Village. Growth in Grenada Village has been slow, and we no longer expect to see network pressures breached during the planning period. The Mark Avenue Overlay project, as described in the 2022 AMP, has been deferred indefinitely.

The Wellington IP system remains under scrutiny as we monitor the impact of the network reconfiguration. Performance issues on the Karori lateral will remain in place because the Karori Rationalisation project has been halted indefinitely, having been deemed of inadequate value. With no growth expected in Karori, we do not expect the pressure to drop further. There is sufficient pressure to adequately supply Karori. If pressure does drop below acceptable limits, we will upgrade the Tawa Gas Gate station regulators to provide a slight boost in pressure.

The new Crofton Downs subdivision has continued to connect, with a high uptake rate. Pressure monitoring has confirmed this system should remain compliant with droop levels upon completion of the development. We no longer anticipate the need to uplift the pressure in this system.

The remainder of Wellington’s pressure systems are performing well.

6.3.8.2 Hutt Valley and Porirua

The Hutt Valley and Porirua region consists of three subnetworks, the first feeding the Hutt Valley from Belmont Gas Gate, supplying 10 main MP systems through the Belmont high intermediate pressure (HIP) and low intermediate pressure (LIP) systems. The second, feeding Porirua from two gas gates, with Waitangirua and Pāuatahanui No 1 jointly supplying the Mana MP system, and Waitangirua solely feeding another six main MP systems. The third subnetwork feeds a small area with a handful of rural customers.

Hutt Valley and Porirua subnetworks are mainly operating in the MP range, supplying residential customers. The subnetwork in Hutt Valley runs over a large geographical area, from the gas gate in Belmont, as far as Upper Hutt in the north, Eastbourne and Wainuiomata in the south, and Ngauranga Gorge in the west. In Porirua, the subnetwork supplies an area from Plimmerton in the north, to Tawa in the south, and includes Tītahi Bay to the west. We plan to expand the network to supply the Judgeford Hills development east of Transmission Gully. Table 6.6 summarises the Hutt Valley and Porirua capacity reinforcement plans.

Table 6.6: Hutt Valley and Porirua capacity reinforcement plans

Pressure system	Current pressure performance	Pressure performance (if status quo)	Pressure performance (if projects completed)	Proposed projects
Belmont LIP	🟡	🟠	🟢	Wainuiomata IP Reinforcement – RY28
Lower Hutt LMP	🟡	🟡	N/A	None – Active monitoring
Wainuiomata	🟢	🟢	N/A	None – Active monitoring
Pāuatahanui IP	🟡	🔴	🟢	Pāuatahanui IP Upgrade – RY26
Elsdon LMP	🟡	🟡	N/A	None – Active monitoring

Lower Hutt low medium pressure (LMP) system remains constrained. However, the pressure constraint on this system is limited to a single branch. We maintain active monitoring at this point, and we consider this situation acceptable as the planned growth will not impact this system.

Belmont LIP system remains constrained. However, growth in Wainuiomata has slowed, with no requirement for reinforcement expected during the planning period.

With large subdivision growth expected north of Mana, reinforcement work will need to be carried out on the Pāuatahanui IP system in RY26. This reinforcement will only cater for half of the projected growth, therefore further reinforcement may be required beyond five years, depending on the rate of uptake in the new development.

6.3.8.3 Taranaki

The Taranaki region consists of 17 subnetworks supplying mostly small towns and a major subnetwork in New Plymouth feeding four main MP systems through its IP system. Table 6.7 summarises the Taranaki capacity reinforcement plans.

Table 6.7: Taranaki capacity reinforcement plans

Pressure system	Current pressure performance	Pressure performance[25] (if status quo)	Pressure performance (if projects completed)	Proposed projects
New Plymouth IP	🟡	🟠	N/A	None – Active monitoring
New Plymouth MP	🟡	🟠	N/A	None – Active monitoring
Bell Block North	🟢	🟡	🟢	Bell Block Supply Improvement – RY30
Pātea	🟡	🟡	N/A	None – Active monitoring
Lepperton	🟠	🟠	N/A	None – Active monitoring

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[25] Refer to Schedule 12B for commentary relating to LP performance and the trigger for intervention.

Pressure system	Current pressure performance	Pressure performance[25] (if status quo)	Pressure performance (if projects completed)	Proposed projects
Waitara MP	🟡	🟡	N/A	None – Active monitoring

The latest results of our pressure monitoring programme show that most of the pressure systems are within the droop limit, therefore do not require any major investment in the short term.

There are six pressure systems that are near or exceeding 50% droop in Taranaki. Three are in New Plymouth, and three in Pātea, Waitara and Lepperton. In New Plymouth, previous projects have increased the performance of all its pressure systems. On the New Plymouth MP pressure system, only localised issues have been identified near Port Taranaki. The Hutchen Place Reinforcement project was diligently assessed for options and the only economically feasible options provided minimal capacity improvements. It was decided to not proceed with this project, which unfortunately means there is no remaining capacity at Port Taranaki. Bell Block North and the New Plymouth IP systems are under active monitoring.

In Waitara, seasonal pressure drops have occurred on a smaller diameter main supplying a chicken farm off Waitara Road. However, these do not currently pose a problem. If increased consumption occurs in the area, we will transfer this main over to the Lepperton pressure system that was isolated from Waitara in RY19 and now operates at a higher pressure. Lepperton continues to see pressure constraints at extremities where large chicken sheds are connected, even after the pressure uplift in 2019. No pressure issues have been reported, and with no growth in demand expected, we will continue to monitor performance with no further action.

Significant growth is expected in Bell Block North, however, the area has been slower to develop than previously expected. We do not anticipate reinforcement until 2029.

6.3.8.4 Manawatū and Horowhenua

The Manawatū and Horowhenua region consists of 13 subnetworks supplying mostly rural areas. The major subnetwork, in Palmerston North, feeds six main MP systems through its IP system. The region mainly comprises small-town subnetworks, usually supplying a few large commercial or industrial customers. Table 6.8 summarises the Manawatū and Horowhenua capacity reinforcement plans.

Table 6.8: Manawatū and Horowhenua capacity reinforcement plans

Pressure system	Current pressure performance	Pressure performance (if status quo)	Pressure performance (if projects completed)	Proposed projects
Palmerston North LMP	🟡	🟡	🟡	None – Active monitoring
Summerhill	🟢	🔴	🟢	Summerhill Reinforcement – RY31
Feilding	🟢	🟡	🟡	None – Active monitoring
Levin	🟢	🔴	🟢	Queen Street East Overlay – RY29
Oroua Downs MP	🔴	🔴	🔴	None – Active monitoring

In Palmerston North, our third largest subnetwork in terms of customers, we are expecting strong residential growth in the south and expect strain on the Summerhill pressure system. Feilding and Levin have significant residential growth occurring and are actively monitored for growth. We expect the need to reinforce Levin in the southeast because of new subdivisions. Other subnetworks currently operate at a satisfactory level.

The Hokowhitu suburb within the city relies on small-diameter pipes. The Palmerston North Rationalisation project, driven by safety and efficiency, was completed in 2022 and has remedied capacity issues that were occurring. Although there are some issues in the west, the Palmerston North West Rationalisation project has been deferred indefinitely as there is more value found in other projects. Summerhill is identified as the biggest area for growth in Palmerston North, and we are actively monitoring demand and pressure levels. One large development has been significantly delayed, therefore growth in demand has been much less than previously forecast and modelled. As a result, we do not anticipate the need to reinforce this system until 2031.

6.3.8.5 Hawke's Bay

The Hawke's Bay region consists of a single subnetwork fed from Hastings Gas Gate supplying four main MP systems and one LP system through the Hastings IP. The subnetwork supplying Napier and Hastings conveys the highest volume per customer of all our networks because of the presence of large industrial customers. Table 6.9 summarises the Hawke's Bay capacity reinforcement plans.

Table 6.9: Hawke's Bay capacity reinforcement plans

Pressure system	Current pressure performance	Pressure performance (if status quo)	Pressure performance (if projects completed)	Proposed projects
Hastings LMP	🟢	🔴	🟡	Havelock North Reinforcement Stage 2 – RY28
Taradale	🟢	🟠	🟢	Taradale Supply Upgrade – RY29

Growth in the region is the highest on our network and is supported by large subdivision activity in both Napier and Hastings. We are monitoring these developments and need to carry out reinforcement work in Taradale and Havelock North.

Havelock North has experienced significant growth in gas customers – from existing homes connecting to gas and new subdivision growth. This growth put constraint on the southern end of Hastings LMP pressure system, which was fed off a single main coming from Hastings. In 2022, we completed the first stage of a long-term reinforcement project. Carrying out the project in stages allows us to defer some expenditure until growth is actualised in future years. The first stage involved running a secondary main from the Hastings Gas Gate towards Havelock North, which provided more capacity into the constrained area.

6.3.9 Expenditure

Table 6.10 shows the expenditure plans across our network pressure droop programme. The projects are derived from our Pressure Droop Strategy and network modelling plans, with eight projects forecast during the planning period, with an expected $2.35 million of investment.

Table 6.10: Network pressure droop projects

Project description	Project region	Delivery year	Description of works
Tawa Gas Gate Station Regulator Upgrade	Wellington	RY32	The transmission network supplying Wellington cannot maintain the required inlet pressure to Tawa Gas Gate under peak flows. The current regulator cannot maintain its delivery pressure. We plan to change out the regulators to a different type, which will allow the delivery pressure to be met, improving the supply, and improving the pressure droops at the Karori and Newtown extremities of the IP. The regulator type has already been selected and designed. This project will be enacted when pressure below 350kPa is observed.
Wainuiomata IP Reinforcement	Hutt Valley and Porirua (Hutt Valley)	RY28	Growth in demand in Wainuiomata has been slower than forecast and the pressure at the extremity of the Belmont LIP at Norfolk DRS remains stable. As mentioned in the 2022 AMP Update, this project will be delivered when pressure/capacity monitoring shows it is needed, currently expected in RY28.
Pāuatahanui IP Upgrade	Hutt Valley and Porirua (Porirua)	RY26	North of Mana near Porirua is expected to see the development of several thousand lots over 20+ years, beginning in RY25 (originally expected by RY22). This subdivision activity has been delayed several years, however, we intend to support this growth by reticulating the suburb. The existing supply point is expected to become constrained within the first year of this development. We will need to upgrade the Pāuatahanui IP system supplying the Plimmerton regulator station to ensure delivery needs are met for the growing number of customers. We have already completed survey requirements for a pressure increase, and we plan to uprate the Pāuatahanui IP from 1,050kPa to 1,500kPa.
Bell Block North Supply Improvement	Taranaki (New Plymouth)	RY30	Subdivision growth is expected to continue in Bell Block North towards the airport. As growth extends away from the supply points, we expect the need to reinforce the network. We plan to upgrade the regulator stations and do some mains interconnections and overlays with larger diameter pipe.
Summerhill Reinforcement	Manawatū and Horowhenua (Palmerston North)	RY31	The growth occurring in the southern part of Summerhill will put strain on the extremities of the pressure system. In the 2020 AMP, we indicated the need to reinforce by RY24. However, with growth slowed and several developments previously forecast now on hold, pressures remain at reasonable levels. We plan to reinforce the system in RY31 by increasing the NOP from 100kPa to 150kPa.
Queen Street East Overlay	Manawatū and Horowhenua (Levin)	RY29	The growth occurring in the southeast of Levin is expected to put strain on the smaller diameter mains supplying the area. We plan a reinforcement via an overlay of the smaller diameter main pipes with larger diameter main pipes.
Havelock North Reinforcement – Stage 2	Hawke's Bay (Hastings)	RY28	The first stage of this project involved running a secondary main from the Hastings Gas Gate towards Havelock North, which provided more capacity into the constrained area. This main was run in higher rated pipe, which will allow us for stage 2, to increase the pressure and add a new supply point into Havelock North. If growth continues, stage 3 will see us continue the HP pipeline directly into Havelock North, bringing the supply point even closer.
Taradale Supply Upgrade	Hawke's Bay (Napier)	RY29	The Parklands subdivision mentioned in the 2020 AMP is still underway, with a slower than expected growth and uptake rate occurring. This is evident through connection rates and pressure trends. This reduced rate of uptake provides more time until capacity upgrades are required. There is also subdivision growth in Guppy Road, increasing the demand on the network. Droop is now expected to reach 50% by RY27. We plan to raise the network operating pressure from 150kPa to 210kPa, which will allow for the possibility of a merge with the adjacent Napier LMP pressure system. This will provide added security of supply to both areas. We will continue to monitor the performance of the pressure system as the growth occurs, with design planned for in RY28, and surveying, equipment upgrades, and the pressure uplift occurring in RY29.

6.4 Elevated Pressure Strategy

The purpose of the Elevated Pressure Strategy is to reduce safety and delivery risk associated with elevated pressure, and to ensure that supply stations and customer equipment can operate adequately under a HP incident.

Elevated pressures on the network may cause damage to, or failure of, Powerco or customer assets. This is a potentially dangerous situation, and strict limits are placed on the maximum allowable operating pressure (MAOP) to ensure this does not occur. The performance of the network is reviewed regularly to ensure that safety systems are in place and operational safety measures are undertaken. Elevated pressures are normally because of upstream issues, so most measures undertaken will see over-pressure shut off (OPSO) valves automatically close and an alarm raised.

6.4.1 Elevated Pressure Strategy objectives

The main objectives are:

- Define MAOP for safety, monitoring, and control purposes.
- Ensure that no existing equipment is exposed to pressures above the equipment's manufacturer pressure rating, increasing likelihood of failure.
- Ensure that customer safety is maintained by not exposing installations downstream of GMS to a pressure greater than the installation's design.
- Minimise relief activating on our regulating stations.
- Prevent OPSO valves from shutting supply to large numbers of customers following a single over-pressure event.
- Standardise MAOP for all newly constructed pressure systems.
- Manage SCADA alarm setpoints.
- Provide guidance on raising/lowering MAOP of pressure systems.

6.4.2 Elevated Pressure Strategy overview

There are no identified networks with known issues that require Capex investment.

We are reviewing our regulator station setpoints and plan to standardise DRS relief and OPSO setpoints where practical. The intent being that, in the event any pressure system is exposed to elevated pressures, the reliefs will operate before OPSOs are shut, reducing the risk of supply loss. This will be delivered through our Opex maintenance programme.

6.4.3 Types of issues

The main types of elevated pressure issues that could occur are summarised in Table 6.11.

Table 6.11: Key elevated pressure risks

Specific threat	Specific cause	Solution
High pressure resulting in poor pressure or loss of supply	Relief valves or OPSO activated on regulator affecting supply.	Monitoring and detection of network pressure (SCADA). Regularly assess and standardise MAOP.
High pressure results in equipment failure and possible supply issues or gas release	Equipment fails because of pressure rating insufficient for high network pressure.	

6.4.4 Expenditure

There are no identified network elevated pressure issues that require Capex investment.

6.5 Resilience and Redundancy Strategy

Failure of assets is inevitable, but to ensure that customers do not lose gas supply, some redundancy must be designed into the network. Minimum requirements for network design help to ensure that a single asset failure will not affect an unduly large number of customers.

During failure of one of our assets (regulator working stream) or some other unexpected event, such as a third-party interference (contractor hitting a gas pipe, vehicle collision with regulator station), it is important that we can still maintain gas supply to networks with major customers or large customer numbers. This strategy ensures networks are designed to maintain supply in minimum redundancy scenarios.

Resilience and Redundancy Strategy highlights:
- Most of our regulator station resilience and redundancy requirements have been met through the design of regulator stations that have been renewed during the past five years, as well as a few upgrades that were completed directly out of this strategy.
- Additionally, we have installed SCADA onto seven regulator stations during the past three years to meet our monitoring requirements.
- All our regulator stations now meet the resilience and redundancy requirements for minimum redundancy.
- Only one of our current critical stations is lacking SCADA. This is the Cameron Road DRS in Waitara and is planned for installation in 2024.

6.5.1 Resilience and Redundance Strategy objectives

The purpose of the Resilience and Redundancy Strategy is to ensure we have the appropriate level of built-in redundancies to maintain supply to our customers during the failure of network equipment. This strategy is applied to all stations identified for replacement because of asset-driven risks, as identified in Section 6.3.

Network resilience, as part of operational reliability, is measured against the quantity, type and gas volume of customers who could potentially lose supply because of a single, reasonably foreseeable, failure event. This is managed through the following regulator station requirements:
- Single v twin stream
- Single station v multiple stations
- Underground v above ground
- Monitoring requirements

Lastly, to detect potential failures, we use a SCADA system with real-time monitoring and alarm capabilities on our high criticality stations, as well as pressure logging devices on our medium criticality stations. We have identified seven stations that will benefit from being connected to our SCADA system and will aim to install this on a priority basis.

6.5.2 Resilience and Redundancy Strategy overview

All our stations have been assessed for SCADA requirements and SCADA has been installed where necessary. There are currently no identified networks with known resilience and redundancy non-conformances.

6.5.3 Types of issues

The main types of resilience and redundancy issues that occur are summarised in Table 6.12.

Table 6.12: Key resilience and redundancy risks

Specific threat	Specific cause	Solution
Failure of asset resulting in poor pressure or loss of supply and/or release of gas	Failure of regulator because of deterioration or poor condition, or third-party interference (i.e., vehicle impact).	Twin-stream Undergrounding Monitor regulators Trunk mains between stations Monitoring system (SCADA)
	Failure of main pipe/valve because of deterioration, poor condition, or third-party interference (i.e., contractor strike).	Backfed network

6.5.4 Expenditure

Table 6.13 shows the expenditure across our resilience and redundancy programme with one project forecast during the planning period, with an expected investment of $50,000. The remainder of our expenditure on the SCADA asset class is for SCADA renewals as they reach end-of-life.

Table 6.13: Resilience and redundancy projects

Project description	Project region	Delivery year	Description of works
Cameron Road DRS SCADA Installation	Taranaki (Waitara)	RY24	Cameron Road DRS is the sole supply to Waitara, which contains approximately 1,300 customers. This network was previously connected to the Lepperton network and dual fed by the Waitara Road DRS, which has SCADA. Since being isolated from the Lepperton network in 2019, Waitara, which is now only being fed by one station, requires SCADA (more than 1,000 customers). We plan to install SCADA on the station in 2024.

6.6 Odorant Strategy

We ensure odorant is present to enable natural gas leaks to be detected. We assess the growth of our network and location of our test points, on a regular basis, to ensure our testing regime is effective.

Odorisation of natural gas is a key safety requirement of its distribution and use. Odorant serves as a detection method for loss of containment. It alerts the public of its presence at home and in the community. It also provides an early warning to third parties working near mains and services should there be an existing leak, or an accidental strike on a main or service.

Odorant highlights:

- We have had zero failed odorant readings on our network in the past three-and-a-half years. The last time we had an odorant reading failure was in March 2020.
- In the past three years, modelling of odorant fade combined with one-off sampling has allowed us to plan and remedy sections of pipe with no flow (‘dead-legs’) that were at risk of odorant fade.
- We reviewed our odorant test points in 2021. We will assess these again in 2026, at which point there may be some operational expenditure required to install some new test points.

6.6.1 Odorant Strategy objectives

This strategy ensures our network odorant levels are managed properly and that odorant test point locations are determined adequately and reviewed at required intervals. Additionally, it ensures the prevention and mitigation of odorant fade, specifically resulting from large lengths of pipe with minimal to no gas conveyance (‘dead-legs’). This strategy informs maintenance plans (driving Opex costs rather than Capex projects). Works include odorant point installation/relocation, monitoring, and flaring where required.

6.6.2 Odorant Strategy overview

In the event of any odorant failures, we will evaluate and control any associated risk (e.g., checking that the nearest upstream customer still has adequate odorant, checking if the problem can be economically controlled with regular flaring). These events are dealt with reactively when they are detected and are managed on a case-by-case basis.

6.6.3 Types of issues

The main types of odorant issues that could occur are summarised in Table 6.14.

Table 6.14: Key odorant risks

Specific threat	Specific cause	Solution
Low or no odorant	Inadequate odorant supply at network entry point.	Test odorant at gas gate.
	Inadequate odorant concentration at reference point or network extremity.	Test odorant at specified reference and extremity points.
	Odorant fade within low utilisation pipe ('dead-leg').	Sponsorship of a customer at the end of the 'dead-leg' to allow odorised gas to flow through the pipe. Routine flaring at intervals ensuring odorant remains within adequate levels. Decommissioning the 'dead-leg' from the network.
Inadequate testing locations	Network growth results in extremities beyond existing test sites.	Review test points every five years.

6.6.4 Expenditure

In addition to our usual operational expenditure for regular odorant point testing, we also anticipate some operational expenditure in 2026 to add or relocate some odorant test points. There are no network odorant issues that require Capex investment.

6.7 Network Isolation Strategy

In the event of a large asset failure, Powerco must have the ability to isolate the flow of gas to the damaged area. As such, a strategy has been developed to ensure that neither the public nor Powerco is exposed to undue risk in the event of an asset failure; and, where appropriate, isolation ability is designed into the network.

Network isolation highlights:

- Works for isolation valves in all our major six subsystems have been assessed and planned, with anticipated completion in 2029.
- We have installed five (out of 24) IP isolation valves during the past three years, including all of Wellington subsystem.
- We have installed 10 (out of 26) MP/LP sector valves during the past three years, including all of Wellington, with New Plymouth completion expected in 2024.
- $3.49 million of capital investment planned and forecast.
- Phase two of our isolation plans will see further improvement to isolation capabilities, enhancing the ability of major customers to remain connected (or be reinstated more quickly) during emergencies. These plans will begin in 2026 as we near completion of our IP and sector valves.
- The isolation plans have proven to be invaluable during annual emergency exercises.

6.7.1 Network Isolation Strategy objectives

The purpose of the Network Isolation Strategy is to improve our emergency response preparedness as we increase the disaster resilience of our network against high-impact, low-probability events (e.g., major earthquakes, third-party damage to IP main). Network isolation requirements are checked when the network is extended. All valves replaced through asset-driven means, as described in Chapter 5 (Main and Service Valves Asset Class), are cross-checked against this strategy.

6.7.2 Network Isolation Strategy overview

We are improving isolation capacity on a risk-based metric by installing new isolation valves throughout our six critical subnetworks. This enables us to isolate our network simply and quickly in case of a major event. We have identified where we need to install valves on our network – refer to Chapter 5 Table 5.29, Chapter 6 Table 6.16 and Table 6.17.

We expect to spend $4 million during the next five years for this initial alignment with our Network Isolation Strategy. The future phase of our Network Isolation Strategy aims to ensure that our major and critical customers are given a priority when isolation is required. In the event of a required shutdown of a large part of our network, we will look to maintain supply to these customers through a series of strategically located valves or, alternatively, by connecting these customers directly onto the HP backbone (IP) pipelines. Additionally, in the event of an entire network shutdown, this configuration would allow a quick reinstatement of supply to these customers. We expect to spend $1 million over three years from RY25 to RY27 for this next phase.

Overall, we foresee spending $5 million during the next eight years to ensure all our networks have the necessary isolation valves required to be prepared for any emergencies and to comply with our Network Isolation Strategy requirements.

6.7.3 Types of issues

The main types of isolation issues that occur are summarised in Table 6.15.

Table 6.15: Key network isolation risks

Specific threat	Specific cause	Solution
Cannot isolate during an emergency	Valve inoperable.	Maintain all isolation valves annually.
	Inadequate nominal operating.	Increase nominal operating pressure.
	Valve cannot be located.	Network plans with valve IDs, maps, information pages, etc.
	Valve is in incorrect location.	Perform test isolation of specific sectors or sections of the network.
IP gas release (or imminent risk of) requiring isolation of valve, resulting in large outage numbers	Inadequate number and/or location of IP isolation valves.	Install IP isolation valve(s) at strategic points to optimise cost of installation versus risk of complete network isolation (Gas Gate).
MP/LP gas release (or imminent risk of) requiring isolation of valve resulting in large outage numbers	Inadequate number and/or location of MP/LP sector valves.	Install sector valve(s) at strategic points to optimise cost of installation and number of customers per sector versus risk of complete network isolation (DRS).
Slow isolation response to MP/LP emergency	Too many MP/LP sector valves.	Minimise number of valves on a sector.
Slow reinstatement of supply following network isolation	Inadequate number and/or location of MP/LP sector valves.	Install sector valve(s) at strategic points to optimise cost of installation and response time versus risk of complete network isolation (DRS).

6.7.4 Intermediate pressure isolation

IP isolation valves ensure quick isolation of high IP pipelines conveying gas at high pressures, while minimising outages to customers. Locations for valves are determined strategically based on risk. Risk is determined on a probability and consequence basis. Probability is based on the length of main isolatable by a specific valve, and consequence is based on the 'cost' of losing supply (based on the marginal number of customers that would lose supply) if the valve were not present. To ensure efficiency in design, minimum isolatable lengths and number of customers are set.

We plan to install IP isolation valves on our six critical subnetworks as per Table 6.16.

Table 6.16: IP isolation plans

Subnetwork	Number of valves required	Number of valves installed to date	Status
Wellington	4	4	Completed
Belmont	8	0	Planned
Porirua	6	0	Planned
New Plymouth	2	1	Underway
Palmerston North	2	0	Planned
Hawke's Bay	2	0	Planned

This programme of work is being carried out across a 10-year period. The total spend to bring our critical subnetworks up to IP Network Isolation Strategy requirements will be $2.1 million.

6.7.5 Sectorisation

Our sectorisation plans create isolatable sectors that minimise the impact of disruption if a large isolation is required. The strategy aims to make all subnetworks isolatable into sectors with a maximum of 5,000 customers, while reducing that number to 500 customers for a CBD and steel networks.

There are two scenarios this strategy is attempting to mitigate:

- A large incident occurs within an area. Sectorisation allows us to isolate the sector without impacting supply to all other parts of the network.
- A large incident occurs on one of our HP pipelines. Sectorisation allows us to load shed an entire sector to reduce the load and maintain positive pressure to the remainder of the network.

We aim for all LP/MP/CBD/steel sectors to have a maximum of five isolation valves to minimise the response time in an emergency.

6.7.5.1 LP/MP Sectorisation

Only six of our subnetworks have more than 5,000 customers. These are the only subnetworks on which this strategy has an impact. Porirua subnetwork was deemed already compliant without requiring any capital works; Wellington subnetwork capital works have been completed since the 2020 AMP; and the remaining four require capital works as per Table 6.17.

Table 6.17: LP/MP sector plans

Subnetwork	Number of new valves required	Number of valves installed to date	Status
Porirua	0	N/A	Compliant
Wellington	13	13	Completed/compliant
Belmont	8	0	Underway
New Plymouth	10	4	Underway
Palmerston North	12	0	Planned
Hawke's Bay (Napier)	3	0	Underway

This programme of work is being carried out across a five-year period and will total approximately $400,000 to bring the remaining critical subnetworks up to our sectorisation requirements.

6.7.5.2 CBD Sectorisation

For CBDs in larger towns or cities, we will aim to maximise the number of customers per sector to 500. As these areas are often too meshed/interconnected to make sectorisation practical without many valves, which is both costly to install and difficult to quickly respond to in an emergency; installation of these valves is only carried out where practical. The installation of these valves allows parts of the CBD to remain operating, rather than shutting down the entire CBD.

6.7.5.3 Steel networks

Steel networks are also made to be isolatable in sectors of 500 customers, because of the difficulty in responding to leakage on steel pipelines (we cannot just squeeze off and bypass easily, such as with PE pipe networks). This minimises the impact of response, preventing the need to potentially shut down supply to the entire subnetwork.

6.7.5.4 Major Customers

This section of the isolation strategy is yet to be written, but the intention is to install valves in strategic locations that will allow us to isolate the bulk of our networks while maintaining supply to major customers during an emergency or large isolation/outage event. This will also create the ability to reinstate supply quicker to major customers during an entire sector/pressure system/network shutdown. This will be delivered as Phase 2 of the Network Isolation Strategy.

6.7.6 Expenditure

Table 6.18 shows the expenditure across our network isolation programme, with two isolation plan projects forecast during the planning period, and an expected $3.5 million of capital investment.

Table 6.18: Network isolation projects

Project description	Subnetwork	Delivery year	Description of works
IP Isolation Valves	Belmont	FY24 & FY27-FY30	Install two IP isolation valves on the Belmont HIP and eight on the Belmont LIP.
	Porirua	FY24 & FY26-FY38	Install six IP isolation valves on the Waitangirua LIP.
	New Plymouth	FY24	Install the final remaining valve on the New Plymouth IP.
	Palmerston North	FY29-FY30	Install two IP isolation valves on the Palmerston North LIP.
	Hawke's Bay	FY25-FY26	Install two IP isolation valves on the Hastings IP.
LP/MP Sector Valves	Belmont	FY25 & FY27	Install six valves in Lower Hutt and two valves in Upper Hutt.
	New Plymouth	FY24	Install six remaining valves to complete four sectors.
	Palmerston North	FY25 & FY26	Install 10 valves separating the east and west of Palmerston North LMP and two valves separating Kelvin Grove.
	Hastings	FY25	Install three valves to split Napier LMP into two sectors.
Isolation Strategy - Phase 2	All	FY26-FY30	Install strategic valves to bring more security to our major customers ($1 million).

6.8 Network Rationalisation Strategy

Powerco has accumulated networks throughout its corporate history. Accordingly, we have inherited different design philosophies and practices. The old way of thinking often involved replacing assets like-for-like without assessing other options. To ensure network designs are efficient and consistent, rationalisation strategies have been developed for each region.

Rationalisation highlights:

- Our major rationalisation projects for Wainuiomata, Kelson/Avalon/Belmont, Upper Hutt, Wallaceville and Palmerston North East have been completed in the past three years, reducing the amount of operational investment required to maintain these networks into the future.
- We have planned three additional minor rationalisation projects in Palmerston North West, with construction planned for 2026. These three projects have an expected capital expenditure of $150,000.
- More rationalisation opportunities may arise as assets in other subsystems require renewal.

6.8.1 Network Rationalisation Strategy objectives

This strategy aims to find and optimise efficiencies in our network. When an asset renewal or network project is identified via other primary drivers (asset class renewal, network strategy non-compliance), we undertake a network rationalisation assessment to see if there are other assets/issues on the network in need of remediation, and whether the network can be made more efficient, resulting in an overall optimised network. The result is a reduction in average annual costs over the lifespan of the assets, compared with a do-nothing/like-for-like asset replacement option. Additionally, project delivery efficiencies are gained with all the required works for a pressure system designed, constructed, and delivered at the same time.

Some benefits from network rationalisation include:

- Reduction/replacement of assets that have high operational expenditure (resulting in cost savings).
- Improvement in network capacity.
- Reduction of defects on the network.
- Reduction of safety risks on the network.
- Removal of high velocity and 'dead-leg' pipes.
- Enhancement to isolation capabilities.

Several combinations of options are compared with one another as well as against a 'do nothing' approach, resulting in a solution that provides the greatest benefit in alignment with our decision-making framework.

6.8.2 Network Rationalisation Strategy overview

A rationalisation concept study shall be commenced if some of the following criteria are met:

- Multiple DRS are near the end of their asset life.
- Defects exist on multiple DRS regulators.
- Safety risks have been identified across the network.
- A shortfall in capacity is forecast.

Before entering a rationalisation project into the TPK (Issues Register), the Asset Strategy team will undertake a concept study. A whole life discounted cashflow evaluation is prepared for several suitable rationalisation network configurations, with analysis based on Capex and Opex estimates.

6.8.3 Types of issues

The main types of rationalisation (efficiency) issues that occur are summarised in Table 6.19.

Table 6.19: Key network rationalisation risks

Specific threat	Specific cause	Solution
High operational costs	Too many regulator stations in one pressure system.	Optimise/minimise number and location of regulator stations.
Loss of capital and construction efficiencies	Performing several projects within one area in different years (higher cost, annoyance to public, repeated disturbance of other assets).	Concept study of entire subsystem. Collaboration with service delivery teams.

6.8.4 Expenditure

Table 6.20 shows the expenditure programme for rationalisation projects planned in the Manawatū and Horowhenua region (Palmerston North). Three projects are forecast during the planning period, with an investment of $150,000, for pressure regulator stations (PRS) that were due for renewal. Rather than replacing the stations, we will connect their downstream pressure systems to the larger Palmerston North LMP pressure system via mains interconnections. This will remove operational expenditure associated with these stations in the future once they are decommissioned.

Table: 6.20: Network rationalisation projects

Project description	Project region	Delivery year	Description of Works
Truscott Grove PRS	Manawatū and Horowhenua	FY26	Approximately 18 customers fed from this PRS will be interconnected into the larger Palmerston North LMP system.
Laurel Place PRS	Manawatū and Horowhenua	FY26	Approximately nine customers fed from this PRS will be interconnected into the larger Palmerston North LMP system.
Lewis Place PRS	Manawatū and Horowhenua	FY26	Approximately six customers fed from this PRS will be interconnected into the larger Palmerston North LMP system.

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7. Expenditure forecasts

7.1 Overview

This chapter provides a summary of our expenditure forecasts during the planning period. It is structured to align with our internal expenditure categories, and forecasts provided in earlier chapters and are presented here to provide a consolidated view of expenditure across the business. The expenditure profiles cover in-year forecasts for regulatory year 2023 and our forecasts for the 10-year AMP planning period from 1 October 2024 to 30 September 2033.

All figures are presented in constant prices, which means they exclude the allowance made for expected price inflation.

7.2 Forecast inputs and assumptions

This section describes the inputs and assumptions used to forecast our capital and operational expenditure.

Our forecasts rely on several inputs and assumptions, these include:

- Consumer connections
- System growth
- Asset replacement and renewal
- Asset relocation
- Quality of supply
- Other reliability, safety and environment
- Network Opex
- Non-network
- Escalation of costs

7.2.1 Consumer Connections

Consumer Connections is Capex associated with the connection of new customers to the network, or alterations to the connections of existing customers, where main extension is generally not required.

Assumptions used to forecast expenditure are:

- Volumes are based on anticipated projects, the mix and number of which reflect our current view of the level of economic and residential activity on our footprint. Our systems utilise a range of information about future growth assumptions. Economic forecasts, council forecasts, and detailed local development knowledge from our engineers and customer teams support appropriate forecasting in this area.
- Current contract rates have been used for costs per connection, escalated for inflation.
- A reduction in new residential connection numbers and low growth.
- Current expenditure for connections has been re-forecast to reflect a steady increase in capital contributions from RY23 to RY30, holding constant to RY33, to reduce the financial risk associated with stranded assets.

7.2.2 System growth

System growth Capex relates to the development or enhancement of the network.

Assumptions used to forecast expenditure are:

- Consideration of growth rates in all areas using council growth plans, growth factors considered in the consumer connections category, relationships with developers and historical uptake rates.
- Costs for reticulation of new subdivisions are based on historical averages, escalated for inflation.
- Estimates have been made for growing our network to reach renewable gas opportunities beginning in 2027 and increasing to the end of the planning period.

7.2.3 Asset replacement and renewal

Asset replacement and renewal costs relate to addressing the progressive deterioration of the condition of network assets. This includes replacement of existing assets where these assets have been identified as reaching end-of-life, or the assessed criteria for replacement has been reached. These include reactive replacements following technical failure or risks associated with age, condition, or obsolescence.

Assumptions used to forecast expenditure are:

- The use of standard asset lives as described in the Commerce Commission's 2022 reset of the gas default price-quality path (DPP) Input Methodologies. The final decision permitted gas distribution businesses (GDBs) to reduce the remaining lives of their network assets, enabling accelerated capital recovery aligned with the expected duration of natural gas conveyance. Consequently, the remaining lives of Powerco's network assets have been reduced by 31% (from a projected average of 24.98 years to 17.32 years in 2023), to mitigate the increased risk of economic stranding.
- The cost of replacement reflects our current unit rates, escalated for inflation, and reflects localised impacts for some of our more remote areas. Powerco's planning defect identification and analysis processes and data provide a good basis for future volumes.
- Operational forecasts are based on historical trends and current rates, escalated for inflation.

7.2.4 Asset relocation

Asset relocation is Capex associated with the need to move assets because of third-party requests. Asset relocation mainly includes new pipe (or stations) constructed as part of route realignment because of a third-party request, such as road widening.

Assumptions used to forecast expenditure are:

- Volumes have been based on historical levels of relocation.
- The cost of relocation represents our current cost base, escalated for inflation.
- Our engineers and customer teams maintain a watching brief regarding emerging relocation requirements.
- Where major works in excess of our forecasts are known, these are factored into our forecasts.

7.2.5 Quality of supply

Quality of supply Capex is focused on ensuring we provide sufficient capacity and pressure where networks are, or may become, constrained because of unforeseen demand growth (i.e., infill, cold weather, unforeseen commercial activities, etc.). These projects look at current network pressure performance and network configuration to ensure that our networks are both capable of delivering required demand and acceptable pressures and are constructed in the most efficient manner possible.

Assumptions used to forecast expenditure are:

- This category of investment relates to portfolios of projects covering specific, targeted enhancement areas.
- The costs of specific projects and programmes are based on our recent experience in managing similar types of initiatives.
- Powerco's scale has enabled it to develop a strong information and business projects capability.
- This capability provides us with confidence in both forecasting delivery risk and our ability to manage that risk.

7.2.6 Other reliability, safety and environment

Reliability, safety and environment Capex is focused on maintaining or improving the safety of the network for the public, employees, and contractors. These projects are designed to improve reliability, security of supply or service standards, and are required to meet environmental standards.

Assumptions used to forecast expenditure are:

- This category of investment relates to portfolios of projects covering specific, targeted enhancement areas.
- The costs of specific projects and programmes are based on our recent experience in managing similar types of initiatives.
- Powerco's scale has enabled it to develop a strong information and business projects capability.
- This capability provides us with confidence in both forecasting delivery risk and our ability to manage that risk.

7.2.7 Network Opex

Network Opex is focused on the maintenance and inspections costs required to ensure safe operation of the gas distribution network.

Assumptions used to forecast expenditure are:

- Forecasts are based on current rates adjusted by an increase in network size (based on historical trends).
- Includes all work to survey and maintain the assets to achieve their original design lives and service potential.

7.2.8 Non-network (Capex and Opex)

Non-network asset investment is required to enable the wider Asset Management Plan and support the operation of the Gas business. It includes information and communications technology (ICT) and other non-network assets, such as office facilities and leases.

Assumptions used to forecast expenditure are:

- Forecasts assume an allocation for investment in core Asset Management Systems, discussed in the Electricity AMP, that will benefit gas in the longer term by providing tools, systems and facilities that would be too onerous for gas only.
- These improvements translate into improved cost outcomes for gas customers. We will continue to refine the scope and cost of these allocations to ensure targeted benefits can be delivered.

Specific details regarding our approach to non-network assets and our specific assumptions in this area are provided in Chapter 4.

7.2.9 Escalation of costs

We have assumed that the published NZIER inflation forecast (as of June 2023) provides an appropriate basis for adjusting our forecasts into nominal dollars.

Table 7.1: Consumers price index (CPI) forecasts used to produce the expenditure forecasts

Year to	2024	2025	2026	2027	2028
End September	3.14%	2.01%	2.13%	1.88%	2.00%

Expenditure profiles and allowances

The Capex and Opex forecasts reflect our best current information regarding future network use having engaged with customers to predict customer connections and consumption trends. Allowances have also been made for managing risk associated with climate adaptation, resilience, and enabling the distribution of renewable gases. This information has been used to prepare our base case scenario.

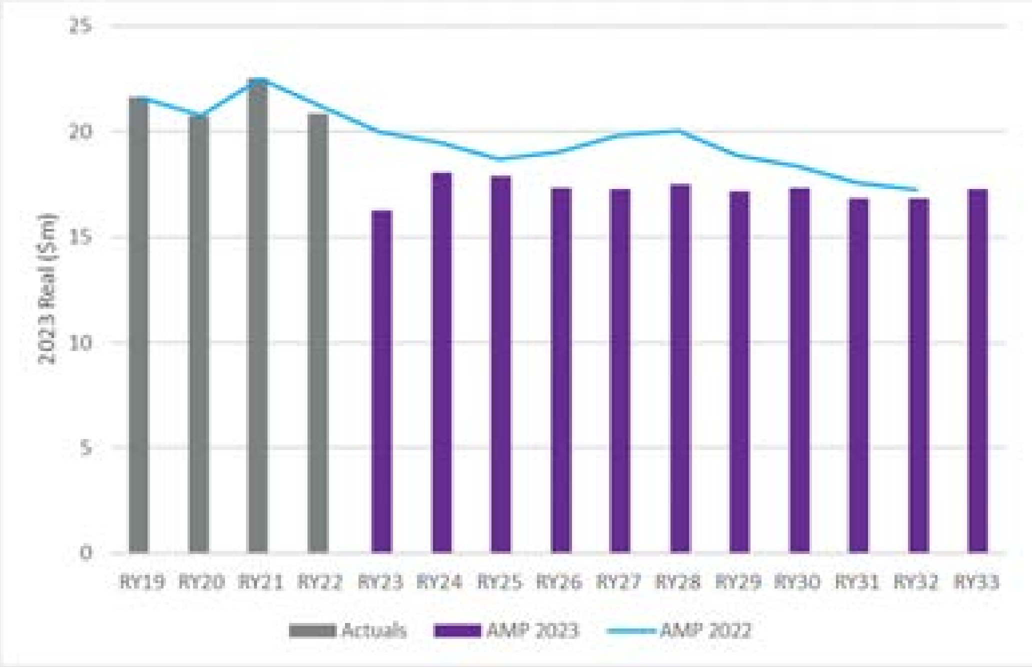
To help inform our stakeholders of the challenges, opportunities, and future planning needs, Chapter 2 'External forces shaping our network' summarises the main external factors that impact our operating environment.

Expenditure forecasts in this section have been developed using a base-step-trend methodology. The specific work to be completed, detailed in Chapters 5 and 6, is used to define the baseline, with the operating context (Chapters 2 and 4) used to assess if a step change in expenditure is needed. Predictive forecasting techniques are used to estimate work volumes that are applied to associated unit rates.

7.3 Network capital expenditure

Our forecast for total Capex across the 10-year AMP period shows a reduction in investment during the period compared with the Gas 2022 AMP Update. The decrease is driven by a reduction in new residential connection numbers and a linear increase in capital contributions across the period to offset the risk of stranding assets. Changes to our expenditure profile are also reflective of our transition away from a growth strategy to a prudent focus on maintaining our customer base under the changing operating environment. A conservative allowance has been included to enable our renewable pathway, adaptation, and resilience planning for the future. The forecast capital expenditure is shown in Figure 7.1 and Figure 7.2.

Figure 7.1: Capex expenditure forecast (constant $)

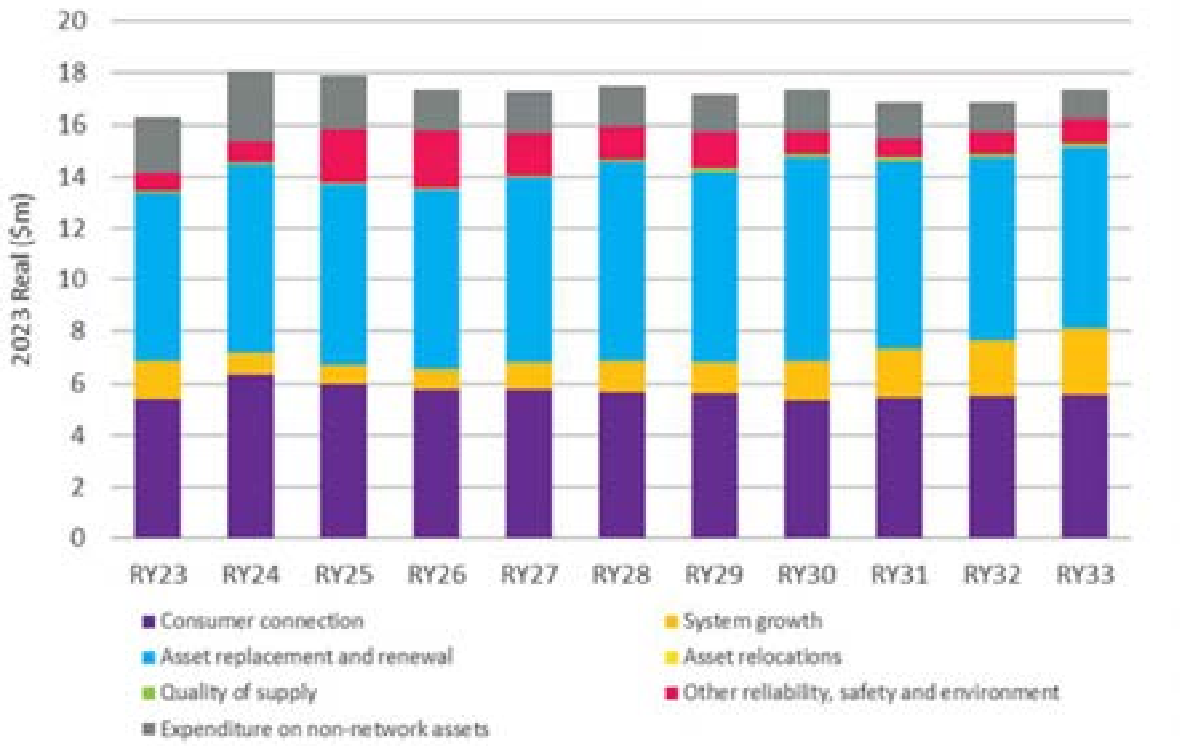


Total Capex includes the following expenditure categories:

- Consumer connections
- System growth
- Asset replacement and renewal

- Asset relocation
- Quality of supply
- Other reliability, safety and environment
- Non-network assets

Figure 7.2: Capex expenditure forecast by category (constant $)



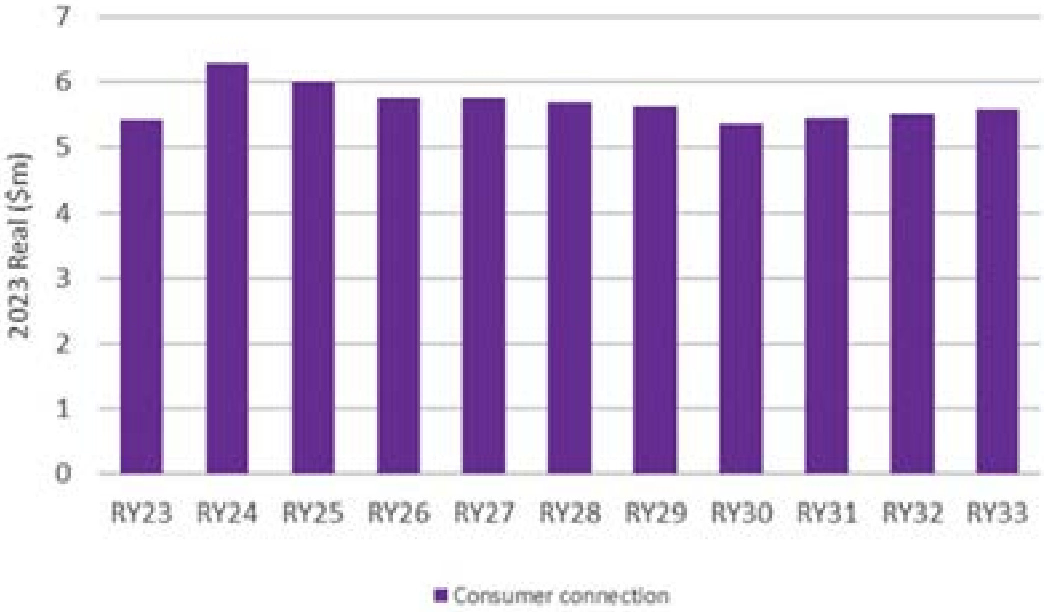
7.3.1 Consumer Connection

Consumer Connection is Capex primarily associated with the connection of new customers to the network, or alterations to the connections of existing customers, where main extension is generally not required. Forecast Consumer connection Capex is shown in Figure 7.3.

Given the pathway towards a low carbon future is focused on a transition to biogas and hydrogen, the projected expenditure results in a lower consistent growth trend and a reduction in forecast expenditure across the period. The reasons for the forecast trend in expenditure are:

- A reduction in new residential connections aligned to historical averages before the 2018-19 new housing boom and COVID-19, predicting gas volumes will slow down.
- The forecast reflects an increase in capital contributions from RY23 to RY26, with further increases over the following regulatory period, holding steady to RY33. This is to offset the stranding risk of our assets.

Figure 7.3: Consumer connection Capex



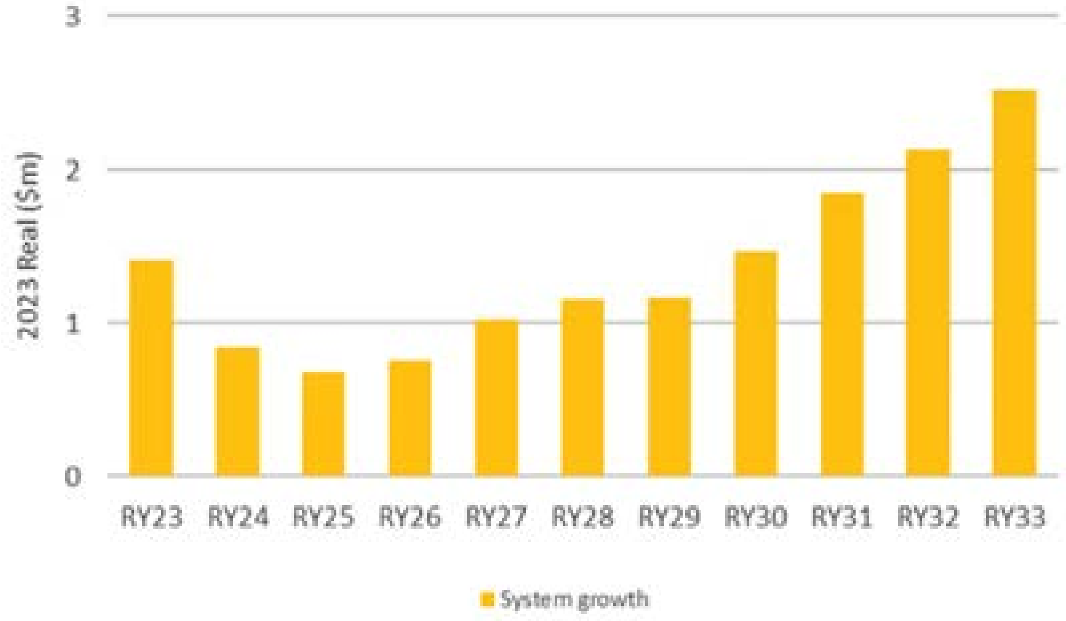
7.3.2 System growth

System growth Capex relates to the development or enhancement of the network. This category is for work driven by growth in network load (mainly through residential developments), which requires an increase in network capacity via network upgrade or mains extension to connect to new customers or other opportunities. Forecast system growth Capex is shown in Figure 7.4.

The projected expenditure forecast decreases over the current DPP (RY23 to RY26), before increasing into the latter part of the 10-year AMP period. The reasons for the forecast trend in expenditure are:

- Our forecasts for the number of residential subdivision developments we connect to have reduced in line with the reduction in consumer connection expenditure forecasts.
- The forecast reflects an increase in capital contributions proportional to that seen in consumer connection expenditure forecasts.
- Offsetting some of these reductions, we anticipate increasing investment opportunities to expand our network to reach renewable gas opportunities from the beginning of RY27, steadily increasing to the end of the planning period.

Figure 7.4: System growth Capex



7.3.3 Asset replacement and renewal

Asset replacement and renewal Capex relates to addressing the progressive deterioration of the condition of network assets. This may include replacement of existing assets where these assets have been identified as reaching their assessed criteria for replacement. These include reactive replacements following technical failure or risks associated with age, condition, or obsolescence. Forecast asset replacement and renewal Capex is shown in Figure 7.5.

We have forecast an increase to the asset replacement and renewal programmes across the 10-year AMP period. The reasons for the forecast trend in expenditure are:

- Specific tranches of work that include the replacement of pre-85 pipes, steel pipe renewal and removal, plug valves, renewal of ageing regulator stations, replacement of our fleet of pressure loggers, and the renewal of cathodic protection systems (CPS). This is discussed in Chapter 5.
- Increased investment in our asset replacement and renewal forecast across the period has allowed for investment related to climate mitigation, adaptation, and resilience plans, such as the relocation of pipe on bridge crossings or holding spares etc. This will support any resilience work required for strategic assets as well as improving our network leakage to reduce emissions from network losses.

Figure 7.5: Asset replacement and renewal Capex

7.3.4 Asset relocation

Asset relocation is Capex associated with the need to move assets because of third-party requests. Such requests mostly include new pipe constructed as part of route realignment because of a third-party request, such as road widening. Forecast asset relocation Capex is shown in Figure 7.6.

The projected expenditure required for asset relocation remains steady in line with historical forecasts. The reasons for the forecast trend in expenditure are:

- While we have seen high volatility in the level of relocation required over time, several years' worth of historical expenditure allows us to forecast an average level of asset relocation of approximately $120,000 per annum (of which 70% is funded by capital contribution by the third party requesting the relocation). Therefore, we forecast approximately $35,000 per annum (net of capital contribution).

Figure 7.6: Asset relocation Capex

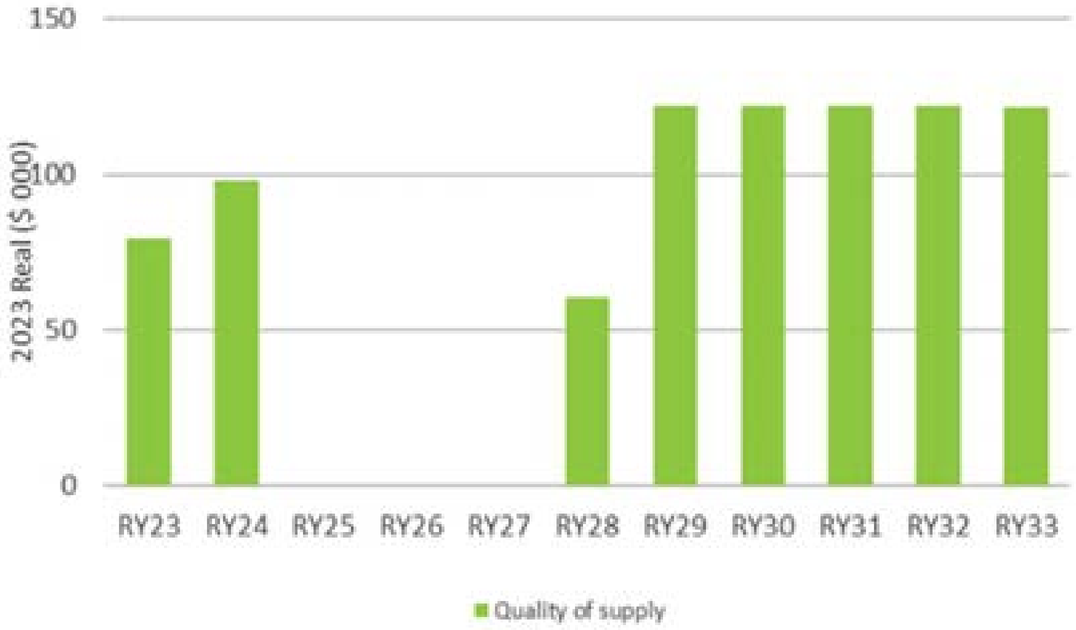
7.3.5 Quality of supply

Quality of supply Capex is focused on ensuring we provide sufficient capacity and pressure within our network. Most of the quality of supply expenditure is related to networks with existing pressure constraints unrelated to growth, or networks that have, or are expected to, become constrained over time because of slow, organic growth in demand unaccounted for in our growth plans and system growth (GRO) planning forecasts. Forecast quality of supply Capex is shown in Figure 7.7.

Except for no forecast expenditure between RY25 and RY27, where our network modelling indicates no reinforcement projects will be required, a minimal and steady forecast for quality of supply is forecast for the remainder of the 10-year AMP period. The reasons for the forecast trend in expenditure are:

- In the past decade we have completed some major projects bringing the majority of our networks up to capacity specification (i.e. Wellington CDB capacity upgrade).
- Most of our supply upgrades in the AMP period are for expected constraints because of network growth (GRO), rather than existing network issues.
- Connection to renewable gas supplies could remove/reduce the need for network upgrades where the supply point could be introduced at the constrained extremity of a pressure system.
- A future growth provision to account for networks that reach capacity by infill, or existing commercial customers increasing consumption; or colder weather resulting in increased demand and making network weak points more apparent through our pressure monitoring programme.

Figure 7.7: Quality of supply Capex



7.3.6 Other reliability, safety and environment

Reliability, safety and environment Capex is focused on maintaining or improving the safety of the network for the public, employees, and contractors. These projects are designed to improve reliability, security of supply or service standards, and are required to meet environmental standards. Forecast reliability, safety and environment Capex is shown in Figure 7.8.

The projected expenditure required increases in RY25 and RY26 based on need, then reduces for the remainder of the 10-year AMP period. The reasons for the forecast trend in expenditure are:

- We have incorporated expenditure to enable us to deliver targeted asset specific investment programmes, such as emergency isolation valves and rationalisations projects, focused on reliability and improved public safety.
- Increased expenditure in RY25 and RY26 as we install some strategic intermediate pressure (IP) valves as part of our IP isolation plans (Chapter 6, section 6.7.4)
- Increased investment from RY26 to RY29 as we deliver Phase 2 of our isolation strategy (major customers).
- Investment decrease from RY30 as we complete our sectorisation plans (Chapter 6, section 6.7).
- Our recent focus in this area has resulted in progressive identification of valuable enhancement initiatives, and we have set overall future expenditure to reflect this trend.

Figure 7.8: Other reliability, safety and environment Capex

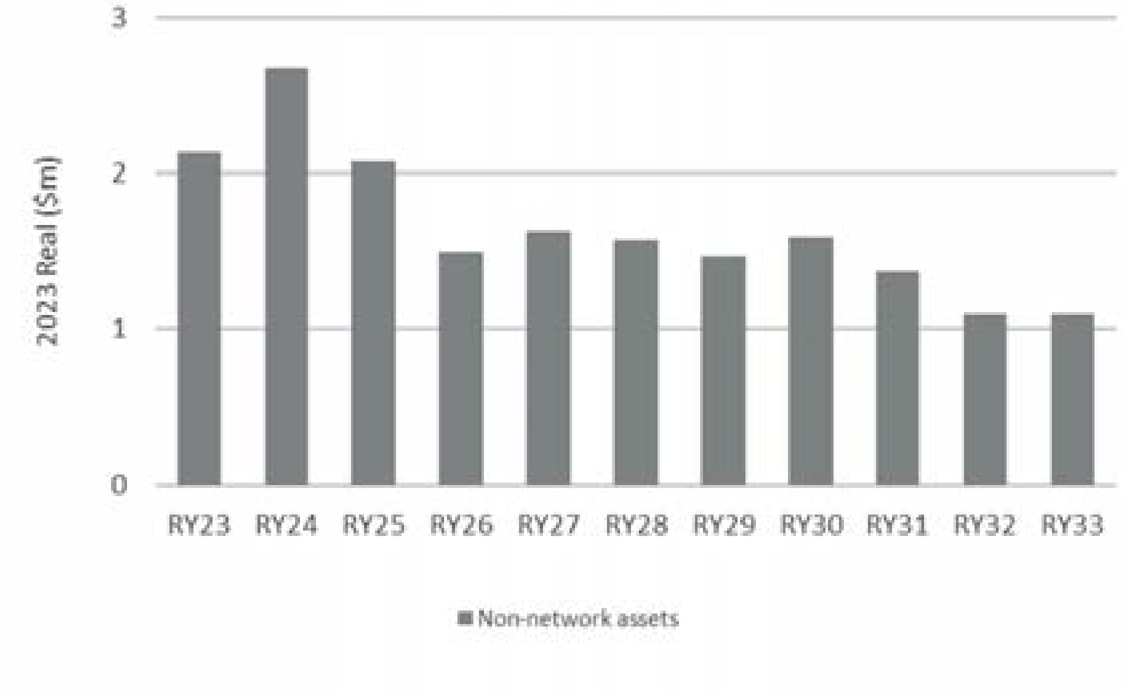
7.3.7 Non-network assets

Non-network assets Capex is all costs associated with information and communication technology (ICT), facilities, and leases that support the operation of the gas business. We plan to spend approximately $2.1m on non-network assets in RY23, and 9% of total Capex over the entire AMP planning period. Forecast non-network assets Capex is shown in Figure 7.9.

The projected expenditure required increases in RY24 before decreasing across the remainder of the planning period. The reasons for the forecast trend in expenditure are:

- Facilities and lease investment profiles remain relatively unchanged across the period.
- We plan continued investment in ICT Capex between RY23 to RY25 to extend our Enterprise Resource Planning (ERP) foundation using SAP, and complete an upgrade to our geographic information system (GIS).
- With the ongoing increase in investment in our Powerco electricity network, its Regulated Asset Base (RAB) is expected to grow across the period. As ICT costs will not increase at the same rate, the allocation, as well as expected efficiency gains in ICT support costs (e.g. software licences etc), see a decrease in forecast Capex from RY26.

Figure 7.9: Non-network assets Capex



7.4 Operational expenditure

The projected expenditure profile of operational expenditure remains steady over the 10-year period, such that annual operational expenditure slightly increases towards the end of the AMP period compared with the first year. This reflects the projected growth of our network and business.

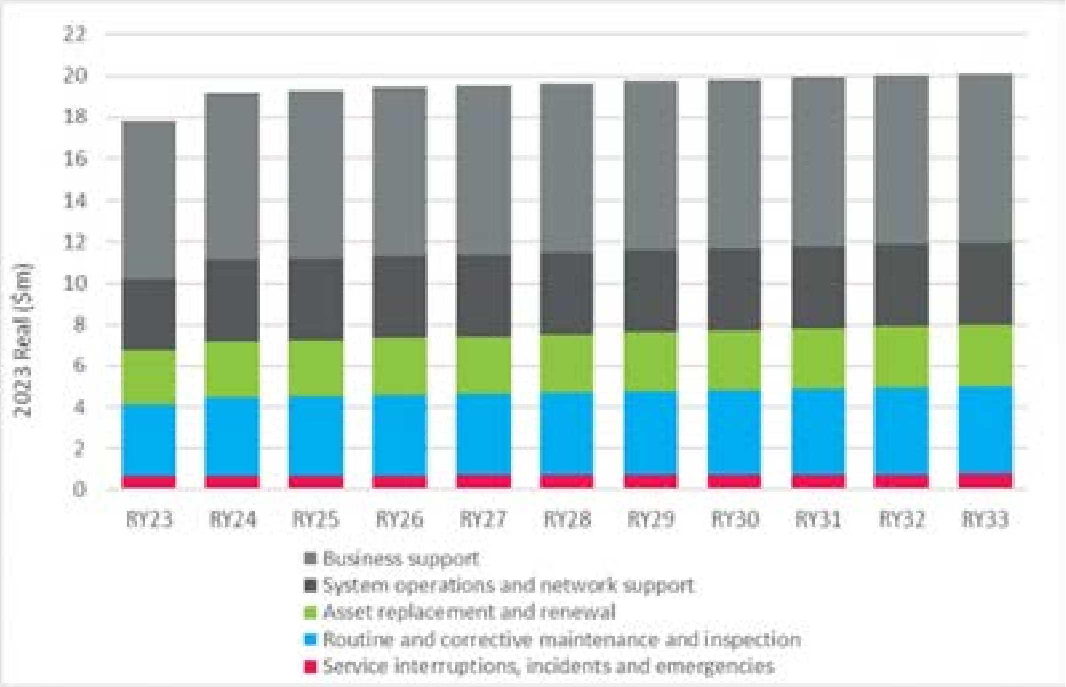
The projected expenditure profile of operational expenditure shows a stable trend over the 10-year period in alignment with the Gas 2022 AMP Update that is relative to actual spend since RY22. The forecast operational expenditure is shown in Figure 7.10 and Figure 7.11.

Figure 7.10: Opex expenditure forecast (constant $)

Total Opex includes the following expenditure categories:

- Service interruptions, incidents and emergencies
- Routine and corrective maintenance and inspection
- Asset replacement and renewal
- System operations and network support
- Business support

Figure 7.11: Opex expenditure forecast by category (constant $)



7.4.1 Service interruptions, incidents and emergencies

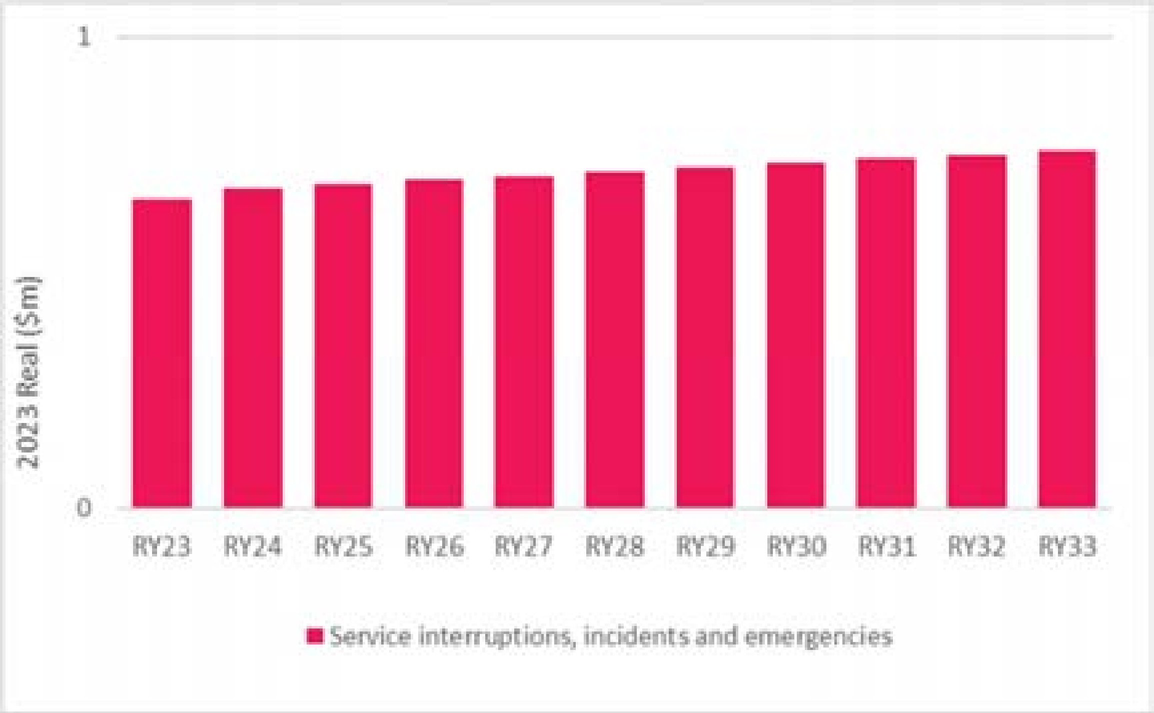
Service interruption (faults) and emergency maintenance work is completed as needed in response to supply interruptions, major leakage, or public reported escapes, and generally comprises callouts to restore supply or to make the network safe. This category includes the expenses related to our third-party damage (TPD) prevention programme. Work comprises activities undertaken by field personnel responding to a reported failure of the network, including any back-up assistance needed at the time to restore supply or make the network safe. Forecast service interruptions, incidents and emergencies Opex is shown in Figure 7.12.

The work can be either temporary or permanent. Where follow-up work is needed, it is deemed to be corrective. Our fault response capability is measured by the response to emergency time and is closely monitored.

The projected expenditure required for service interruptions, incidents and emergencies remains steady across the 10-year period. The reasons for the forecast trend in expenditure are:

- Volumes of faults are determined based on historical trends. Unit rate forecasts are our current cost basis, escalated for a growing network and inflation, and include consideration of local conditions.
- Powerco has a well-developed understanding of the requirements to respond to emergencies and ensure safety of the public and customers around our network.

Figure 7.12: Service interruptions, incidents and emergencies Opex



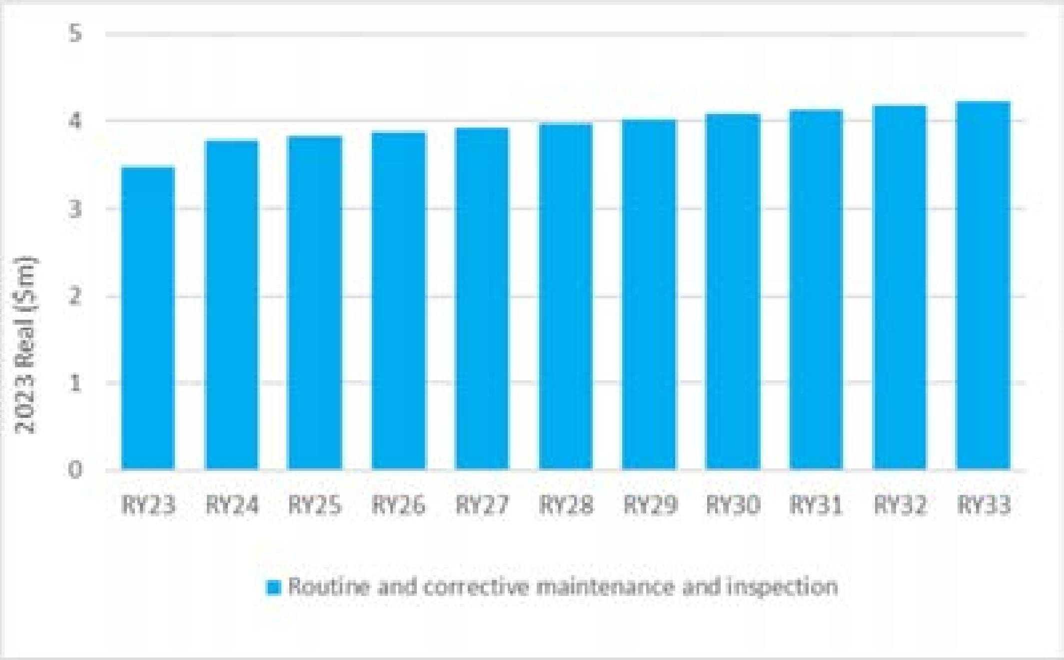
7.4.2 Routine and corrective maintenance and inspection

Routine and corrective maintenance and inspection Opex is driven by pre-planned work schedules. It comprises network inspections and routine servicing of equipment, as well as repair of defective equipment in accordance with the annual maintenance plan. This expenditure category also includes non-routine maintenance, such as relocations of rotatable assets. Most of our routine and inspection maintenance programme is driven by legislation and industry standards. Forecast routine and corrective maintenance and inspection Opex is shown in Figure 7.13.

The projected expenditure required for routine and corrective maintenance and inspection increases across the 10-year period. The reasons for the forecast trend in expenditure are:

- Forecast increase in leak events (found through new survey) will be offset by reduction in public reported leaks.
- Category includes preventative maintenance activities, such as plan issue, location of pipes and stand-overs.
- Unit rate forecasts represent our current cost base, escalated for network growth and inflation, and include consideration of local cost influences.

Figure 7.13: Routine and corrective maintenance and inspection Opex



7.4.3 Asset replacement and renewal

Asset replacement and renewal maintenance Opex is driven by the maintenance of asset integrity to address the progressive deterioration or obsolescence of assets, or the need to maintain physical security. Because there is a potential cross-over of this expenditure and corrective maintenance expenditure, Powerco interprets asset replacement and renewal maintenance to include non-routine defect remediation, which requires the replacement of a capitalised asset or subcomponent. This category contains all the replacement and renewal jobs that cannot be capitalised. The cost for each individual activity is low (under $500). Conversely, corrective maintenance includes renewal of subcomponents or parts, which are not part of our capitalisation policy and the value of which is inferior to a certain threshold. Forecast asset replacement and renewal Opex is shown in Figure 7.14.

The projected expenditure required for asset replacement and renewal increases across the 10-year period. The reasons for the forecast trend in expenditure are:

- It reflects the increase in actual expenditure in previous years, and the forecast of improvement in tracing network leaks through new survey systems.
- Volumes have been determined based on network age and condition.
- Unit rate forecasts are based on historical works escalated for inflation.
- Powerco’s planning defect identification and analysis processes and data provide a good basis for future volumes.

Figure 7.14: Asset replacement and renewal Opex

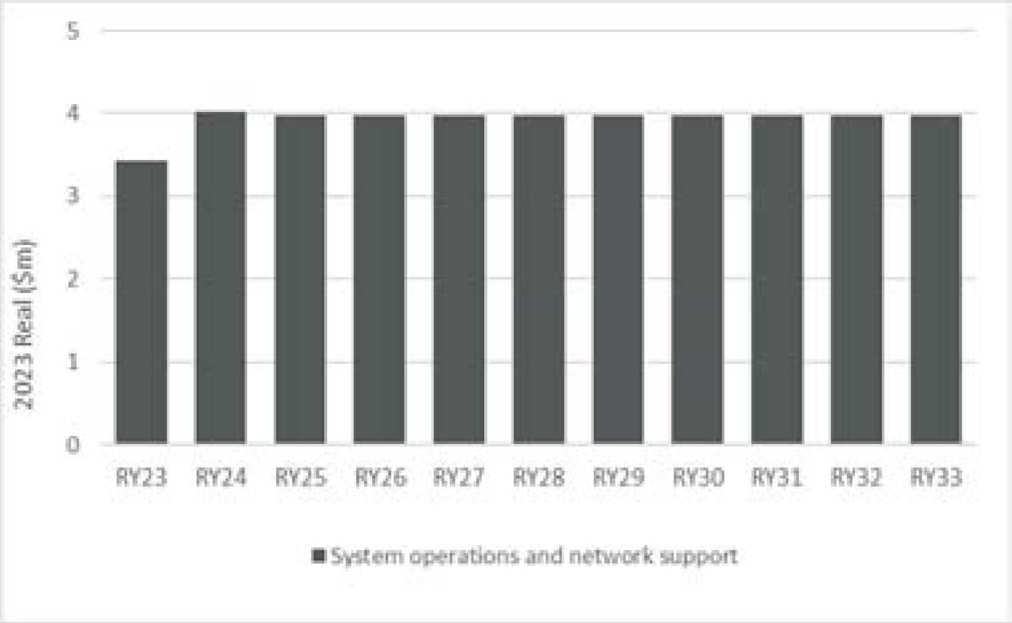
7.4.4 System operations and network support

System operations and network support expenditure includes the direct costs associated with managing the network. These include network planning process expenses, such as people costs associated with the Asset Strategy and Operations teams, the non-capitalisable portion of the service provider relationship management process (contract and project management), and network operations expenses. The expenditure also includes management costs not directly associated with creating network assets, such as the costs for customer management, network planning and network operation. These costs include site service charges, network insurance premiums and charter payments, and may include the costs of decommissioning existing assets (where a new asset has not been created). Forecast systems operations and network support Opex is shown in Figure 7.15.

The projected expenditure required for system operations and network support has reduced in RY23. However, the forecast increases from RY24 and remains steady for the remainder of the period. The reasons for the forecast trend in expenditure are:

- Expenditure reduced in RY23 because of the reallocation of customer team resource from the gas business to shared business support.
- Increased expenditure from RY24 related to digital solutions, including cloud services and corporate functions, such as finance, legal and regulatory shared costs allocated to the gas business.

Figure 7.15: System operations and network support Opex



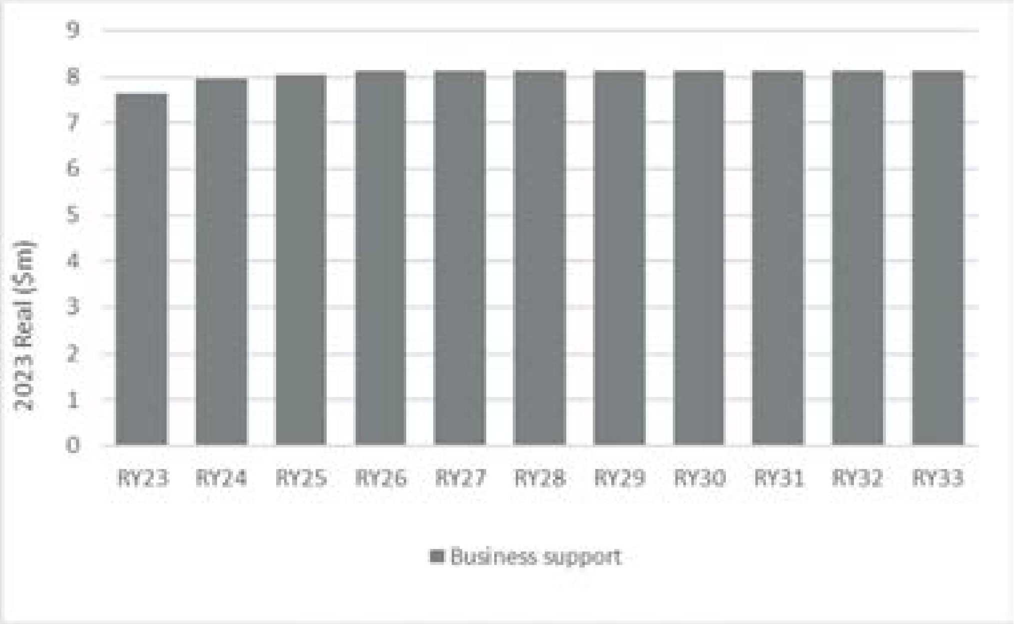
7.4.5 Business support

Business support costs are the allocation of Powerco's corporate support activities relating to its centralised corporate functions. Key functions provided for include finance, legal, audit and compliance, pricing, human resources, health and safety, corporate communications, information services, business projects, and general administration. Powerco has well-established functions in these areas, providing effective corporate oversight and management. Forecast business support Opex is shown in Figure 7.16.

The projected expenditure required for business support has increased slightly during the 10-year planning period. The reasons for the forecast trend in expenditure are:

- Business support expenditure has been forecast proportionally against the cost allocation with our Electricity division, and increases over the period in relation to the implementation of digital solutions, including cloud services and corporate function requirements.

Figure 7.16: Business support Opex



Expenditure plan summary and network maps

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Wellington 184

Hutt Valley and Porirua 185

Manawatū 186

Taranaki 187

Hawke’s Bay 187

8. Expenditure plan summary

Below are the accompanying tables for the network maps in Appendix 6. There is a table for each region, and each entry pertains to a separate map.

The following data is accurate to the end of June 2023 (01/07/2023).

The criteria for the projects shown on each map are:

- Only Opex/Capex projects (no feasibility).
- Total cost (design and construct) must be greater than or equal to $60,000.
- Status is approved – not in parked (all Gas Works Plan projects approved).

The criteria for the subdivisions to be included in the maps are:

- Model = Wellington, Belmont, Porirua, Palmerston North, New Plymouth, Hastings.
- Total >= 100 lots (greater than or equal to 100 lots).

8.1 Wellington

Item	Work type	Driver	Asset Management Strategy	Project	Delivery target	Delivery budget
1	ARR	Reliability	DRS	Taylor Preston DRS renewal/removal	2024	$250,000
2	ARR	Safety	DRS	Middleton DRS renewal	2024	$400,000
3	ARR	Safety	DRS	Simla Crescent DRS renewal	2024	$150,000
4	ARR	Reliability	DRS	Wilton DRS regulator replacement	2024	$80,000
5	ARR	Reliability	DRS	Ohiro DRS regulator replacement	2024	$80,000
6	ARR	Reliability	DRS	Burma Road DRS renewal	2025	$60,000
7	ORS	Safety	Network Isolation	John Sims Drive – IP isolation valve	2026	$250,000
8	GRO	Partnership	Network Growth	Churton Park	TBC	TBC
9	GRO	Partnership	Network Growth	Grenada	TBC	TBC
10	GRO	Partnership	Network Growth	Woodridge	TBC	TBC
11	GRO	Partnership	Network Growth	Newlands	TBC	TBC
12	GRO	Partnership	Network Growth	Huntleigh	TBC	TBC
13	GRO	Partnership	Network Growth	Crofton Downs	TBC	TBC

8.2 Hutt Valley and Porirua

Item	Work type	Driver	Asset Management Strategy	Project	Delivery target	Delivery budget
1	ARR	Reliability	Mains & Services	Waddington Drive pre-85 replacement	2024	$200,000
2	ARR	Reliability	Mains & Services	Harbour View Road pre-85 replacement	2024	$150,000
3	ARR	Reliability	Mains & Services	Stanhope Grove pre-85 replacement	2024	$300,000
4	ARR	Reliability	Mains & Services	Ōmāpere Street pre-85 replacement	2024	$110,000
5	ARR	Reliability	Mains & Services	Hutt Road/Gear Street/Petone Avenue/Jackson Street pre-85 renewal	2025	$906,843
6	ARR	Safety	Mains & Services	Bedford Court LIP removal	2024	$100,000
7	ARR	Reliability	Mains & Services	Hartham Place South – steel replacement	2025	$98,017
8	ARR	Reliability	DRS	Metro Glasstech PRS renewal	2024	$165,000
9	ARR	Reliability	DRS	34-36 Dragon Street regulator upgrade	2024	$150,000
10	ARR	Reliability	DRS	Awarua Street DRS renewal	2028	$315,000
11	ARR	Reliability	DRS	Onepoto DRS renewal	2027	$360,000
12	ARR	Reliability	DRS	Maungaraki DRS renewal	2026	$315,000
13	ARR	Reliability	DRS	Sunrise Boulevard DRS renewal	2027	$215,000
14	ARR	Delivery	DRS	Hutt Road South DRS renewals	2027	$215,000
15	ARR	Reliability	DRS	Eastern Hutt upgrade	2026	$850,000
16	ARR	Delivery	Line & Service Valves	Belmont HIP valve replacement	2024	$700,000
17	ARR	Safety	Line & Service Valves	LIP valve replacement – Warspite Avenue	2024	$150,000
18	ARR	Safety	Line & Service Valves	LIP valve replacement – Mohuia Crescent	2025	$90,000
19	ARR	Reliability	Special Crossings	Waione Street Bridge corrosion and bracket replacement	2024	$300,000
20	ARR	Safety	Special Crossings	Whites Line East MP special crossing upgrade	2024	$300,000
21	ORS	Delivery	Special Crossings	South Beach Road LMP bridge crossing upgrade	2024	$200,000
Whole Area	ARR	Safety	CPS - Cathodic Protection System	HVP CP Renewal and upgrade - Upper Hutt	2024	$300,000
Whole Area	ARR	Safety	CPS - Cathodic Protection System	HVP CP renewal and upgrade – Lower Hutt	2025	$312,000
22	GRO	Growth	Pressure Droop	Wainuiomata IP capacity upgrade	2028	$1,178,896
23	ORS	Safety	Network Isolation	IP isolation valve – Awamutu Grove	2027	$250,000
24	ORS	Safety	Network Isolation	IP isolation valve – McLeod Street	2027	$250,000
25	ORS	Safety	Network Isolation	IP isolation valve – Whakatiki Street	2028	$250,000
26	ORS	Safety	Network Isolation	IP isolation valve – Semple Street	2029	$250,000

Item	Work type	Driver	Asset Management Strategy	Project	Delivery target	Delivery budget
27	ORS	Safety	Network Isolation	Dowse Drive – IP isolation valve	2030	$250,000
28	ARR	Reliability	Network Isolation	Omapere Street Cocon IP isolation valve renewal	2024	$250,000
29	GRO	Partnership	Network Growth	Hartford Crescent (Upper Hutt)	TBC	TBC
30	GRO	Partnership	Network Growth	Wallaceville (Upper Hutt)	TBC	TBC
31	GRO	Partnership	Network Growth	Arakura/Trelawny (Wainuiomata)	TBC	TBC
32	GRO	Partnership	Network Growth	Kaitangata Crescent (Kelson)	TBC	TBC
33	GRO	Partnership	Network Growth	Jamaica Drive (Grenada North)	TBC	TBC
34	GRO	Partnership	Network Growth	Kenepuru (Porirua)	TBC	TBC
35	GRO	Partnership	Network Growth	Takapūwāhia (Porirua)	TBC	TBC
36	GRO	Partnership	Network Growth	Aotea (Porirua)	TBC	TBC
37	GRO	Partnership	Network Growth	Plimmerton Farm (Porirua)	TBC	TBC

8.3 Manawatū

Item	Work type	Driver	Asset Management Strategy	Project	Delivery target	Delivery budget
Off Map	ARR	Safety	Mains & Services	Feilding-Sanson HMP signage	2024	$60,000
Off Map	ORS	Safety	Mains & Services	Kohinui Road mains decommissioning	2025	$60,000
Off Map	ARR	Safety	Mains & Services	Oroua Downs pre-85 renewal	2025	$963,900
Off Map	ARR	Reliability	DRS	Kākāriki DRS renewal	2024	$200,000
Off Map	ARR	Reliability	DRS	Pahiatua DRS renewal	2025	$115,000
Off Map	ARR	Reliability	DRS	Levin Gas Gate renewal	2024	$200,000
1	QOS	Reliability	Pressure Droop	Amberley Avenue DRS outlet overlay	2025	$100,000
2	GRO	Delivery	Pressure Droop	Queen Street East overlay	2025	$360,000
3	ARR	Reliability	Network Isolation	PN MP steel isolation improvement – Havelock Ave - Stage 1	2024	$65,000
4	ORS	Safety	Rationalisation	Laurel Place PRS rationalisation	2025	$69,012
5	ORS	Reliability	Rationalisation	Lewis Place PRS rationalisation	2025	$66,844
6	GRO	Partnership	Network Growth	Whakarongo/Freedom Drive	TBC	TBC
7	GRO	Partnership	Network Growth	Summerhill	TBC	TBC
8	GRO	Partnership	Network Growth	Hokowhitu/Centennial Drive	TBC	TBC

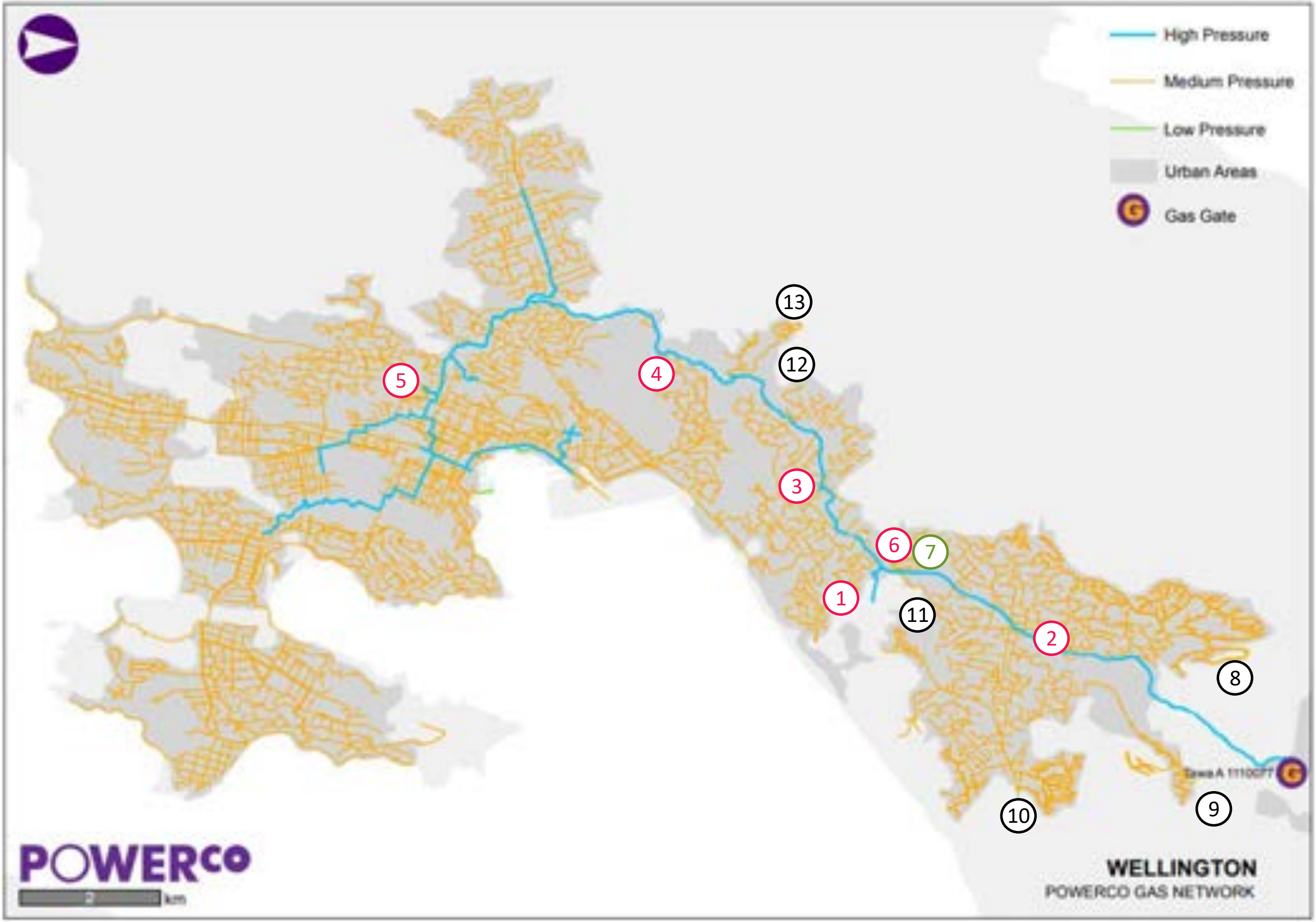
8.4 Taranaki

Item	Work type	Driver	Asset Management Strategy	Project	Delivery target	Delivery budget
Off Map	ORS	Safety	DRS	Hāwera Gas Gate pipework	2024	$60,000
Off Map	ARR	Safety	Line & Service Valves	Fonterra Hāwera – HIP isolation valve	2025	$250,000
Off Map	ARR	Safety	Special Crossings	Cardiff Road bridge crossing renewal	2024	$100,000
Off Map	ARR	Reliability	Special Crossings	Corroded Lepperton special crossing support renewal	2026	$80,000
Off Map	ARR	Reliability	Special Crossings	Normanby Road Manaia crossing coating renewal	2026	$100,000
Whole Area	ARR	Safety	CPS – Cathodic Protection System	TAR CP renewal and upgrade - New Plymouth	2026	$287,000
Whole Area	ARR	Safety	CPS – Cathodic Protection System	TAR CP renewal and upgrade - Hāwera	2027	$171,000
1	GRO	Growth	Pressure Droop	Hutchen Place reinforcement	2024	$100,000
Whole Area	ORS	Safety	Network Isolation	South New Plymouth sector valves	2024	$150,000
2	ARR	Safety	Network Isolation	Wynyard Street – IP isolation valve	2024	$137,837
3	GRO	Partnership	Network Growth	Bell Block-Airport Drive and Willis Road	TBC	TBC
4	GRO	Partnership	Network Growth	Mangorei Road	TBC	TBC
5	GRO	Partnership	Network Growth	Fernbrook Drive	TBC	TBC

8.5 Hawke’s Bay

Item	Work type	Driver	Asset Management Strategy	Project	Delivery target	Delivery budget
1	ORS	Reliability	Mains & Services	Frimley Road pre-85 ring main extension	2025	$160,031
2	ARR	Safety	Special Crossings	Ngaruroro Bridge bracket replacement	2024	$300,000
Whole Area	ARR	Safety	CPS – Cathodic Protection System	HAB CP renewal and upgrade – Hastings/Napier	2028	$159,000
3	GRO	Partnership	Network Growth	Parklands (Napier)	TBC	TBC
4	GRO	Partnership	Network Growth	Wharerangi Road (Napier)	TBC	TBC
5	GRO	Partnership	Network Growth	Mission Estate (Napier)	TBC	TBC
6	GRO	Partnership	Network Growth	Guppy Road (Napier)	TBC	TBC
7	GRO	Partnership	Network Growth	Willowbank Road (Napier)	TBC	TBC
8	GRO	Partnership	Network Growth	Te Awa Estates (Napier)	TBC	TBC
9	GRO	Partnership	Network Growth	Frimley-Lyndhurst (Hastings)	TBC	TBC
10	GRO	Partnership	Network Growth	Lyndhurst extension (Hastings)	TBC	TBC
11	GRO	Partnership	Network Growth	Howard Street (Hastings)	TBC	TBC

Item	Work type	Driver	Asset Management Strategy	Project	Delivery target	Delivery budget
12	GRO	Partnership	Network Growth	Brookvale & Napier Road (Havelock North)	TBC	TBC
13	GRO	Partnership	Network Growth	Aratiaki Road (Havelock North)	TBC	TBC
14	GRO	Partnership	Network Growth	Iona (Havelock North)	TBC	TBC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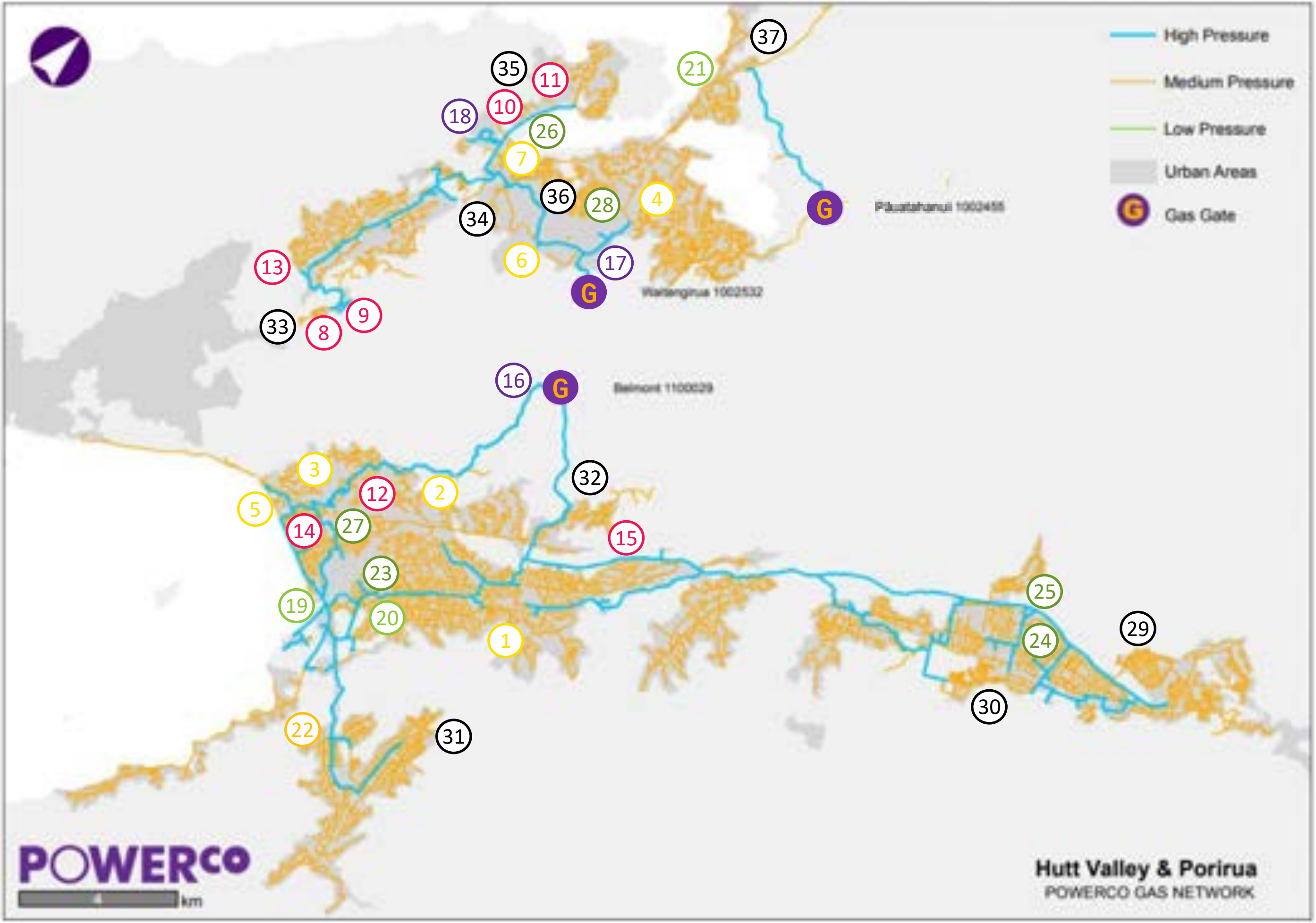
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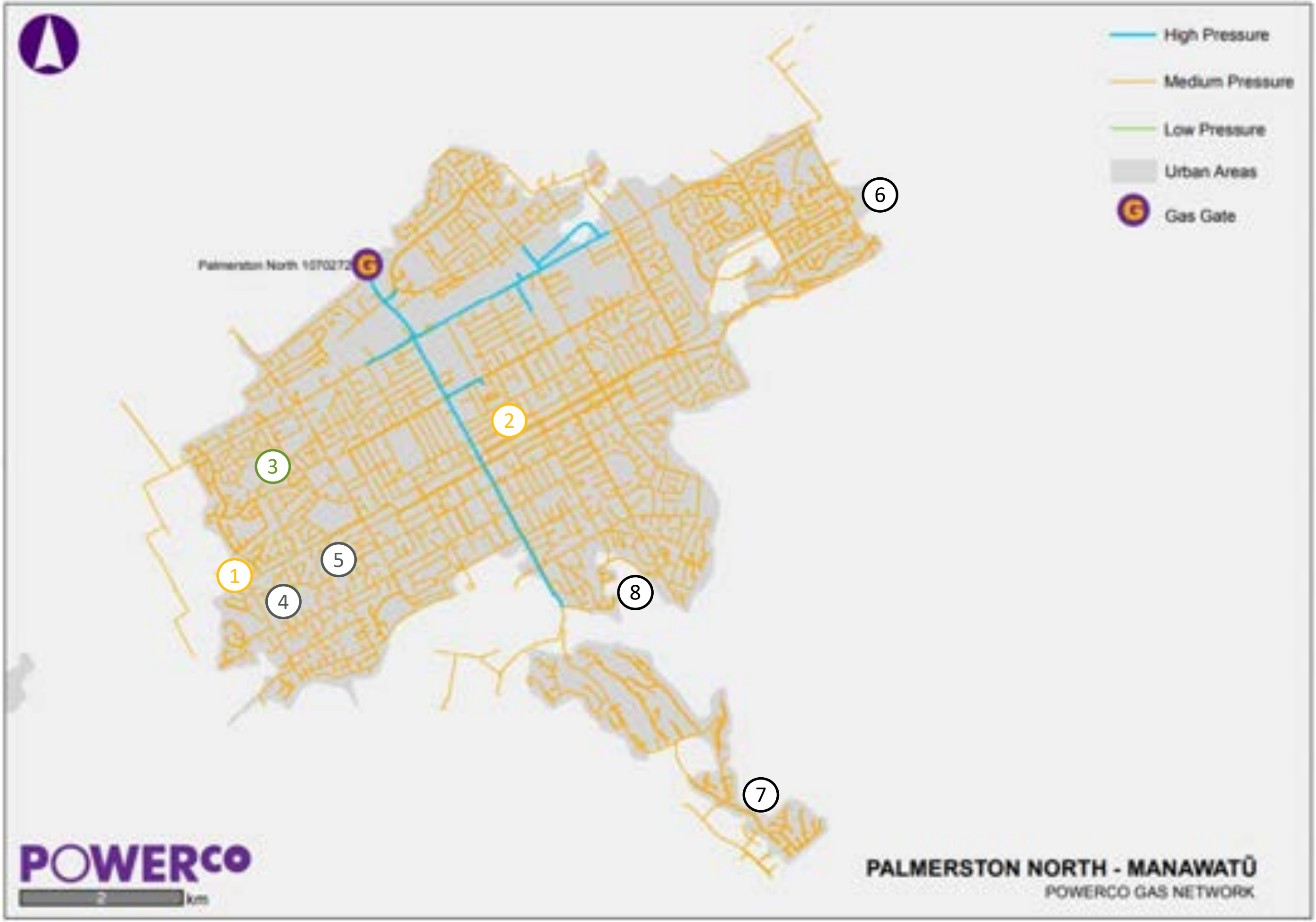
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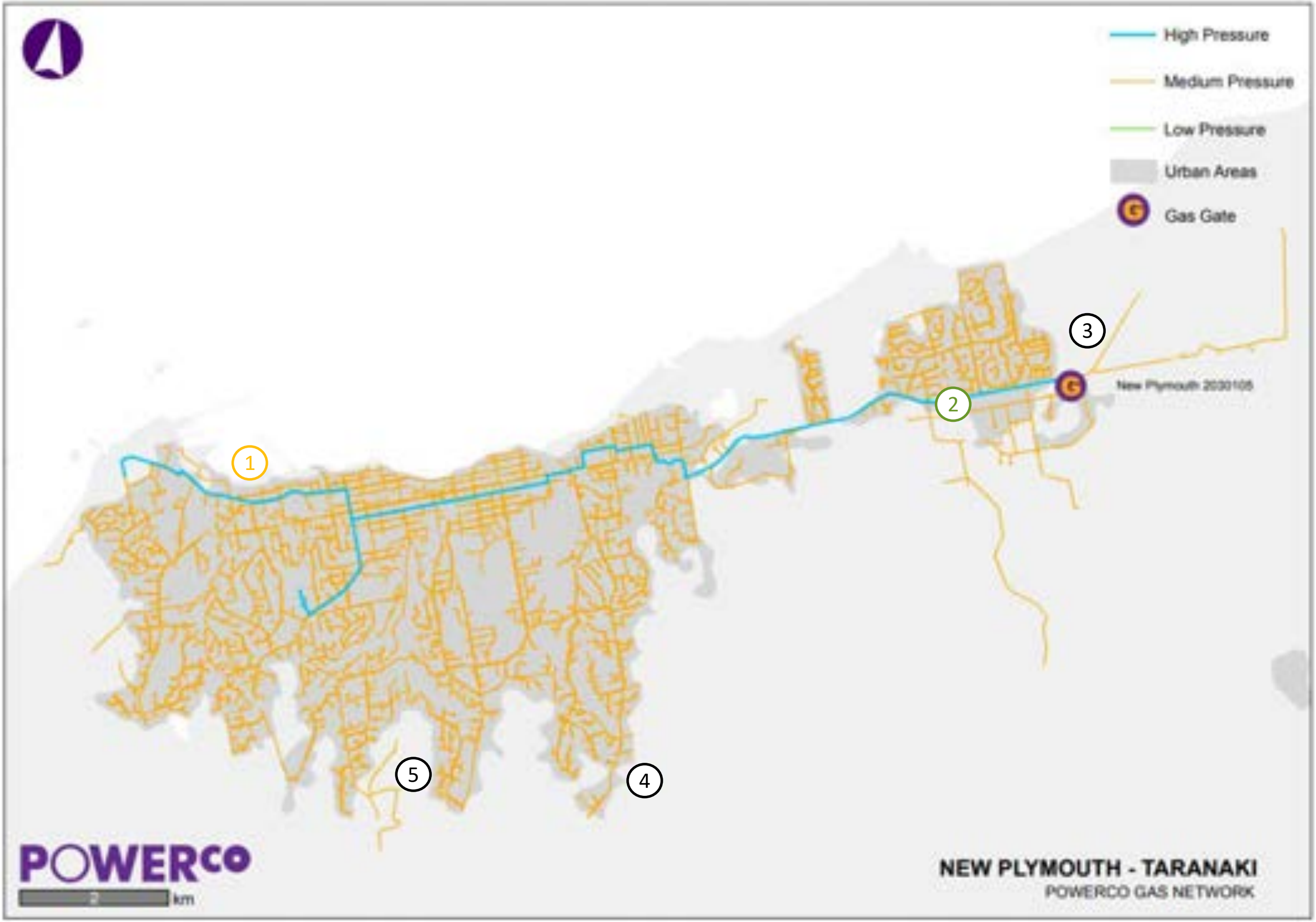
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NEW PLYMOUTH - TARANAKI
POWERCO GAS NETWORK

HASTINGS - HAWKE'S BAY

POWERCO GAS NETWORK

Appendices

This section provides additional information to support our AMP.
It includes our Information Disclosure schedules.

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Appendix 1 – Key assumptions of the AMP

This AMP is based on some fundamental assumptions that underpin our long-term strategic direction and operating environment. The scenarios described have been used as the base case for the detailed AMP planning across this period. These key assumptions are:

- The core gas organisational structure has changed. In 2022, the Gas Customer and Commercial team, responsible for customer relationship management, was merged with the Electricity Customer teams. This change has enabled us to work across the business, improving the way we work with our customers and enhancing our ability to enable delivery of renewable energy solutions to customers. Powerco continues to operate as a non-vertically integrated gas business.
- The gas transmission system continues to operate and develop in line with our future focused strategies to enable a sustainable transition to a low emissions energy future. Our low carbon transition strategy for the gas network and Volume to Value Strategy outline how we are considering lower carbon options while continuing to maintain the network to an adequate level.
- Powerco is 100% behind Aotearoa New Zealand's net zero target and, to achieve this sustainably, Aotearoa will need a safe, affordable, and resilient mix of energy options, which includes renewable gases.
- We forecast a period of transition where new connection numbers, network growth and the overall demand for gas reduces.
- We have assumed residential connections and disconnections will align to historical averages before the 2018-19 new housing boom and COVID-19, but with a lower consistent growth trend. Commercial gas volumes are forecast to reduce through the transition period to 2050.
- Asset lives are aligned with the standard lives prescribed in the gas default price-quality path (DPP) Input Methodologies reset by the Commerce Commission in 2022. The final decision permitted gas distribution businesses to reduce the remaining lives of their network assets, enabling accelerated capital recovery aligned with the expected duration of natural gas conveyance. Consequently, the remaining lives of Powerco's network assets have been reduced by 31% (from a projected average of 24.98 years to 17.32 years in 2023), to mitigate the increased risk of economic stranding.
- The forecast reflects an increase in capital contributions from RY23 to RY26, with further increases over the following regulatory period to offset the stranding risk of our assets.
- Field services continue to be outsourced, and there are no major disruptive changes to the availability of contractors.
- To increase design throughput, some design services, such as valves and mains replacement, will be outsourced to the field service providers. Critical station designs will continue to be carried out in-house by Powerco project engineers.
- There is no major change to the regulatory regime, for example, structural changes to the regulatory institutions or mechanisms currently in place.
- To the extent possible, all the assumptions made in developing this AMP have been quantified and described in the relevant chapters. Where an assumption is based on information that is sourced from a third party, we have clearly set this out.

Appendix 2 – Glossary of terms

AMP means Asset Management Plan.
AMMAT means Asset Management Maturity Assessment score.
API means Cloud-based application programming interface.
ARR means asset replacement and renewal network development plans.
Capital expenditure (Capex) means the expenditure used to create new assets or increase the service performance or service potential of existing assets beyond the original design service performance or service potential. Capex increases the value of the asset stock and is capitalised in accounting terms.
CBD means Central Business District.
Cocon means Below Ground Regulator Station.
CP means Cathodic Protection.
DCVG means Direct Current Voltage Gradient used to assess condition.
DPP means Default Price-quality Path.
DRS means District Regulator Station.
ERP means Emissions Reduction Plan.
FY means Financial Year ending 31 March of the year in question.
GDB means Gas Distribution Business.
GFSA means Gas Field Service Agreement.
GMS means Gas Measurement System.
GRO means System Growth Network Development Plans.
GWP means Gas Works Plan.
HDCU means High Density Community Areas.
HVP means Hutt Valley and Porirua region that is one of our network areas.
ID means Information Disclosure.
IP means Intermediate Pressure (700-2000kPa).
ISO: 55000 refers to the International Standard Organization publication 55 000. It is a suite of three documents.
KPI means Key Performance Indicator.
LP means Low Pressure (0-7kPa).
MAOP means Maximum Allowable Operating Pressure.
MBIE means Ministry of Business, Innovation and Employment.
MP means Medium Pressure (7-700kPa).
NOC means our Network Operations Centre.
NOP means Nominal Operating Pressure.
NPS means Net Promoter Score.
OMS means Outage Management System, which is used for call operations and the coordination of outage restoration efforts.
Operational expenditure (Opex) means the expenditure directly associated with running the gas distribution network, ensuring it is operating safely at any time. Operating expenditures include maintenance and inspection expenditures required to survey and maintain the assets to achieve their original design lives and service potentials. It also includes the expenses related to our third-party prevention programme.
OPSO means Over Pressure Shut Off valve that automatically closes in the event of elevated pressure.
ORS means Quality of Supply Development Plans.
PE means Polyethylene, which is the material plastic gas pipes are made from.
RCM means Reliability Centred Maintenance.
PRS means Pressure Regulator Station.
QOS means Quality of Supply Network Development plans.
RY means Regulatory Year ending 30 September of the year in question.
SAP means System Analysis Programme, which is our Enterprise Resource Planning system that helps Powerco tie together various business processes and enables the flow of data between them.

TPD means Third-Party Damage caused to our network.
TPI means Third-Party Interference.
TPK means Te Puni Kāpuni (Issues Register), our tool for identifying projects and prioritising their need.
TSO means Transmission System Operator.

Company Name	**Powerco Limited**
AMP Planning Period	**1 October 2023 – 30 September 2033**

SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

This schedule requires a breakdown of forecast expenditure on assets for the current disclosure year and a 10-year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms. Also required is a forecast of the value of commissioned assets (i.e., the value of RAB additions).

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

This information is not part of audited disclosure information.

sch ref			*Current Year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
8													
9		**11a(i): Expenditure on Assets Forecast**	**$000 (nominal dollars)**										
10		Customer connection	5,667	6,864	6,956	7,042	7,214	7,327	7,453	7,617	7,761	7,906	8,046
11		System growth	1,627	994	824	939	1,283	1,491	1,526	1,962	2,523	2,957	3,569
12		Asset replacement and renewal	6,517	7,543	7,427	7,525	7,919	8,614	8,484	9,161	8,680	8,566	8,718
13		Asset relocations	85	138	132	134	137	139	142	145	147	150	153
14		Reliability, safety and environment:											
15		Quality of supply	79	101	-	-	-	68	139	142	145	147	150
16		Legislative and regulatory	-	-	-	-	-	-	-	-	-	-	-
17		Other reliability, safety and environment	692	815	2,154	2,427	1,770	1,410	1,515	1,022	810	1,060	1,079
18		**Total reliability, safety and environment**	772	916	2,154	2,427	1,770	1,478	1,654	1,164	954	1,208	1,229
19		**Expenditure on network assets**	14,668	16,456	17,493	18,067	18,323	19,050	19,259	20,048	20,065	20,787	21,715
20		Expenditure on non-network assets	2,129	2,756	2,182	1,606	1,775	1,757	1,668	1,842	1,628	1,321	1,348
21		**Expenditure on assets**	16,797	19,212	19,675	19,673	20,098	20,807	20,927	21,890	21,693	22,108	23,062
22													
23	*plus*	Cost of financing	144	108	114	118	143	173	175	183	189	203	212
24	*less*	Value of capital contributions	511	600	838	1,075	1,170	1,266	1,361	1,743	1,743	1,743	1,743
25	*plus*	Value of vested assets	-	-	-	-	-	-	-	-	-	-	-
26		**Capital expenditure forecast**	16,430	18,719	18,952	18,716	19,071	19,714	19,741	20,329	20,139	20,569	21,532
27													
28		Assets commissioned	16,934	18,376	18,917	18,752	19,018	19,618	19,737	20,241	20,168	20,504	21,387
29													
30			*Current Year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
31													
32			**$000 (in constant prices)**										
33		Customer connection	5,667	6,655	6,611	6,553	6,589	6,561	6,543	6,556	6,549	6,541	6,526
34		System growth	1,627	964	783	874	1,172	1,335	1,340	1,688	2,129	2,446	2,894
35		Asset replacement and renewal	6,517	7,313	7,059	7,002	7,233	7,714	7,449	7,885	7,325	7,087	7,071
36		Asset relocations	85	133	126	125	125	125	124	125	124	124	124
37		Reliability, safety and environment:											
38		Quality of supply	79	98	-	-	-	61	122	122	122	122	122
39		Legislative and regulatory	-	-	-	-	-	-	-	-	-	-	-
40		Other reliability, safety and environment	692	790	2,048	2,259	1,617	1,263	1,330	879	683	877	875
41		**Total reliability, safety and environment**	772	888	2,048	2,259	1,617	1,324	1,452	1,002	805	999	997
42		**Expenditure on network assets**	14,668	15,954	16,626	16,813	16,736	17,059	16,908	17,255	16,932	17,197	17,612
43		Expenditure on non-network assets	2,129	2,672	2,074	1,495	1,622	1,573	1,464	1,586	1,373	1,093	1,093
44		**Expenditure on assets**	16,797	18,626	18,700	18,308	18,358	18,632	18,372	18,841	18,305	18,290	18,705
45		**Subcomponents of expenditure on assets (where known)**											
46		Research and development	-	-	-	-	-	-	-	-	-	-	-

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SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

This schedule requires a breakdown of forecast expenditure on assets for the current disclosure year and a 10-year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms. Also required is a forecast of the value of commissioned assets (i.e., the value of RAB additions).

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

This information is not part of audited disclosure information.

sch ref												
47												
48		*Current Year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
49												
50	**Difference between nominal and constant price forecasts**	**$000**										
51	Customer connection	-	209	345	489	625	766	910	1,061	1,212	1,365	1,520
52	System growth	-	30	41	65	111	156	186	273	394	511	674
53	Asset replacement and renewal	-	230	368	522	686	900	1,036	1,276	1,355	1,479	1,647
54	Asset relocations	-	4	7	9	12	15	17	20	23	26	29
55	Reliability, safety and environment:											
56	Quality of supply	-	3	-	-	-	7	17	20	23	25	28
57	Legislative and regulatory	-	-	-	-	-	-	-	-	-	-	-
58	Other reliability, safety and environment	-	25	107	168	153	147	185	142	126	183	204
59	**Total reliability, safety and environment**	-	28	107	168	153	154	202	162	149	209	232
60	**Expenditure on network assets**	-	501	867	1,254	1,587	1,991	2,351	2,792	3,133	3,590	4,102
61	Expenditure on non-network assets	-	84	108	111	154	184	204	257	254	228	255
62	**Expenditure on assets**	-	585	975	1,365	1,740	2,174	2,554	3,049	3,387	3,818	4,357
63												
64												

sch ref							
65		*Current Year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*
66	**11a(ii): Customer Connection**						
67	*Customer types defined by GDB**	**$000 (in constant prices)**					
68	Residential/Small commercial	5,470	6,348	6,308	6,253	6,287	6,260
69	Commercial/Industrial	197	307	303	301	302	301
70							
71							
72							
73	** include additional rows if needed*						
74	**Customer connection expenditure**	5,667	6,655	6,611	6,553	6,589	6,561
75	*less* Capital contributions funding customer connection	239	361	605	798	827	871
76	**Customer connection less capital contributions**	5,428	6,294	6,007	5,755	5,762	5,690
77	**11a(iii): System Growth**						
78	**Intermediate Pressure**						
79	Main pipe	-	-	-	-	323	323
80	Service pipe	-	-	-	-	-	-
81	Stations	12	13	-	-	-	-
82	Line valve	-	-	-	-	-	-
83	Special crossings	-	-	-	-	-	-
84	**Intermediate Pressure total**	12	13	-	-	323	323
85	**Medium Pressure**						
86	Main pipe	1,203	742	783	849	786	934
87	Service pipe	389	197	-	24	59	74
88	Stations	-	-	-	-	-	-
89	Line valve	18	9	-	1	3	3
90	Special crossings	3	2	-	0	0	1
91	**Medium Pressure total**	1,612	950	783	874	848	1,012

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SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

This schedule requires a breakdown of forecast expenditure on assets for the current disclosure year and a 10-year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms. Also required is a forecast of the value of commissioned assets (i.e., the value of RAB additions).

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

This information is not part of audited disclosure information.

sch ref							
92	**Low Pressure**						
93	Main pipe	2	1	-	0	0	0
94	Service pipe	1	0	-	0	0	0
95	Line valve	0	0	-	0	0	0
96	Special crossings	0	0	-	0	0	0
97	**Low Pressure total**	3	1	-	0	0	1
98	**Other network assets**						
99	Monitoring and control systems	-	-	-	-	-	-
100	Cathodic protection systems	-	-	-	-	-	-
101	Other assets (other than above)	-	-	-	-	-	-
102	**Other network assets total**	-	-	-	-	-	-
103							
104	**System growth expenditure**	1,627	964	783	874	1,172	1,335
105	*less* Capital contributions funding system growth	213	126	102	114	153	174
106	**System growth less capital contributions**	1,414	838	681	760	1,019	1,161
107							
108							
109		*Current Year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*
110	**11a(iv): Asset Replacement and Renewal**						
111	**Intermediate Pressure**	**$000 (in constant prices)**					
112	Main pipe	98	138	145	134	140	130
113	Service pipe	48	67	71	66	69	64
114	Stations	1,638	1,435	924	916	921	917
115	Line valve	715	744	3	3	3	3
116	Special crossings	121	126	1	1	1	0
117	**Intermediate Pressure total**	2,620	2,510	1,143	1,119	1,133	1,114
118	**Medium Pressure**						
119	Main pipe	1,976	2,638	3,912	3,895	4,035	4,374
120	Service pipe	965	1,289	1,911	1,903	1,972	2,137
121	Station	22	13	-	-	-	-
122	Line valve	58	77	69	64	67	62
123	Special crossings	546	573	12	11	12	11
124	**Medium Pressure total**	3,567	4,590	5,904	5,873	6,086	6,584
125	**Low Pressure**						
126	Main pipe	2	4	7	7	7	7
127	Service pipe	1	2	4	3	4	3
128	Line valve	0	0	0	0	0	0
129	Special crossings	0	0	0	0	0	0
130	**Low Pressure total**	3	6	11	10	11	10

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SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

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

sch ref								
131		**Other network assets**						
132		Monitoring and control systems	103	18	-	-	3	7
133		Cathodic protection systems	225	189	-	-	-	-
134		Other assets (other than above)	-	-	-	-	-	-
135		**Other network assets total**	328	207	-	-	3	7
136								
137		**Asset replacement and renewal expenditure**	6,517	7,313	7,059	7,002	7,233	7,714
138	*less*	Capital contributions funding asset replacement and renewal	-	-	-	-	-	-
139		**Asset replacement and renewal less capital contributions**	6,517	7,313	7,059	7,002	7,233	7,714
140								

141 11a(v): Asset Relocations

142		*Project or programme**						
143								
144								
145								
146								
147								
148		** include additional rows if needed*						
149		All other projects or programmes - asset relocations	85	133	126	125	125	125
150		**Asset relocations expenditure**	85	133	126	125	125	125
151	*less*	Capital contributions funding asset relocations	60	95	89	88	89	88
152		**Asset relocations less capital contributions**	25	39	37	36	36	36
153								

154			*Current Year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*
155		**11a(vi): Quality of Supply**						
156								
157		*Project or programme**	**$000 (in constant prices)**					
158		Cameron Road DRS SCADA	30	31	-	-	-	-
159		The Terrace PRS alterations	18	19	-	-	-	-
160		Pressure loggers	17	18	-	-	-	-
161								
162								
163		** include additional rows if needed*						
164		All other projects or programmes - quality of supply	14	30	-	-	-	61
165		**Quality of supply expenditure**	79	98	-	-	-	61
166	*less*	Capital contributions funding quality of supply	-	-	-	-	-	-
167		**Quality of supply less capital contributions**	79	98	-	-	-	61
168								

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SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

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

sch ref

169 11a(vii): Legislative and Regulatory

170	*Project or programme*						
171							
172							
173							
174							
175							
176	** include additional rows if needed*						
177	All other projects or programmes - legislative and regulatory	-	-	-	-	-	-
178	**Legislative and regulatory expenditure**	-	-	-	-	-	-
179	*less* Capital contributions funding legislative and regulatory	-	-	-	-	-	-
180	**Legislative and regulatory less capital contributions**	-	-	-	-	-	-

181 11a(viii): Other Reliability, Safety and Environment

182	*Project or programme**						
183	Isolation plans and resilience	138	142	487	794	512	407
184	DRS renewals	421	22	-	-	-	-
185	Network rationalisation	87	8	-	-	-	-
186							
187							
188	** include additional rows if needed*						
189	All other projects or programmes - other reliability, safety and environment	47	619	1,561	1,465	1,105	856
190	**Other reliability, safety and environment expenditure**	692	790	2,048	2,259	1,617	1,263
191	*less* Capital contributions funding other reliability, safety and environment	-	-	-	-	-	-
192	**Other reliability, safety and environment less capital contributions**	692	790	2,048	2,259	1,617	1,263
193							

194 11a(ix): Non-Network Assets

195 Routine expenditure

196	*Project or programme**						
197	ICT Capex	1,419	1,803	1,315	889	1,060	1,164
198	Facilities	234	194	153	183	153	153
199	Leases	353	301	243	356	342	256
200							
201							
202	** include additional rows if needed*						
203	All other projects or programmes - routine expenditure	-	-	-	-	-	0
204	**Routine expenditure**	2,006	2,299	1,711	1,428	1,555	1,573

205 Atypical expenditure

206	*Project or programme**						
207	ICT Capex (new capability)	-	-	-	-	-	-
208	Facilities	123	373	363	67	67	-
209							
210							
211							
212	** include additional rows if needed*						
213	All other projects or programmes - atypical expenditure	-	-	-	-	-	-
214	**Atypical expenditure**	123	373	363	67	67	-
215							
216	**Expenditure on non-network assets**	2,129	2,672	2,074	1,495	1,622	1,573

Company Name	**Powerco Limited**
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SCHEDULE 11b: REPORT ON FORECAST OPERATIONAL EXPENDITURE

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

sch ref												
7		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
8												
9	**Operational Expenditure Forecast**	**$000 (in nominal dollars)**										
10	Service interruptions, incidents and emergencies	655	701	724	749	773	798	824	851	879	908	937
11	Routine and corrective maintenance and inspection	3,469	3,899	4,027	4,164	4,296	4,437	4,582	4,732	4,887	5,048	5,213
12	Asset replacement and renewal	2,625	2,778	2,869	2,967	3,061	3,161	3,265	3,372	3,482	3,596	3,714
13	**Network Opex**	6,750	7,378	7,621	7,880	8,129	8,396	8,671	8,955	9,249	9,552	9,865
14	System operations and network support	3,433	4,144	4,189	4,272	4,352	4,439	4,527	4,618	4,710	4,805	4,901
15	Business support	7,639	8,219	8,476	8,744	8,909	9,087	9,269	9,454	9,643	9,836	10,033
16	**Non-network Opex**	11,072	12,363	12,664	13,016	13,260	13,526	13,796	14,072	14,354	14,641	14,933
17	**Operational expenditure**	17,822	19,742	20,285	20,896	21,390	21,921	22,467	23,027	23,602	24,192	24,798
18		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
19												
20		**$000 (in constant prices)**										
21	Service interruptions, incidents and emergencies	655	680	688	697	706	714	723	732	742	751	760
22	Routine and corrective maintenance and inspection	3,469	3,780	3,828	3,875	3,924	3,973	4,023	4,073	4,124	4,176	4,228
23	Asset replacement and renewal	2,625	2,693	2,727	2,761	2,796	2,831	2,866	2,902	2,938	2,975	3,013
24	**Network Opex**	6,750	7,153	7,243	7,334	7,425	7,518	7,613	7,708	7,804	7,902	8,001
25	System operations and network support	3,433	4,018	3,981	3,976	3,975	3,975	3,975	3,975	3,975	3,975	3,975
26	Business support	7,639	7,969	8,056	8,137	8,137	8,137	8,137	8,137	8,137	8,137	8,137
27	**Non-network Opex**	11,072	11,987	12,037	12,112	12,112	12,112	12,112	12,112	12,112	12,112	12,112
28	**Operational expenditure**	17,822	19,140	19,280	19,446	19,538	19,631	19,725	19,820	19,916	20,014	20,113
29	**Subcomponents of operational expenditure (where known)**											
30	Research and development	-	-	-	-	-	-	-	-	-	-	-
	Insurance	83	85	87	89	91	93	95	97	99	102	104
32												
33		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
34												
35	**Difference between nominal and real forecasts**	**$000**										
36	Service interruptions, incidents and emergencies	-	21	36	52	67	83	101	119	137	157	177
37	Routine and corrective maintenance and inspection	-	119	200	289	372	464	559	659	763	872	985
38	Asset replacement and renewal	-	85	142	206	265	330	399	470	544	621	702
39	**Network Opex**	-	225	378	547	704	877	1,058	1,247	1,444	1,650	1,864
40	System operations and network support	-	126	208	296	377	464	553	643	736	830	926
41	Business support	-	250	420	607	771	950	1,131	1,317	1,506	1,699	1,895
42	**Non-network Opex**	-	377	627	903	1,148	1,414	1,684	1,960	2,241	2,528	2,821
43	**Operational expenditure**	-	601	1,005	1,450	1,852	2,291	2,742	3,207	3,686	4,178	4,685

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SCHEDULE 12a: REPORT ON ASSET CONDITION

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

sch ref											
7					**Asset condition at start of planning period (percentage of units by grade)**						
8	**Operating Pressure**	**Asset category**	**Asset class**	**Units**	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**	**Grade unknown**	**Data accuracy (1–4)**	**% of asset forecast to be replaced in next five years**
9	Intermediate Pressure	Main pipe	IP PE main pipe	km	-	-	17.74%	81.57%	0.69%	3	-
10	Intermediate Pressure	Main pipe	IP steel main pipe	km	0.03%	-	79.43%	0.20%	20.33%	3	0.04%
11	Intermediate Pressure	Main pipe	IP other main pipe	km	-	-	20.36%	-	79.64%	3	-
12	Intermediate Pressure	Service pipe	IP PE service pipe	km	-	-	67.03%	30.31%	2.66%	3	-
13	Intermediate Pressure	Service pipe	IP steel service pipe	km	-	-	23.44%	0.18%	76.39%	3	-
14	Intermediate Pressure	Service pipe	IP other service pipe	km	-	-	95.46%	-	4.54%	3	-
15	Intermediate Pressure	Stations	Intermediate Pressure DRS	No.	3.20%	4.80%	64.80%	27.20%	-	3	8.00%
16	Intermediate Pressure	Line valve	IP line valves	No.	0.53%	0.03%	45.02%	10.20%	44.22%	3	0.55%
17	Intermediate Pressure	Special crossings	IP crossings	No.	-	0.61%	95.54%	3.85%	-	3	0.30%
18	Medium Pressure	Main pipe	MP PE main pipe	km	0.15%	0.02%	93.21%	5.62%	1.00%	3	0.17%
19	Medium Pressure	Main pipe	MP steel main pipe	km	2.44%	0.01%	77.16%	0.06%	20.33%	3	2.45%
20	Medium Pressure	Main pipe	MP other main pipe	km	-	-	20.32%	0.02%	79.65%	3	-
21	Medium Pressure	Service pipe	MP PE service pipe	km	0.47%	0.04%	87.23%	9.58%	2.69%	3	0.51%
22	Medium Pressure	Service pipe	MP steel service pipe	km	-	0.01%	23.33%	0.06%	76.60%	3	0.01%
23	Medium Pressure	Service pipe	MP other service pipe	km	-	0.04%	95.08%	0.02%	4.85%	3	0.04%
24	Medium Pressure	Stations	Medium Pressure DRS	No.	3.08%	9.23%	67.69%	20.00%	-	3	12.31%
25	Medium Pressure	Line valve	MP line valves	No.	0.03%	0.02%	41.48%	15.36%	43.11%	3	0.04%
26	Medium Pressure	Special crossings	MP special crossings	No.	0.75%	1.87%	94.66%	2.71%	-	3	1.69%
27	Low Pressure	Main pipe	LP PE main pipe	km	-	-	57.39%	41.92%	0.69%	3	-
28	Low Pressure	Main pipe	LP steel main pipe	km	-	-	79.67%	-	20.33%	3	-
29	Low Pressure	Main pipe	LP other main pipe	km	-	-	6.14%	14.22%	79.64%	3	-
30	Low Pressure	Service pipe	LP PE service pipe	km	-	-	88.78%	8.55%	2.67%	3	-
31	Low Pressure	Service pipe	LP steel service pipe	km	-	-	23.39%	0.25%	76.36%	3	-
32	Low Pressure	Service pipe	LP other service pipe	km	-	-	77.68%	17.78%	4.54%	3	-
33	Low Pressure	Line valve	LP line valves	No.	-	0.42%	29.84%	12.13%	57.62%	3	0.21%
34	Low Pressure	Special crossings	LP special crossings	No.	-	-	-	-	-	3	-
35	All	Monitoring and control systems	Remote terminal units	No.	-	46.27%	41.04%	12.69%	-	4	2.31%
36	All	Cathodic protection systems	Cathodic protection	No.	-	35.38%	29.23%	24.62%	10.77%	3	8.85%

Company Name **Powerco Limited**
AMP Planning Period **01 October 2023 - 30 September 2033**

SCHEDULE 12b: REPORT ON FORECAST UTILISATION

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

sch ref

7 **Forecast utilisation of heavily utilised pipelines**

sch ref	Region	Network	Pressure system	Nominal operating pressure (NOP) (kPa)	Minimum operating pressure (MinOP) (kPa)	Total capacity at MinOP (scmh)	Remaining capacity at MinOP (scmh)	Unit	Utilisation						Comment
									Current Year CY	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	
11	Hawke's Bay	Hastings	Hastings LMP	150	75	1,435	21	scmh	1417	1424	1451	1508	1556	1604	Design for a phased upgrade is under way. In FY23 the first phase of the upgrade was completed to improve supply into Havelock North. If strong growth continues, a second phase to upgrade the main to LIP with a new supply point into Havelock North is expected in RY28. This will be delivered once a droop >60% is recorded.
12								kPa	90	89	85	75	65	89	
13	Hawke's Bay	Hastings	Taradale	150	75	694	46	scmh	641	659	704	749	788	804	Domestic growth is progressing, but at a slower rate than previously forecast. The reduced growth speed is attributed to delays in greenfields development completions. Droop is expected to reach approximately 50% by RY27. A pressure uplift is scheduled for RY29. The desired NOP after uplift is at least 210kPa, potentially allowing merging with the adjacent Napier LMP subsystem. Strong growth in small commercial connections may move works forward by an additional year; monitoring is ongoing.
14								kPa	97	93	87	80	71	69	
15	Hutt Valley/Porirua	Belmont	Belmont LIP	860	430	16,978	60	scmh	17005	17135	17284	17371	17452	17485	The low pressure point resides at Norfolk DRS (Wainuiomata). Low pressure is rarely observed but modelling has remained at 2011 winter peak levels to ensure modelling of 1-in-20-year-peak conditions. With the renewal of the Norfolk DRS in 2022 (Wainuiomata rationalisation), we can allow pressure down to 300kPa before differential across this station is no longer acceptable. A reinforcement project will be enacted immediately upon a breach of 300kPa via SCADA. We anticipate the need for the Wainuiomata IP reinforcement project in RY28, which will see the pressure at
16								kPa	378	355	331	304	275	624	
17	Hutt Valley/Porirua	Belmont	Lower Hutt LMP	125	63	7,038	41	scmh	7033	7033	7033	7033	7033	7033	The low pressure constraint on this subsystem is limited to a single branch of the Lower Hutt LMP subsystem. We permanently monitor the lowest point on the constrained branch. Strong infill residential growth in Lower Hutt central may cause a decline in pressure at this extremity. In the event of a decline in pressures a new cocon in Lower Hutt Central will improve pressures.
18								kPa	64	64	64	64	64	64	
	Hutt Valley/Porirua	Belmont	Wainuiomata	104	52	1,241	7	scmh	1201	1213	1225	1237	1249	1261	The mothballing of The Strand DRS in RY22 (as part of the Wainuiomata rationalisation project) saw this pressure system become highly utilised. Pressures dropped below the threshold so the station was re-instated. This system is no longer a HUP. The low pressure point is in the south, away from the growth area.
								kPa	77	77	77	77	77	77	
	Hutt Valley/Porirua	Waitangirua/ Pāuatahanui	Elsdon LMP	104	52	420	4	scmh	414	414	435	455	474	480	Growth in the form of small subdivisions is expected, but the location of the growth is not expected to impact on the constrained area's performance. We continue to monitor performance on this system.
								kPa	59	59	59	59	59	59	
	Hutt Valley/Porirua	Waitangirua/ Pāuatahanui	Pāuatahanui IP	1,000	500	1,155	103	scmh	1132	1137	1217	1296	1359	1418	Expected residential growth in Plimmerton will be significant and will exceed the IP capacity if upgrades are not undertaken. A planned RY26 gas gate pressure uplift to 1500kPa will improve the pressures further as the large subdivision progresses.
								kPa	549	541	376	1099	1011	913	
	Manawatū	Palmerston North	Palmerston North LMP	100	50	5,863	25	scmh	5906	5940	5980	6000	6012	6024	To address a number of issues, such as low extremity pressures, advanced age regulator stations, and a large number of small stations, East (of State Highway 3) rationalisation was completed in FY23. West rationalisation has been cancelled because of lower priority.
								kPa	40	40	40	40	53	53	

Company Name **Powerco Limited**

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SCHEDULE 12b: REPORT ON FORECAST UTILISATION

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

sch ref

Manawatū	Palmerston North	Summerhill	100	50	533	17	scmh	449	480	515	554	569	584	As the biggest identified area for growth in Palmerston North, we will actively monitor demand and pressure levels.
							kPa	68	64	59	53	50	47	
Manawatū	Oroua Downs	Oroua Downs MP	330	165	216	41	scmh	261	261	261	261	261		The system is at capacity because of an existing large commercial customer. If local customers require more gas or greater pressures beyond what was delivered, further substantial upgrades will be required.
							kPa	63	63	63	63	63	63	
Taranaki	New Plymouth	Bell Block North	225	113	880	21	scmh	850	877	904	922	952	982	Residential growth occurring in the east of this pressure system has slowed, and no reinforcement is expected in the first half of the planning period.
							kPa	151	147	143	141	137	136	
Taranaki	New Plymouth	New Plymouth IP	1,250	625	7,978	443	scmh	8127	8183	8238	8292	8359	8416	The low point on this system is Tukapa St DRS. The Minimum Operating Pressure has been reviewed and set to 400kPa. This is not forecast to have any quality of supply impact in the foreseeable future as the regulator station is adequately sized to perform under low inlet pressures. The station is permanently monitored via SCADA.
							kPa	542	531	521	509	496	486	
Taranaki	New Plymouth	New Plymouth MP	245	123	5,684	54	scmh	5681	5709	5737	5774	5810	5837	There is a single branch of this network where low pressures have been detected. The localised constraint is because of a relatively long run of a relatively low diameter main supplying industrial customers near Breakwater Road. This had been scheduled for upgrade in RY23 (Hutchen Place reinforcement project) to meet commercial growth needs, however because of unforeseen complications, the reinforcement was deemed no longer economical. This means that no additional capacity is or will be available for this localised area of the pressure system. This system is likely to remain on as a HUP for the foreseeable future. The remainder of the network has pressures within specifications, even considering reasonable residential
							kPa	126	125	125	124	123	123	
Taranaki	Pātea	Pātea	350	175	357	56	scmh	355	355	355	355	355	355	Gas gate volumes through Pātea have been slowly trending down for the past five years, hence the improvement compared with historical AMP figures. Monitoring is ongoing.
							kPa	178	178	178	178	178	178	
Taranaki	Waitara	Lepperton MP	350	175	374	36	scmh	401	401	401	401	401	401	The network is constrained because of some larger demand chicken sheds at the extremity of the smaller diameter network. There have been no pressure issues and we don't anticipate any growth. There are no plans to upgrade capacity further unless demand increases.
							kPa	85	85	85	85	85	85	
Taranaki	Waitara	Waitara MP	250	125	904	7	scmh	801	801	801	801	801	801	A recent load increase at a chicken shed has seen pressures at the network extremity reach a droop of just under 60%. Monitoring is ongoing. If the droop exceeds 60%, we will switch over this section of the system to the Lepperton system where the NOP is higher, to alleviate the low pressures. No growth is expected, so this is not expected to occur during the planning period.
							kPa	102	102	102	102	102	102	
Wellington	Tawa A	Chartwell	70	45	278	-	scmh	192	204	216	228	237	237	The subdivision growth to the north is expected to be completed in RY27. Some infill growth may continue, but we do not expect this system to require reinforcement during the planning period. MINOP is set at 45kPa because of a commercial customer requiring higher meter operating pressures. However, in the residential part of the system, where the growth is occurring, a 35kPa MINOP is acceptable. We will monitor the pressure and demand on the network,
							kPa	61	59	55	49	43	43	
Wellington	Tawa A	Karori	135	68	1,766	16	scmh	1770	1770	1770	1770	1770	1770	Pressures are slightly below MinOP. However, with minimal infill growth and no forecast subdivision growth, this is running at an acceptable level. We will look to reinforce the network if pressures ever drop below 54kPa.
							kPa	64	64	64	64	64	64	
Wellington	Tawa A	Wellington 25 kPa	25	13	13,501	28	scmh	13508	13508	13508	13508	13508	13508	The low point is localised within the Thorndon, Wadestown and Northland area of the system. With the removal of the Butavas St PRS feeding in from the Wellington North pressure system, we have seen pressures drop to MinOP, confirmed over winter 2022. With no expected growth in this area, we do not anticipate any need to reinforce the network and we will continue to actively monitor pressures across the
							kPa	12	12	12	12	12	12	

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SCHEDULE 12b: REPORT ON FORECAST UTILISATION

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

sch ref																
27	Wellington	Tawa A	Wellington LIP	1,200	335	26,835	-	scmh	26791	26848	26941	27059	27167	27253	The low point on this system is Karori. The Minimum Operating Pressure has been reviewed and set to 335kPa. We do not expect an improvement on the MinOP, however we also do not expect it to breach MinOP during the planning period. We will continue to monitor through
28								kPa	397	395	391	387	382	379	
29	Wellington	Tawa A	Wellington North	185	93	5,098	95	scmh	5004	5049	5130	5235	5334	5421	With the removal of the Butavas St PRS following a feasibility study in 2022, the most constrained point of the pressure system has been removed. Subdivision activity in the northern part of the region is continuing, however has slowed in pace. We expect constraints in Churton Park by RY28. The Westchester Drive reinforcement project, which has been designed, will be constructed when this system reaches MinOP. This has been tabled for construction in RY29. Subdivision growth in Grenada Village has slowed and we do not expect the need to reinforce the area (Mark Avenue overlay) in the next five years. This system is being continuously monitored.
30								kPa	121	118	110	102	93	84	

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

32

33 **Disclaimer for supply enquiries**

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

35

36 **Notes and assumptions**

37 Growth patterns used reflect our knowledge at the time of writing.
38 If the growth is expected to spread over multiple years, it is uniformly spread over that period.
39 The number of lots identified is multiplied by 0.6scm/h to calculate a diversified load per residential connection. This is summed and placed at a single point in the model where the load is expected to occur.
40 If the growth specified is inferior to our other supply forecasts, we reconcile these by adding the load at one extremity of the network.
41
42

Company Name	**Powerco Limited**
AMP Planning Period	**01 October 2023 - 30 September 2033**

SCHEDULE 12c: REPORT ON FORECAST DEMAND

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

sch ref

7 ## 12c(i) Customer Connection

8 **Number of ICPs connected in year by customer type**

sch ref		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*
10	*Customer types defined by GDB*						
11	Residential	1,430	1,488	1,488	1,488	1,488	1,488
12	Commercial/industrial	65	109	109	109	109	109
13							
14							
15							
16	**Total**	1,495	1,597	1,597	1,597	1,597	1,597

17

18 ## 12c(ii): Gas Delivered

sch ref		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*
19							
20	Number of ICPs at year end (at year end)	114,121	115,019	115,917	116,815	117,713	118,611
21	Maximum daily load (GJ per day)	40,176	39,935	39,695	39,457	39,220	38,985
22	Maximum monthly load (GJ per month)	1,002,713	996,697	990,717	984,772	978,864	972,990
23	Number of directly billed ICPs (at year end)	-	-	-	-	-	-
24	Total gas conveyed (GJ per annum)	8,415,475	8,364,982	8,314,792	8,264,903	8,215,314	8,166,022
25	Average daily delivery (GJ per day)	-	-	-	-	-	-
26							
27	Load factor	69.94%	69.94%	69.94%	69.94%	69.94%	69.94%

Company Name	**Powerco Limited**
AMP Planning Period	**1 October 2023 – 30 September 2033**
Asset Management Standard Applied	**ISO:55001**

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY

This schedule requires information on the GDB’s self-assessment of the maturity of its asset management practices.

Question No.	Function	Question	Score	Evidence — Summary	Why	Who	Record/documented information
3	Asset Management Policy	To what extent has an Asset Management Policy been documented, authorised and communicated?	3	Powerco has a company-wide published Asset Management Policy, which has been approved by the Chief Executive Officer. It is circulated inside the company, published in the Gas Asset Management Plan and available on the company intranet.	Widely used asset management practice standards require an organisation to document, authorise and communicate its Asset Management Policy (eg, as required in PAS 55 para 4.2 i). A key prerequisite of any robust policy is that the organisation's top management must be seen to endorse and fully support it. Also vital to the effective implementation of the policy, is to tell the appropriate people of its content and their obligations under it. Where an organisation outsources some of its asset-related activities, then these people and their organisations must equally be made aware of the policy's content. Also, there may be other stakeholders, such as regulatory authorities and shareholders, who should be made aware of it.	Top management. The management team that has overall responsibility for asset management.	The organisation's Asset Management Policy, its organisational strategic plan, documents indicating how the Asset Management Policy was based upon the needs of the organisation and evidence of communication.
10	Asset Management Strategy	What has the organisation done to ensure that its Asset Management Strategy is consistent with other appropriate organisational policies and strategies, and the needs of stakeholders?	3	Our Strategic Asset Management Plan (SAMP) is contained in Chapters 1 and 4 of our AMP. The SAMP is aligned to our Asset Management Objectives that fall out of our Corporate Strategy. Stakeholder requirements and operating context have guided its development. As a result, the predominant drivers of the SAMP and associated documents are safety, sustainability, resilience and reliability.	In setting an organisation's Asset Management Strategy, it is important that it is consistent with any other policies and strategies that the organisation has and has taken into account the requirements of relevant stakeholders. This question examines to what extent the Asset Management Strategy is consistent with other organisational policies and strategies (eg, as required by PAS 55 para 4.3.1 b) and has taken account of stakeholder requirements as required by PAS 55 para 4.3.1 c). Generally, this will take into account the same polices, strategies and stakeholder requirements as covered in drafting the Asset Management Policy but at a greater level of detail.	Top management. The organisation's strategic planning team. The management team that has overall responsibility for asset management.	The organisation's Asset Management Strategy document and other related organisational policies and strategies. Other than the organisation's strategic plan, these could include those relating to health and safety, environmental, etc. Results of stakeholder consultation.
11	Asset Management Strategy	In what way does the organisation's Asset Management Strategy take account of the lifecycle of the assets, asset types and asset systems over which the organisation has stewardship?	3	Our SAMP, the Asset Class Strategies in Chapter 5 of our AMP, and the suite of associated documents, consider the status of the assets in their lifecycle. For example, we apply a different strategy for existing assets to those newly built. Our Reliability-Centred Maintenance (RCM) approach that we are implementing improves the efficiency of our asset lifecycle management.	Good asset stewardship is the hallmark of an organisation compliant with widely used asset management standards. A key component of this is the need to take account of the lifecycle of the assets, asset types and asset systems. (For example, this requirement is recognised in 4.3.1 d) of PAS 55). This question explores what an organisation has done to take lifecycle into account in its Asset Management Strategy.	Top management. People in the organisation with expert knowledge of the assets, asset types, asset systems and their associated lifecycles. The management team that has overall responsibility for asset management. Those responsible for developing and adopting methods and processes used in asset management	The organisation's documented Asset Management Strategy and supporting working documents.
26	Asset Management Plan(s)	How does the organisation establish and document its Asset Management Plan(s) across the lifecycle activities of its assets and asset systems?	3	Our Asset Class Strategies, Technical Standards and defect management practices are well developed and set the basis for all activities required during the lifecycle of our assets. Chapter 4 of the AMP describes how we manage our capital works programme and forecast expenditure (the forecasts being contained in Chapter 5). Our maintenance programme is supported by comprehensive technical standards and RCM practices.	The Asset Management Strategy needs to be translated into practical plan(s) so that all parties know how the objectives will be achieved. The development of plan(s) will need to identify the specific tasks and activities required to optimise costs, risks and performance of the assets and/or asset system(s), when they are to be carried out and the resources required.	The management team with overall responsibility for the Asset Management System. Operations, maintenance and engineering managers.	The organisation's Asset Management Plan(s).

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AMP Planning Period	**1 October 2023 – 30 September 2033**
Asset Management Standard Applied	**ISO:55001**

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
3	Asset Management Policy	To what extent has an Asset Management Policy been documented, authorised and communicated?	The organisation does not have a documented Asset Management Policy.	The organisation has an Asset Management Policy, but it has not been authorised by top management, or it is not influencing the management of the assets.	The organisation has an Asset Management Policy, which has been authorised by top management, but it has had limited circulation. It may be in use to influence development of strategy and planning but its effect is limited.	The Asset Management Policy is authorised by top management, is widely and effectively communicated to all relevant employees and stakeholders, and used to make these persons aware of their asset related obligations.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
10	Asset Management Strategy	What has the organisation done to ensure that its Asset Management Strategy is consistent with other appropriate organisational policies and strategies, and the needs of stakeholders?	The organisation has not considered the need to ensure that its Asset Management Strategy is appropriately aligned with the organisation's other organisational policies and strategies or with stakeholder requirements. OR The organisation does not have an Asset Management Strategy.	The need to align the Asset Management Strategy with other organisational policies and strategies, as well as stakeholder requirements, is understood and work has started to identify the linkages or to incorporate them in the drafting of an Asset Management Strategy.	Some of the linkages between the long-term Asset Management Strategy and other organisational policies, strategies and stakeholder requirements are defined, but the work is fairly well advanced but still incomplete.	All linkages are in place and evidence is available to demonstrate that, where appropriate, the organisation's Asset Management Strategy is consistent with its other organisational policies and strategies. The organisation has also identified and considered the requirements of relevant stakeholders.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
11	Asset Management Strategy	In what way does the organisation's Asset Management Strategy take account of the lifecycle of the assets, asset types and asset systems over which the organisation has stewardship?	The organisation has not considered the need to ensure that its Asset Management Strategy is produced with due regard to the lifecycle of the assets, asset types or asset systems that it manages. OR The organisation does not have an Asset Management Strategy.	The need is understood, and the organisation is drafting its Asset Management Strategy to address the lifecycle of its assets, asset types and asset systems.	The long-term Asset Management Strategy takes account of the lifecycle of some, but not all, of its assets, asset types and asset systems.	The Asset Management Strategy takes account of the lifecycle of all of its assets, asset types and asset systems.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
26	Asset Management Plan(s)	How does the organisation establish and document its Asset Management Plan(s) across the lifecycle activities of its assets and asset systems?	The organisation does not have an identifiable Asset Management Plan(s) covering asset systems and critical assets.	The organisation has Asset Management Plan(s) but they are not aligned with the Asset Management Strategy and objectives and do not take into consideration the full asset lifecycle (including asset creation, acquisition, enhancement, utilisation, maintenance, decommissioning and disposal).	The organisation is in the process of putting in place comprehensive, documented Asset Management Plan(s) that cover all lifecycle activities, clearly aligned to Asset Management Objectives and the Asset Management Strategy.	Asset Management Plan(s) are established, documented, implemented and maintained for asset systems and critical assets to achieve the Asset Management Strategy and Asset Management Objectives across all lifecycle phases.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.

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AMP Planning Period	**1 October 2023 – 30 September 2033**
Asset Management Standard Applied	**ISO:55001**

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence — Summary	Why	Who	Record/documented information
27	Asset Management Plan(s)	How has the organisation communicated its plan(s) to all relevant parties to a level of detail appropriate to the receiver's role in their delivery?	3.2	Our plans are widely shared with relevant stakeholders. The Gas Asset Management Plan is made available to the public on our website. It is communicated to our service providers, internal teams and external stakeholders. We also run roadshow presentations on an ad-hoc basis to facilitate the understanding of the plan. Performance monitoring and improvement processes are good but will be refined over	Plans will be ineffective unless they are communicated to all those, including contracted suppliers and those who undertake enabling function(s). The plan(s) needs to be communicated in a way that is relevant to those who need to use it.	The management team with overall responsibility for the Asset Management System. Delivery functions and suppliers.	Distribution lists for plan(s). Documents derived from plan(s) which detail the receiver's role in plan delivery. Evidence of communication.
29	Asset Management Plan(s)	How are designated responsibilities for delivery of asset plan actions documented?	3.5	Designated responsibilities for Asset Management Plan delivery are described in Chapter 4 of the AMP. From an operational viewpoint, further details are documented across the business, including the Business Plan, business unit tactical plans, Project Management Framework, position descriptions, and employees' annual review and development forms. Powerco also uses Gas Field Services Agreements to describe the responsibilities of service providers.	The implementation of the Asset Management Plan(s) relies on (1) actions being clearly identified, (2) an owner allocated and (3) that owner having sufficient delegated responsibility and authority to carry out the work required. It also requires alignment of actions across the organisation. This question explores how well the plan(s) set out responsibility for delivery of asset plan actions.	The management team with overall responsibility for the Asset Management System. Operations, maintenance and engineering managers. If appropriate, the performance management team.	The organisation's Asset Management Plan(s). Documentation defining roles and responsibilities of individuals and organisational departments.
31	Asset Management Plan(s)	What has the organisation done to ensure that appropriate arrangements are made available for the efficient and cost effective implementation of the plan(s)? (Note this is about resources and enabling support)	3.5	We are able to insource or outsource the design and project management of the plans, and have specialist resources available through our consultancy networks. Powerco also uses Gas Field Services Agreements to describe the responsibilities of service providers. These were renewed in March 2023. These cover off the vast majority of our works. Outside of these we tender the works in order to achieve market rates. By way of evidence, our average cost of	It is essential that the plan(s) are realistic and can be implemented, which requires appropriate resources to be available and enabling mechanisms in place. This question explores how well this is achieved. The plan(s) not only needs to consider the resources directly required and timescales, but also the enabling activities, including for example, training requirements, supply chain capability and procurement timescales.	The management team with overall responsibility for the Asset Management System. Operations, maintenance and engineering managers. If appropriate, the performance management team. Where appropriate, the procurement team and service providers working on the organisation's asset-related activities.	The organisation's Asset Management Plan(s). Documented processes and procedures for the delivery of the Asset Management Plan.
33	Contingency planning	What plan(s) and procedure(s) does the organisation have for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?	3.3	Well developed and established procedures for dealing with network incidents and emergencies are in place through our Public Safety Management System, and managed centrally by our Network Operations Centre. Our dedicated Risk and Assurance team is the custodian of our ISO: 31000-based Risk and Compliance Management Policy. A Safety and Operating Plan and the Emergency Response Plan exist and are reviewed on a regular basis. A comprehensive approach to staff training is taken with a range of courses offered though a planned approach annually. The contingency plans were tested in the course of Cyclone Gabrielle in 2023, and	Widely used asset management practice standards require that an organisation has plan(s) to identify and respond to emergency situations. Emergency plan(s) should outline the actions to be taken to respond to specified emergency situations and ensure continuity of critical asset management activities, including the communication to, and involvement of, external agencies. This question assesses if, and how well, these plan(s) are triggered, implemented and resolved in the event of an incident. The plan(s) should be appropriate to the level of risk as determined by the organisation's risk assessment methodology. It is also a requirement that relevant personnel are competent and trained.	The manager with responsibility for developing emergency plan(s). The organisation's risk assessment team. People with designated duties within the plan(s) and procedure(s) for dealing with incidents and emergency situations.	The organisation's plan(s) and procedure(s) for dealing with emergencies. The organisation's risk assessments and risk registers.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
27	Asset Management Plan(s)	How has the organisation communicated its plan(s) to all relevant parties to a level of detail appropriate to the receiver's role in their delivery?	The organisation does not have a plan(s) or its distribution is limited to the authors.	The plan(s) is communicated to some of those responsible for delivery of the plan(s). OR Communicated to those responsible for delivery is either irregular or ad-hoc.	The plan(s) is communicated to most of those responsible for delivery, but there are weaknesses in identifying relevant parties resulting in incomplete or inappropriate communication. The organisation recognises improvement is needed and is working towards resolution.	The plan(s) is communicated to all relevant employees, stakeholders and contracted service providers to a level of detail appropriate to their participation or business interests in the delivery of the plan(s) and there is confirmation that it is being used effectively.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
29	Asset Management Plan(s)	How are designated responsibilities for delivery of asset plan actions documented?	The organisation has not documented responsibilities for delivery of asset plan actions.	Asset Management Plan(s) inconsistently documents responsibilities for delivery of plan actions and activities and/or responsibilities, and authorities for implementation inadequate and/or delegation level inadequate to ensure effective delivery and/or contains misalignments with organisational accountability.	Asset Management Plan(s) consistently documents responsibilities for the delivery of actions but responsibility/authority levels are inappropriate/ inadequate, and/or there are misalignments within the organisation.	Asset Management Plan(s) consistently documents responsibilities for the delivery actions and there is adequate detail to enable delivery of actions. Designated responsibility and authority for achievement of asset plan actions is appropriate.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
31	Asset Management Plan(s)	What has the organisation done to ensure that appropriate arrangements are made available for the efficient and cost effective implementation of the plan(s)? (Note this is about resources and enabling support)	The organisation has not considered the arrangements needed for the effective implementation of plan(s).	The organisation recognises the need to ensure appropriate arrangements are in place for implementation of the Asset Management Plan(s) and is in the process of determining an appropriate approach for achieving this.	The organisation has arrangements in place for the implementation of the Asset Management Plan(s) but the arrangements are not yet adequately efficient and/or effective. The organisation is working to resolve existing weaknesses.	The organisation's arrangements fully cover all the requirements for the efficient and cost-effective implementation of the Asset Management Plan(s) and realistically address the resources and timescales required, and any changes needed to functional policies, standards, processes and the asset management information system.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
33	Contingency planning	What plan(s) and procedure(s) does the organisation have for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?	The organisation has not considered the need to establish plan(s) and procedure(s) to identify and respond to incidents and emergency situations.	The organisation has some ad-hoc arrangements to deal with incidents and emergency situations, but these have been developed on a reactive basis in response to specific events that have occurred in the past.	Most credible incidents and emergency situations are identified. Either appropriate plan(s) and procedure(s) are incomplete for critical activities or they are inadequate. Training/external alignment may be incomplete.	Appropriate emergency plan(s) and procedure(s) are in place to respond to credible incidents and manage continuity of critical asset management activities consistent with policies and Asset Management Objectives. Training and external agency alignment is in place.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence — Summary	Why	Who	Record/documented information
37	Structure, authority and responsibilities	What has the organisation done to appoint member(s) of its management team to be responsible for ensuring that the organisation's assets deliver the requirements of the Asset Management Strategy, Objectives and Plan(s)?	3	Chapter 4 of the AMP provides an overview of responsibilities and delegations. The Gas division is led by the General Manager Gas, accountable for delivering Asset Management Objectives and investment plans. The Asset Management team is responsible for developing investment plans and the Operations team is responsible for executing the plans. Responsibilities are reflected in the Business Plan, position descriptions and personal objectives.	In order to ensure that the organisation's assets and asset systems deliver the requirements of the Asset Management Policy, Strategy and Objectives, responsibilities need to be allocated to appropriate people who have the necessary authority to fulfil their responsibilities. (This question, relates to the organisation's assets eg, para b), s 4.4.1 of PAS 55, making it therefore distinct from the requirement contained in para a), s 4.4.1 of PAS 55).	Top management. People with management responsibility for the delivery of Asset Management Policy, Strategy, Objectives and Plan(s). People working on asset-related activities.	Evidence that managers with responsibility for the delivery of Asset Management Policy, Strategy, Objectives and Plan(s) have been appointed and have assumed their responsibilities. Evidence may include the organisation's documents relating to its Asset Management System, organisational charts, job descriptions of post-holders, annual targets/objectives, and personal development plan(s) of post-holders as appropriate.
40	Structure, authority and responsibilities	What evidence can the organisation's top management provide to demonstrate that sufficient resources are available for asset management?	2.8	Resource needs are reviewed quarterly (and sometimes weekly) as part of regular planning efforts. A pool of engineering consultants and service providers have been contracted to manage the volume of work delivered. There are mechanisms to provide flexibility in resourcing arrangements to cater for extraordinary needs. We are also actively managing supply chains to deal with the availability of materials critical for the delivery of the work programme. Reduction in scoring reflects challenges in resourcing for a rapidly changing market and political environment, affecting all gas	Optimal asset management requires top management to ensure sufficient resources are available. In this context, the term 'resources' includes manpower, materials, funding and service provider support.	Top management. The management team that has overall responsibility for asset management. Risk Management team. The organisation's managers involved in day-to-day supervision of asset-related activities, such as frontline managers, engineers, foremen and chargehands as appropriate.	Evidence demonstrating that the Asset Management Plan(s) and/or the process(es) for Asset Management Plan implementation consider the provision of adequate resources in both the short and long term. Resources include funding, materials, equipment, services provided by third parties and personnel (internal and service providers) with appropriate skills competencies and knowledge.
42	Structure, authority and responsibilities	To what degree does the organisation's top management communicate the importance of meeting its asset management requirements?	3	The requirements are reflected in the Business Plan, which is communicated via road shows, KPI reporting, updates via the intranet and via an internal publication called 'The Wire'. There are also regular communiques from the CEO about how the business is performing. The GM Gas also provides regular briefings on progress. Specific Asset Management Objectives are set up for the business from a Board level and reported back. The Gas division has an internal communications process that informs staff of general Gas business, targets and plans.	Widely used asset management practice standards require an organisation to communicate the importance of meeting its asset management requirements, such that personnel fully understand, take ownership of, and are fully engaged in the delivery of the asset management requirements (eg, PAS 55 s 4.4.1 g).	Top management. The management team that has overall responsibility for asset management. People involved in the delivery of the asset management requirements.	Evidence of such activities as road shows, written bulletins, workshops, team talks and management walk-abouts would assist an organisation to demonstrate it is meeting this requirement of PAS 55.

45	Outsourcing of asset management activities	Where the organisation has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organisational strategic plan, and its Asset Management policy and strategy?	3	Contractual arrangements are in place to provide a clear and accountable set of standards and work instructions, to agree, instruct and review field work. Dedicated roles exist within the Powerco Operations team to manage the relationship and field work. The Operations Manager has the responsibility of ensuring the overall delivery is achieved in line with contract documentation, KPIs, and agreed actions arising from monthly (and ad-hoc) meetings. For health and safety matters, every contractor should go through a contractor approval process before executing works on the network to ensure they have the appropriate systems to follow our requirements.	Where an organisation chooses to outsource some of its asset management activities, the organisation must ensure that these outsourced process(es) are under appropriate control to ensure that all the requirements of widely used Asset Management standards (eg, PAS 55) are in place, and the Asset Management Policy, Strategy, Objectives and Plan(s) are delivered. This includes ensuring capabilities and resources across a time span aligned to lifecycle management. The organisation must put arrangements in place to control the outsourced activities, whether it be to external providers or to other in-house departments. This question explores what the organisation does in this regard.	Top management. The management team that has overall responsibility for asset management. The manager(s) responsible for the monitoring and management of the outsourced activities. People involved with the procurement of outsourced activities. The people within the organisations that are performing the outsourced activities. The people impacted by the outsourced activity.	The organisation's arrangements that detail the compliance required of the outsourced activities. For example, this could form part of a contract or service level agreement between the organisation and the suppliers of its outsourced activities. Evidence that the organisation has demonstrated to itself that it has assurance of compliance of outsourced activities.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
37	Structure, authority and responsibilities	What has the organisation done to appoint member(s) of its management team to be responsible for ensuring that the organisation's assets deliver the requirements of the Asset Management Strategy, Objectives and Plan(s)?	Top management has not considered the need to appoint a person or persons to ensure that the organisation's assets deliver the requirements of the Asset Management Strategy, Objectives and Plan(s).	Top management understands the need to appoint a person or persons to ensure that the organisation's assets deliver the requirements of the Asset Management Strategy, Objectives and Plan(s).	Top management has appointed appropriate people to ensure the assets deliver the requirements of the Asset Management Strategy, Objectives and Plan(s) but their areas of responsibility are not fully defined and/or they have insufficient delegated authority to fully execute their responsibilities.	The appointed person or persons have full responsibility for ensuring that the organisation's assets deliver the requirements of the Asset Management Strategy, Objectives and Plan(s). They have been given the necessary authority to achieve this.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
40	Structure, authority and responsibilities	What evidence can the organisation's top management provide to demonstrate that sufficient resources are available for asset management?	The organisation's top management has not considered the resources required to deliver asset management.	The organisation's top management understands the need for sufficient resources but there are no effective mechanisms in place to ensure this is the case.	A process exists for determining what resources are required for its asset management activities and in most cases these are available but in some instances resources remain insufficient.	An effective process exists for determining the resources needed for asset management and sufficient resources are available. It can be demonstrated that resources are matched to asset management requirements.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
42	Structure, authority and responsibilities	To what degree does the organisation's top management communicate the importance of meeting its asset management requirements?	The organisation's top management has not considered the need to communicate the importance of meeting asset management requirements.	The organisation's top management understands the need to communicate the importance of meeting its asset management requirements but does not do so.	Top management communicates the importance of meeting its asset management requirements but only to parts of the organisation.	Top management communicates the importance of meeting its asset management requirements to all relevant parts of the organisation.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.

45	Outsourcing of asset management activities	Where the organisation has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organisational strategic plan, and its Asset Management Policy and Strategy?	The organisation has not considered the need to put controls in place.	The organisation controls its outsourced activities on an ad-hoc basis, with little regard for ensuring for the compliant delivery of the organisational strategic plan and/or its Asset Management Policy and Strategy.	Controls systematically considered but currently only provide for the compliant delivery of some, but not all, aspects of the organisational strategic plan and/or its Asset Management Policy and Strategy. Gaps exist.	Evidence exists to demonstrate that outsourced activities are appropriately controlled to provide for the compliant delivery of the organisational strategic plan, Asset Management Policy and Strategy, and that these controls are integrated into the Asset Management System.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.	

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence — Summary	Why	Who	Record/documented information
48	Training, awareness and competence	How does the organisation develop plan(s) for the human resources required to undertake asset management activities - including the development and delivery of Asset Management Strategy, process(es), Objectives and Plan(s)?	2.8	Powerco participates in industry groups in charge of developing field competency frameworks with the Industry Training Organisation (ITO). A new Competency Framework has been developed across the overall business. Gas is considering how it is to be applied to Gas division roles. Reduction in scoring reflects changes in competency mapping internally, but competency mapping for external resources is more mature.	There is a need for an organisation to demonstrate that it has considered what resources are required to develop and implement its Asset Management System. There is also a need for the organisation to demonstrate that it has assessed what development plan(s) is required to provide its human resources with the skills and competencies to develop and implement its Asset Management Systems. The timescales over which the plan(s) is relevant should be commensurate with the planning horizons within the Asset Management Strategy e.g. if the Asset Management Strategy considers 5, 10 and 15-year time scales, then the human resources development plan(s) should align with these. Resources include both 'in house' and external resources who undertake asset management activities.	Senior management responsible for agreement of plan(s). Managers responsible for developing Asset Management Strategy and Plan(s). Managers with responsibility for development and recruitment of staff (including HR functions). Staff responsible for training. Procurement officers. Contracted service providers.	Evidence of analysis of future work load plan(s) in terms of human resources. Document(s) containing analysis of the organisation's own direct resources and contractors' resource capability over suitable timescales. Evidence, such as minutes of meetings, that suitable management forums are monitoring human resource development plan(s). Training plan(s), personal development plan(s), contract and service level agreements.
49	Training, awareness and competence	How does the organisation identify competency requirements, and then plan, provide, and record the training necessary to achieve the competencies?	3	Powerco has a strong focus on training and development, supported by a structured annual review and development process for Powerco employees. Where applicable, employees agree development plans with reporting manager. These align with Powerco's competency standards, and a generous training budget is available to address training needs.	Widely used Asset Management standards require that organisations undertake a systematic identification of the asset management awareness and competencies required at each level and function within the organisation. Once identified, the training required to provide the necessary competencies should be planned for delivery in a timely and systematic way. Any training provided must be recorded and maintained in a suitable format. Where an organisation has contracted service providers in place, then it should have a means to demonstrate that this requirement is being met for their employees (eg, PAS 55 refers to frameworks suitable for identifying competency	Senior management responsible for agreement of plan(s). Managers responsible for developing Asset Management Strategy and Plan(s). Managers with responsibility for development and recruitment of staff (including HR functions). Staff responsible for training. Procurement officers. Contracted service providers.	Evidence of an established and applied competency requirements assessment process and plan(s) in place to deliver the required training. Evidence that the training programme is part of a wider, co-ordinated asset management activities training and competency programme. Evidence that training activities are recorded and that records are readily available (for both direct and contracted service provider staff) e.g. via organisation-wide information system or local records database.
50	Training, awareness and competence	How does the organisation ensure that persons under its direct control undertaking asset management-related activities have an appropriate level of competence, in terms of education, training or experience?	3	For internal staff, Powerco matches competency requirements with role, then assesses personal performance annually with a view to designing appropriate development needs. For external resources, Powerco clearly identifies competency requirements, including qualifications and training needs based on industry standards and frameworks. This is used in assessing prospective contractors' ability to conduct the work. These are regularly audited for QSE compliance.	A critical success factor for the effective development and implementation of an Asset Management System is the competence of persons undertaking these activities. Organisations should have effective means in place for ensuring the competence of employees to carry out their designated asset management function(s). Where an organisation has contracted service providers undertaking elements of its Asset Management System, the organisation shall assure itself that the outsourced service provider also has suitable arrangements in place to manage the competencies of its employees. The organisation should ensure that the individual and corporate competencies it requires are in place and actively monitor, develop and maintain an appropriate balance of these	Managers, supervisors, persons responsible for developing training programmes. Staff responsible for procurement and service agreements. HR staff and those responsible for recruitment.	Evidence of a competency assessment framework that aligns with established frameworks, such as the asset management Competencies Requirements Framework (Version 2.0); National Occupational Standards for Management and Leadership; UK Standard for Professional Engineering Competence, Engineering Council, 2005.

53	Communication, participation and consultation	How does the organisation ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?	3	Asset information is available to all employees in the appropriate data repositories. Our data repositories are: - SAP for asset data and historical maintenance records, defect management, and works management. Our field service providers use Blueworx, an SAP interface. - GIS, for geospatial data. - Customer Works Management System (CWMS). - Meridian for as-built engineering drawings. - SharePoint for engineering standards and procedures. Each repository is subject to defined	Widely used Asset Management practice standards require that pertinent asset management information is effectively communicated to and from employees and other stakeholders including contracted service providers. Pertinent information refers to information required in order to effectively and efficiently comply with, and deliver, Asset Management Strategy, Plan(s) and Objectives. This will include, for example, the communication of the Asset Management Policy, asset performance information, and planning information as appropriate to contractors.	Top management and senior management representative(s), employee's representative(s), employee's trade union representative(s); contracted service provider management and employee representative(s); representative(s) from the organisation's Health, Safety and Environmental team. Key stakeholder representative(s).	Asset Management Policy statement prominently displayed on notice boards, intranet and internet; use of organisation's website for displaying asset performance data; evidence of formal briefings to employees, stakeholders and contracted service providers; evidence of inclusion of asset management issues in team meetings and contracted service provider contract meetings; newsletters, etc.	

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
48	Training, awareness and competence	How does the organisation develop plan(s) for the human resources required to undertake asset management activities - including the development and delivery of Asset Management Strategy, process(es), Objectives and Plan(s)?	The organisation has not recognised the need for assessing human resources requirements to develop and implement its Asset Management System.	The organisation has recognised the need to assess its human resources requirements and to develop a plan(s). There is limited recognition of the need to align these with the development and implementation of its Asset Management System.	The organisation has developed a strategic approach to aligning competencies and human resources to the Asset Management System, including the Asset Management Plan but the work is incomplete or has not been consistently implemented.	The organisation can demonstrate that a plan(s) is in place and is effective in matching competencies and capabilities to the Asset Management System, including the plan for both internal and contracted activities. Plans are reviewed integral to the Asset Management System process(es).	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
49	Training, awareness and competence	How does the organisation identify competency requirements and then plan, provide and record the training necessary to achieve the competencies?	The organisation does not have any means in place to identify competency requirements.	The organisation has recognised the need to identify competency requirements and then plan, provide and record the training necessary to achieve the competencies.	The organisation is in the process of identifying competency requirements aligned to the Asset Management Plan(s) and then plan, provide and record appropriate training. It is incomplete or inconsistently applied.	Competency requirements are in place and aligned with Asset Management Plan(s). Plans are in place and effective in providing the training necessary to achieve the competencies. A structured means of recording the competencies achieved is in place.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
50	Training, awareness and competence	How does the organisation ensure that persons under its direct control undertaking asset management-related activities have an appropriate level of competence in terms of education, training or experience?	The organisation has not recognised the need to assess the competence of person(s) undertaking asset management-related activities.	Competency of staff undertaking asset management-related activities is not managed or assessed in a structured way, other than formal requirements for legal compliance and safety management.	The organisation is in the process of putting in place a means for assessing the competence of person(s) involved in asset management activities, including contractors. There are gaps and inconsistencies.	Competency requirements are identified and assessed for all persons carrying out asset management-related activities - internal and contracted. Requirements are reviewed and staff reassessed at appropriate intervals aligned to asset management requirements.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.

53	Communication, participation and consultation	How does the organisation ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?	The organisation has not recognised the need to formally communicate any asset management information.	There is evidence that the pertinent asset management information to be shared along with those to share it with is being determined.	The organisation has determined pertinent information and relevant parties. Some effective two-way communication is in place but, as yet, not all relevant parties are clear on their roles and responsibilities with respect to asset management information.	Two-way communication is in place between all relevant parties, ensuring that information is effectively communicated to match the requirements of the Asset Management Strategy, Plan(s) and process(es). Pertinent asset information requirements are regularly reviewed.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.	

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence — Summary	Why	Who	Record/documented information
59	Asset Management System documentation	What documentation has the organisation established to describe the main elements of its Asset Management System and interactions between them?	2.5	The Asset Management System is described in Chapter 4 of the AMP. It covers business functions, such as planning, investment decision-making, asset lifecycle management, risk and review, information management systems, organisation, finance; and how it all aligns with corporate objectives. Our Enterprise Resource Planning system (SAP) has resulted in numerous process flows being redesigned and documented.	Widely used Asset Management practice standards require an organisation to maintain up-to-date documentation that ensures that its Asset Management Systems (ie, the systems the organisation has in place to meet the standards) can be understood, communicated and operated (eg, s 4.5 of PAS 55 requires the maintenance of up-to-date documentation of the Asset Management System requirements specified throughout s 4 of PAS 55).	The management team that has overall responsibility for asset management. Managers engaged in asset management activities.	The documented information describing the main elements of the Asset Management System (process(es)) and their interaction.
62	Information management	What has the organisation done to determine what its asset management information system(s) should contain in order to support its Asset Management System?	3.2	Our data repositories are: - SAP for asset data and historical maintenance records, defect management, and works management. Our field service providers use Blueworx, an SAP interface. - GIS, for geospatial data. - Customer Works Management System (CWMS). - Meridian for as-built engineering drawings. - SharePoint for engineering standards and procedures. Each repository is subject to defined document management rules that support the Asset Management System.	Effective asset management requires appropriate information to be available. Widely used Asset Management standards therefore require the organisation to identify the asset management information it requires in order to support its Asset Management System. Some of the information required may be held by suppliers. The maintenance and development of asset management information systems is a poorly understood specialist activity that is akin to IT management but different from IT management. This group of questions provides some indications as to whether the capability is available and applied. Note: To be effective, an asset information management system requires the mobilisation of technology, people and process(es) that create, secure, make available and destroy the information required to support the Asset Management System.	The organisation's strategic planning team. The management team that has overall responsibility for asset management. Information management team. Operations, maintenance and engineering managers.	Details of the process the organisation has employed to determine what its asset information system should contain in order to support its Asset Management System. Evidence that this has been effectively implemented.
63	Information management	How does the organisation maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	2.5	Powerco is building new reports to monitor and improve visibility, accuracy and completeness of asset data using an SAP Analytics Cloud (SAC) and a business warehouse tool. We have invested in an internal assurance team, to provide increased checks on data accuracy. The BIRD SAP Governance group will have responsibility for data governance across the business. We have also recently improved our document management systems.	The response to the questions is progressive. A higher scale cannot be awarded without achieving the requirements of the lower scale. This question explores how the organisation ensures that information management meets widely used Asset Management practice requirements (eg, s 4.4.6 (a), (c) and (d) of PAS 55).	The management team that has overall responsibility for asset management. Users of the organisational information systems.	The asset management information system, together with the policies, procedure(s), improvement initiatives and audits regarding information controls.
64	Information management	How has the organisation ensured its asset management information system is relevant to its needs?	3	SAP has its own data formatting rules, and self-regulates. QA processes cover inputting, data handling and interpretation processes to ensure that the data is useful. Service providers provide GPS points for asset locations as part of the as-building processes. There is an informal means of correcting data that is found to be inaccurate, incomplete or not relevant. This is still being formalised.	Widely used asset management standards need not be prescriptive about the form of the asset management information system, but simply require that the asset management information system is appropriate to the organisation's needs, can be effectively used, and can supply information that is consistent and of the requisite quality and accuracy.	The organisation's strategic planning team. The management team that has overall responsibility for asset management. Information management team. Users of the organisational information systems.	The documented process the organisation employs to ensure its asset management information system aligns with its asset management requirements. Minutes of information systems review meetings involving users.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
59	Asset Management System documentation	What documentation has the organisation established to describe the main elements of its Asset Management System and interactions between them?	The organisation has not established documentation that describes the main elements of the Asset Management System.	The organisation is aware of the need to put documentation in place and is in the process of determining how to document the main elements of its Asset Management System.	The organisation in the process of documenting its Asset Management System and has documentation in place that describes some, but not all, of the main elements of its Asset Management System and their interaction.	The organisation has established documentation that comprehensively describes all the main elements of its Asset Management System and the interactions between them. The documentation is kept up-to-date.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
62	Information management	What has the organisation done to determine what its asset management information system(s) should contain in order to support its Asset Management System?	The organisation has not considered what asset management information is required.	The organisation is aware of the need to determine in a structured manner what its asset information system should contain in order to support its Asset Management System and is in the process of deciding how to do this.	The organisation has developed a structured process to determine what its asset information system should contain in order to support its Asset Management System and has commenced implementation of the process.	The organisation has determined what its asset information system should contain in order to support its Asset Management System. The requirements relate to the whole lifecycle and cover information originating from both internal and external sources.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
63	Information management	How does the organisation maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	There are no formal controls in place or controls are extremely limited in scope and/or effectiveness.	The organisation is aware of the need for effective controls and is in the process of developing an appropriate control process(es).	The organisation has developed controls that will ensure the data held is of the requisite quality and accuracy and is consistent, and is in the process of implementing them.	The organisation has effective controls in place that ensure the data held is of the requisite quality and accuracy and is consistent. The controls are regularly reviewed and improved where necessary.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
64	Information management	How has the organisation ensured its asset management information system is relevant to its needs?	The organisation has not considered the need to determine the relevance of its asset management information system. At present there are major gaps between what the information system provides and the organisation's needs.	The organisation understands the need to ensure its asset management information system is relevant to its needs and is determining an appropriate means by which it will achieve this. At present there are significant gaps between what the information system provides and the organisation's needs.	The organisation has developed and is implementing a process to ensure its asset management information system is relevant to its needs. Gaps between what the information system provides and the organisation's needs have been identified and action is being taken to close them.	The organisation's asset management information system aligns with its asset management requirements. Users can confirm that it is relevant to their needs.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence — Summary	Why	Who	Record/documented information
69	Risk management process(es)	How has the organisation documented process(es) and/or procedure(s) for the identification and assessment of asset and asset management-related risks throughout the asset lifecycle?	3.2	Powerco has a formal risk management and assurance framework, including a detailed risk register. Specific asset-related risks during their lifecycle are also undertaken using a Failure Mode and Effect Analysis (FMEA) tool, and Formal Safety Assessment. Planned activities take a risk-based approach in conjunction with asset management drivers.	Risk management is an important foundation for proactive asset management. Its overall purpose is to understand the cause, effect and likelihood of adverse events occurring, to optimally manage such risks to an acceptable level, and to provide an audit trail for the management of risks. Widely used standards require the organisation to have process(es) and/or procedure(s) in place that set out how the organisation identifies and assesses asset and asset management-related risks. The risks have to be considered across the four phases of the asset lifecycle (eg, para 4.3.3 of PAS 55).	The top management team, in conjunction with the organisation's senior risk management representatives. There may also be input from the organisation's Safety, Health and Environment team. Staff who carry out risk identification and assessment.	The organisation's risk management framework and/or evidence of specific process(es) and/or procedure(s) that deal with risk control mechanisms. Evidence that the process(es) and/or procedure(s) are implemented across the business and maintained. Evidence of agendas and minutes from risk management meetings. Evidence of feedback into process(es) and/or procedure(s) as a result of incident investigation(s). Risk registers and assessments.
79	Use and maintenance of asset risk information	How does the organisation ensure that the results of risk assessments provide input into the identification of adequate resources and training and competency needs?	3	Powerco uses the risk framework to identify asset-related risks (eg asbestos, confined spaces, voltage on the pipelines), and these inform our approach to competency management, including training needs for staff and contractors.	Widely used asset management standards require that the output from risk assessments are considered and that adequate resource (including staff) and training is identified to match the requirements. t is a further requirement that the effects of the control measures are considered, as there may be implications in resources and training required to achieve other objectives.	Staff responsible for risk assessment and those responsible for developing and approving resource and training plan(s). There may also be input from the organisation's Safety, Health and Environment team.	The organisation's risk management framework. The organisation's resourcing plan(s) and training and competency plan(s). The organisation should be able to demonstrate appropriate linkages between the content of resource plan(s) and training and competency plan(s) to the risk assessments and risk control measures that have been developed.
82	Legal and other requirements	What procedure does the organisation have to identify and provide access to its legal, regulatory, statutory and other asset management requirements, and how are requirements incorporated into the Asset Management System?	3.4	The semi-independent Risk and Assurance and Regulatory teams monitor regulatory changes and inform the business when there are potential impacts and non-compliances. They also review Asset Management Plans to ensure they comply with regulations. We periodically have external auditors come to audit our systems and reports. We use tools called 'Resolver' and 'Comply With' for preparation and auditing of all legal documentation.	In order for an organisation to comply with its legal, regulatory, statutory and other asset management requirements, the organisation first needs to ensure that it knows what they are (eg, PAS 55 specifies this in s 4.4.8). It is necessary to have systematic and auditable mechanisms in place to identify new and changing requirements. Widely used asset management standards also require that requirements are incorporated into the Asset Management System (e.g. procedure(s) and process(es)).	Top management. The organisation's regulatory team. The organisation's legal team or advisors. The management team with overall responsibility for the Asset Management System. The organisation's health and safety team or advisors. The organisation's policy making team.	The organisational processes and procedures for ensuring information of this type is identified, made accessible to those requiring the information, and is incorporated into the Asset Management Strategy and Objectives
88	Lifecycle activities	How does the organisation establish implement and maintain process(es) for the implementation of its Asset Management Plan(s) and control of activities across the creation, acquisition or enhancement of assets - this includes design, modification, procurement, construction and commissioning activities?	3.3	The lifecycle and investment planning processes are documented in Chapters 4 and 5 in the AMP. Design standards are regularly reviewed for relevance, and whenever regulations change. Procurement is governed by technical standards and managed through our maintenance and project delivery frameworks, which set out the processes for design, acquisition, commissioning and maintenance.	Lifecycle activities are about the implementation of the Asset Management Plan(s) i.e. they are the "doing" phase. They need to be done effectively and well in order for asset management to have any practical meaning. As a consequence, widely used standards (eg, PAS 55 s 4.5.1) require organisations to have in place appropriate process(es) and procedure(s) for the implementation of the Asset Management Plan(s) and control of lifecycle activities. This question explores those aspects relevant to asset creation.	Asset managers, design staff, construction staff and project managers from other impacted areas of the business, e.g. procurement.	Documented process(es) and procedure(s) which are relevant to demonstrating the effective management and control of lifecycle activities during asset creation, acquisition, enhancement, including design, modification, procurement, construction and commissioning.

Company Name	**Powerco Limited**
AMP Planning Period	**1 October 2023 – 30 September 2033**
Asset Management Standard Applied	**ISO:55001**

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
69	Risk management process(es)	How has the organisation documented process(es) and/or procedure(s) for the identification and assessment of asset and asset management-related risks throughout the asset lifecycle?	The organisation has not considered the need to document process(es) and/or procedure(s) for the identification and assessment of asset and asset management-related risks throughout the asset lifecycle.	The organisation is aware of the need to document the management of asset-related risk across the asset lifecycle. The organisation has plan(s) to formally document all relevant process(es) and procedure(s) or has already commenced this activity.	The organisation is in the process of documenting the identification and assessment of asset-related risk across the asset lifecycle, but it is incomplete or there are inconsistencies between approaches and a lack of integration.	Identification and assessment of asset-related risk across the asset lifecycle is fully documented. The organisation can demonstrate that appropriate documented mechanisms are integrated across lifecycle phases and are being consistently applied.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
79	Use and maintenance of asset risk information	How does the organisation ensure that the results of risk assessments provide input into the identification of adequate resources and training and competency needs?	The organisation has not considered the need to conduct risk assessments.	The organisation is aware of the need to consider the results of risk assessments and effects of risk control measures to provide input into reviews of resources, training and competency needs. Current input is typically ad-hoc and reactive.	The organisation is in the process of ensuring that outputs of risk assessment are included in developing requirements for resources and training. The implementation is incomplete and there are gaps and inconsistencies.	Outputs from risk assessments are consistently and systematically used as inputs to develop resources, training and competency requirements. Examples and evidence are available.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
82	Legal and other requirements	What procedure does the organisation have to identify and provide access to its legal, regulatory, statutory and other asset management requirements, and how are requirements incorporated into the Asset Management System?	The organisation has not considered the need to identify its legal, regulatory, statutory and other asset management requirements.	The organisation identifies some legal, regulatory, statutory and other asset management requirements, but this is done in an ad-hoc manner in the absence of a procedure.	The organisation has procedure(s) to identify its legal, regulatory, statutory and other asset management requirements, but the information is not kept up-to-date, is inadequate or inconsistently managed.	Evidence exists to demonstrate that the organisation's legal, regulatory, statutory and other asset management requirements are identified and kept up-to-date. Systematic mechanisms for identifying relevant legal and statutory requirements.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
88	Lifecycle activities	How does the organisation establish implement and maintain process(es) for the implementation of its Asset Management Plan(s) and control of activities across the creation, acquisition or enhancement of assets - this includes design, modification, procurement, construction and commissioning activities?	The organisation does not have process(es) in place to manage and control the implementation of its Asset Management Plan(s) during activities related to asset creation, including design, modification, procurement, construction and commissioning.	The organisation is aware of the need to have process(es) and procedure(s) in place to manage and control the implementation of its Asset Management Plan(s) during activities related to asset creation, including design, modification, procurement, construction and commissioning but currently does not have these in place (note: procedure(s) may exist but they are inconsistent/incomplete).	The organisation is in the process of putting in place process(es) and procedure(s) to manage and control the implementation of its Asset Management Plan(s) during activities related to asset creation, including design, modification, procurement, construction and commissioning. Gaps and inconsistencies are being addressed.	Effective process(es) and procedure(s) are in place to manage and control the implementation of the Asset Management Plan(s) during activities related to asset creation, including design, modification, procurement, construction and commissioning.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.

Company Name	**Powerco Limited**
AMP Planning Period	**1 October 2023 – 30 September 2033**
Asset Management Standard Applied	**ISO:55001**

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence — Summary	Why	Who	Record/documented information
91	Lifecycle activities	How does the organisation ensure that process(es) and/or procedure(s) for the implementation of its Asset Management Plan(s) and control of activities during maintenance (and inspection) of assets are sufficient to ensure activities are carried out under specified conditions, are consistent with Asset Management Strategy, and control cost, risk and performance?	3.5	Powerco has a clearly structured process for controlling the implementation of Asset Management Plans. This includes prescribed work instructions agreed with service providers. A field audit programme is in place involving internal staff to conduct field audits for quality and safety; and audits conducted through independent auditors who report non-compliances. Service provider KPIs are strongly aligned to the proper application of work instructions. The KPIs are made available through the Gas Contractor Portal, and discussed on a monthly basis in contract meetings. Our Safety and Operating Plan documents how we design, build, manage and maintain our assets, and how we monitor their performance. This feeds back into the formal safety assessment process. New reporting tools monitor competence and completeness of maintenance activity.	Having documented process(es) that ensures the Asset Management Plan(s) is implemented in accordance with any specified conditions, in a manner consistent with the Asset Management Policy, Strategy and Objectives, and in such a way that cost, risk and asset system performance are appropriately controlled is critical. They are an essential part of turning intention into action (eg, as required by PAS 55 s 4.5.1).	Asset managers, operations managers, maintenance managers and project managers from other impacted areas of the business	Documented procedure for review. Documented procedure for audit of process delivery. Records of previous audits, improvement actions and documented confirmation that actions have been carried out.
95	Performance and condition monitoring	How does the organisation measure the performance and condition of its assets?	2.5	Defects identified in the course of preventative time-based maintenance provides essential information on asset condition, which, together with risk analysis, informs preventative maintenance strategy and reactive maintenance plans. Further work aims to feed the defect status of our assets into strategic asset planning processes and to address long-standing defects. Chapter 4 outlines the Asset Management Objectives that are embedded in our Asset management Strategies.	Widely used asset management standards require that organisations establish, implement and maintain procedure(s) to monitor and measure the performance and/or condition of assets and asset systems. They further set out requirements in some detail for reactive and proactive monitoring, and leading/lagging performance indicators, together with the monitoring or results to provide input to corrective actions and continual improvement. There is an expectation that performance and condition monitoring will provide input to improving Asset Management Strategy, Objectives and Plan(s).	A broad cross-section of the people involved in the organisation's asset-related activities from data input to decision-makers, i.e. an end-to end assessment. This should include contactors and other relevant third parties as appropriate.	Functional policy and/or strategy documents for performance or condition monitoring and measurement. The organisation's performance monitoring frameworks, balanced scorecards etc. Evidence of the reviews of any appropriate performance indicators and the action lists resulting from these reviews. Reports and trend analysis using performance and condition information. Evidence of the use of performance and condition information shaping improvements and supporting Asset Management Strategy, Objectives and Plan(s).
99	Investigation of asset-related failures, incidents and nonconformities	How does the organisation ensure responsibility and the authority for the handling, investigation and mitigation of asset-related failures, incidents and emergency situations and non conformances is clear, unambiguous, understood and communicated?	3	Asset-related failures are recorded and dealt with through SAP and our Outage Management System (OMS). The incident process, which has been rolled out to all our contractors, requires all incidents to be entered into Resolver (for non-conformance) and/or Safety Manager (for incident review). These will allocate the task of assessing, investigating and closing out the incident. Findings, discussions and reports are tabled at the monthly incident review meeting.	Widely used asset management standards require that the organisation establishes, implements and maintains process(es) for the handling and investigation of failures, incidents and non-conformities for assets and sets down a number of expectations. Specifically, this question examines the requirement to clearly define responsibilities and authorities for these activities, and communicate these unambiguously to relevant people, including external stakeholders if appropriate.	The organisation's safety and environment management team. The team with overall responsibility for the management of the assets. People who have appointed roles within the asset-related investigation procedure - from those who carry out the investigations to senior management who review the recommendations. Operational controllers responsible for managing the asset base under fault conditions and maintaining services to customers. Contractors and other third parties as appropriate.	Process(es) and procedure(s) for the handling, investigation and mitigation of asset-related failures, incidents and emergency situations and non conformances. Documentation of assigned responsibilities and authority to employees. Job descriptions, audit reports. Common communication systems i.e. all job descriptions on internet etc.

105	Audit	What has the organisation done to establish procedure(s) for the audit of its Asset Management System (process(es))?	2.3	Powerco has an internal audit function that addresses the three lines of defence (good management, internal audit, and external audit). The audit function includes review of effectiveness of components of gas' Asset Management Systems.	This question seeks to explore what the organisation has done to comply with the standard practice AM audit requirements (eg, the associated requirements of PAS 55 s 4.6.4 and its linkages to s 4.7).	The management team responsible for its asset management procedure(s). The team with overall responsibility for the management of the assets. Audit teams, together with key staff responsible for asset management, for example, Asset Management Director, Engineering Director. People with responsibility for carrying out risk assessments	The organisation's asset-related audit procedure(s). The organisation's methodology(s) by which it determined the scope and frequency of the audits, and the criteria by which it identified the appropriate audit personnel. Audit schedules, reports etc. Evidence of the procedure(s) by which the audit results are presented, together with any subsequent communications. The risk assessment schedule or risk registers.	

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
91	Lifecycle activities	How does the organisation ensure that process(es) and/or procedure(s) for the implementation of its Asset Management Plan(s) and control of activities during maintenance (and inspection) of assets are sufficient to ensure activities are carried out under specified conditions, are consistent with Asset Management Strategy, and control cost, risk and performance?	The organisation does not have process(es)/procedure(s) in place to control or manage the implementation of the Asset Management Plan(s) during this lifecycle phase.	The organisation is aware of the need to have process(es) and procedure(s) in place to manage and control the implementation of the Asset Management Plan(s) during this lifecycle phase, but currently does not have these in place and/or there is no mechanism for confirming they are effective and, where needed, modifying them.	The organisation is in the process of putting in place process(es) and procedure(s) to manage and control the implementation of the Asset Management Plan(s) during this lifecycle phase. They include a process for confirming the process(es)/procedure(s) are effective and, if necessary, carrying out modifications.	The organisation has in place process(es) and procedure(s) to manage and control the implementation of the Asset Management Plan(s) during this lifecycle phase. They include a process, which is itself regularly reviewed to ensure it is effective, for confirming the process(es)/ procedure(s) are effective and, if necessary, carrying out modifications.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
95	Performance and condition monitoring	How does the organisation measure the performance and condition of its assets?	The organisation has not considered how to monitor the performance and condition of its assets.	The organisation recognises the need for monitoring asset performance but has not developed a coherent approach. Measures are incomplete, predominantly reactive and lagging. There is no linkage to Asset Management Objectives.	The organisation is developing coherent asset performance monitoring linked to Asset Management Objectives. Reactive and proactive measures are in place. Use is being made of leading indicators and analysis. Gaps and inconsistencies remain.	Consistent asset performance monitoring linked to Asset Management Objectives is in place and universally used, including reactive and proactive measures. Data quality management and review process are appropriate. Evidence of leading indicators and analysis.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
99	Investigation of asset-related failures, incidents and nonconformities	How does the organisation ensure responsibility and the authority for the handling, investigation and mitigation of asset-related failures, incidents and emergency situations and non conformances is clear, unambiguous, understood and communicated?	The organisation has not considered the need to define the appropriate responsibilities and the authorities.	The organisation understands the requirements and is in the process of determining how to define them.	The organisation is in the process of defining the responsibilities and authorities with evidence. Alternatively, there are some gaps or inconsistencies in the identified responsibilities/authorities.	The organisation has defined the appropriate responsibilities and authorities and evidence is available to show that these are applied across the business and kept up-to-date.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.

105	Audit	What has the organisation done to establish procedure(s) for the audit of its Asset Management System (process(es))?	The organisation has not recognised the need to establish procedure(s) for the audit of its Asset Management System.	The organisation understands the need for audit procedure(s) and is determining the appropriate scope, frequency and methodology(s).	The organisation is establishing its audit procedure(s) but it does not yet cover all the appropriate asset-related activities.	The organisation can demonstrate that its audit procedure(s) covers all the appropriate asset-related activities and the associated reporting of audit results. Audits are to an appropriate level of detail and consistently managed.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.	

Company Name	**Powerco Limited**
AMP Planning Period	**1 October 2023 – 30 September 2033**
Asset Management Standard Applied	**ISO:55001**

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence — Summary	Why	Who	Record/documented information
109	Corrective and preventative action	How does the organisation instigate appropriate corrective and/or preventative actions to eliminate or prevent the causes of identified poor performance and non-conformance?	2.5	Asset performance management is driven by SAP notifications and influences asset class strategy, and engineering standards. Asset-related failures are recorded and dealt with through SAP and our Outage Management System (OMS). Findings, discussions and reports are tabled at the monthly issues review meeting.	Having investigated asset-related failures, incidents and non-conformances, and taken action to mitigate their consequences, an organisation is required to implement preventative and corrective actions to address root causes. Incident and failure investigations are only useful if appropriate actions are taken as a result to assess changes to a business' risk profile and ensure that appropriate arrangements are in place should a recurrence of the incident happen. Widely used asset management standards also require that necessary changes arising from preventative or corrective action are made to the Asset Management System.	The management team responsible for its asset management procedure(s). The team with overall responsibility for the management of the assets. Audit and incident investigation teams. Staff responsible for planning and managing corrective and preventative actions.	Analysis records, meeting notes and minutes, modification records. Asset Management Plan(s), investigation reports, audit reports, improvement programmes and projects. Recorded changes to asset management procedure(s) and process(es). Condition and performance reviews. Maintenance reviews.
113	Continual improvement	How does the organisation achieve continual improvement in the optimal combination of costs, asset-related risks, and the performance and condition of assets and asset systems across the whole lifecycle?	3.3	Current asset management performance is assessed via appropriate audit processes, which inform improvement programmes. Additionally, our service provider arrangements have been driven by identification of opportunities to reduce costs and improve asset management delivery. Strategies are continually refined to reflect political and market changes, especially calls for decarbonisation. We maintain a lessons learned register for staff to contribute to. Project close-out meetings include lessons learned discussions. Recent emphasis on customer focus has	Widely used asset management standards have requirements to establish, implement and maintain process(es)/procedure(s) for identifying, assessing, prioritising and implementing actions to achieve continual improvement. Specifically, there is a requirement to demonstrate continual improvement in optimisation of cost risk and performance/condition of assets across the lifecycle. This question explores an organisation's capabilities in this area - looking for systematic improvement mechanisms rather that reviews and audit (which are separately examined).	The top management of the organisation. The manager/team responsible for managing the organisation's Asset Management System, including its continual improvement. Managers responsible for policy development and implementation.	Records showing systematic exploration of improvement. Evidence of new techniques being explored and implemented. Changes in procedure(s) and process(es) reflecting improved use of optimisation tools/techniques and available information. Evidence of working parties and research.
115	Continual improvement	How does the organisation seek and acquire knowledge about new asset management-related technology and practices, and evaluate their potential benefit to the organisation?	3.1	We are active in the Gas NZ and Gas Industry Co (GIC), and regularly talk with Ara Ake, equipment suppliers and our peers. Staff regularly attend conferences and are considered knowledgeable and respected industry specialists. We control and drive improved asset technology on our network. We are continually investigating new technology opportunities with specialist consultants. We are working towards alignment with ISO: 55001 asset management principles.	One important aspect of continual improvement is where an organisation looks beyond its existing boundaries and knowledge base to look at what 'new things are on the market'. These new things can include equipment, process(es), tools, etc. An organisation that does this (eg, by the PAS 55 s 4.6 standards) will be able to demonstrate that it continually seeks to expand its knowledge of all things affecting its asset management approach and capabilities. The organisation will be able to demonstrate that it identifies any such opportunities to improve, evaluates them for suitability to its own organisation, and implements them as appropriate. This question explores an organisation's approach to this activity.	The top management of the organisation. The manager/team responsible for managing the organisation's Asset Management System, including its continual improvement. People who monitor the various items that require monitoring for 'change'. People who implement changes to the organisation's policy, strategy, etc. People within an organisation with responsibility for investigating, evaluating, recommending and implementing new tools and techniques, etc.	Research and development projects and records, benchmarking and participation, knowledge exchange professional forums. Evidence of correspondence relating to knowledge acquisition. Examples of change implementation and evaluation of new tools, and techniques linked to Asset Management Strategy and Objectives.

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
109	Corrective and preventative action	How does the organisation instigate appropriate corrective and/or preventative actions to eliminate or prevent the causes of identified poor performance and non-conformance?	The organisation does not recognise the need to have systematic approaches to instigating corrective or preventative actions.	The organisation recognises the need to have systematic approaches to instigating corrective or preventative actions. There is ad-hoc implementation for corrective actions to address failures of assets, but not the Asset Management System.	The need is recognised for systematic instigation of preventative and corrective actions to address root causes of non-compliance or incidents identified by investigations, compliance evaluation or audit. It is only partially or inconsistently in place.	Mechanisms are consistently in place and effective for the systematic instigation of preventative and corrective actions to address root causes of non compliance or incidents identified by investigations, compliance evaluation or audit.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
113	Continual improvement	How does the organisation achieve continual improvement in the optimal combination of costs, asset-related risks, and the performance and condition of assets and asset systems across the whole lifecycle?	The organisation does not consider continual improvement of these factors to be a requirement, or has not considered the issue.	A continual improvement ethos is recognised as beneficial, however it has just been started, and/or covers partially the asset drivers.	Continuous improvement process(es) is set out and includes consideration of cost risk, performance, and condition for assets managed across the whole lifecycle, but it is not yet being systematically applied.	There is evidence to show that continuous improvement process(es), which include consideration of cost risk, performance and condition for assets managed across the whole lifecycle, is being systematically applied.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.
115	Continual improvement	How does the organisation seek and acquire knowledge about new asset management-related technology and practices, and evaluate their potential benefit to the organisation?	The organisation makes no attempt to seek knowledge about new asset management-related technology or practices.	The organisation is inward looking, however it recognises that asset management is not sector specific and other sectors have developed good practice and new ideas that could apply. Ad-hoc approach.	The organisation has initiated asset management communication within the sector to share and/or identify 'new' to sector asset management practices and seeks to evaluate them.	The organisation actively engages internally and externally with other asset management practitioners, professional bodies, and at relevant conferences. Actively investigates and evaluates new practices and evolves its asset management activities using appropriate developments.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the evidence section why this is the case and the evidence seen.

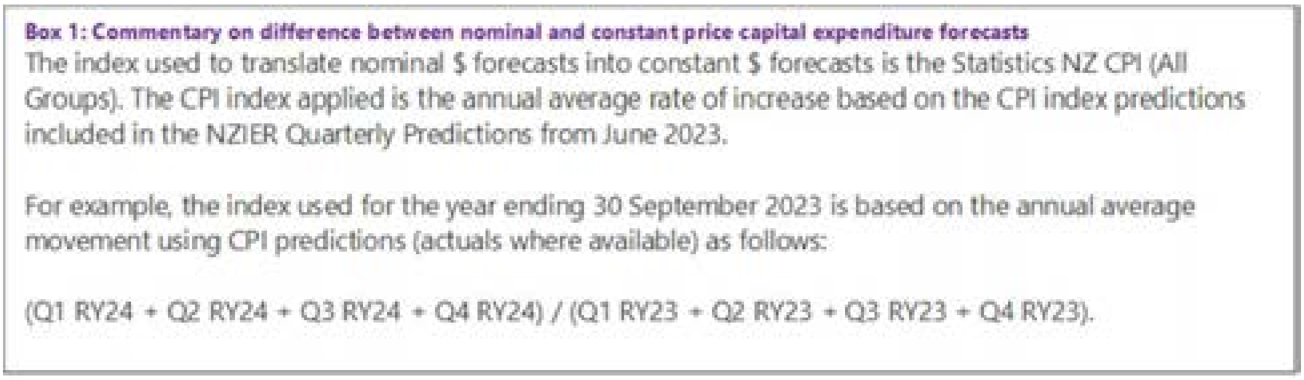
Schedule 14a – Mandatory explanatory notes on forecast information

Company Name: Powerco Limited
For Year Ended: 30 September 2023

1. This schedule requires GDBs to provide explanatory notes to reports prepared in accordance with clause 2.6.6.
2. This schedule is mandatory – GDBs must provide the explanatory comment specified below, in accordance with clause 2.7.2. This information is not part of the audited disclosure information, and so is not subject to the assurance requirements specified in section 2.8.

Commentary on difference between nominal and constant price capital expenditure forecasts (Schedule 11a).

3. In the box below, comment on the difference between nominal and constant price capital expenditure for the current disclosure year and the 10-year planning period, as disclosed in Schedule 11a.



Box 1: Commentary on difference between nominal and constant price capital expenditure forecasts

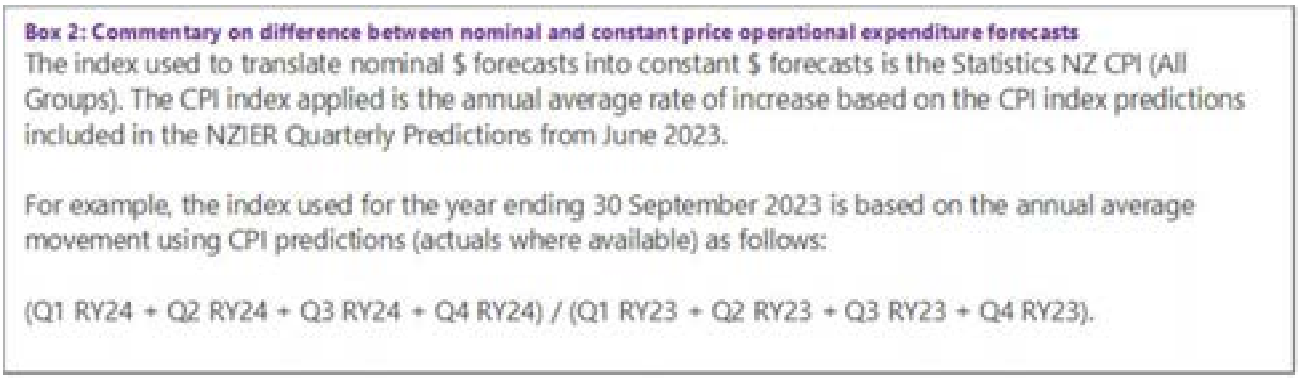
The index used to translate nominal $ forecasts into constant $ forecasts is the Statistics NZ CPI (All Groups). The CPI index applied is the annual average rate of increase based on the CPI index predictions included in the NZIER Quarterly Predictions from June 2023.

For example, the index used for the year ending 30 September 2023 is based on the annual average movement using CPI predictions (actuals where available) as follows:

(Q1 RY24 + Q2 RY24 + Q3 RY24 + Q4 RY24) / (Q1 RY23 + Q2 RY23 + Q3 RY23 + Q4 RY23).

Commentary on difference between nominal and constant price operational expenditure forecasts (Schedule 11b).

4. In the box below, comment on the difference between nominal and constant price operational expenditure for the current disclosure year and the 10-year planning period, as disclosed in Schedule 11b.



Box 2: Commentary on difference between nominal and constant price operational expenditure forecasts

The index used to translate nominal $ forecasts into constant $ forecasts is the Statistics NZ CPI (All Groups). The CPI index applied is the annual average rate of increase based on the CPI index predictions included in the NZIER Quarterly Predictions from June 2023.

For example, the index used for the year ending 30 September 2023 is based on the annual average movement using CPI predictions (actuals where available) as follows:

(Q1 RY24 + Q2 RY24 + Q3 RY24 + Q4 RY24) / (Q1 RY23 + Q2 RY23 + Q3 RY23 + Q4 RY23).

Appendix 4 – General network risk issues

In this appendix, for each hazard in the table below, we describe the risks associated, their controls and risk level after mitigation.

Hazards	Details
Gas release	Gas is released into the atmosphere (this is associated with the loss of structural integrity).
Gas release in an insufficient ventilated space	Gas is released and reaches a critical concentration that can cause asphyxiation or have the potential to be ignited if an energy source is present.
Fire and explosion	Gas is released, reaches a critical concentration, and an additional energy source is present (i.e., ignition source).
Electricity	People are harmed because of the use of electrical equipment (e.g., SCADA cabinet) or the presence of stray currents on metallic pipes.
Pneumatic energy	The gas conveyed through the network is pressurised.
Third-party interference	Assets are damaged or operated by an unauthorised person, including vandalism.
Environmental conditions and natural disasters	Assets are damaged during earthquakes, volcanic eruptions, lahars, thunderstorms, flooding, tsunami, or landslides.
Heights	People are harmed by falling, slipping, or tripping on the asset.
Hazardous material	Assets are made of hazardous material.
Confined spaces	Assets are located in a confined space.

Risks are rated against six levels that are dependent on their likelihood and their consequence, as per the following table.

		Consequence						
		1. Negligible	**2. Minor**	**3. Moderate**	**4. Serious**	**5. Major**	**6. Severe**	**7. Catastrophic**
Likelihood	10. Daily	Low	Medium	Extreme	Extreme	Extreme	Extreme	Extreme
	9. Weekly	Low	Low	Very High	Extreme	Extreme	Extreme	Extreme
	8. Monthly	Very Low	Low	High	Very High	Extreme	Extreme	Extreme
	7. Probable	Very Low	Very Low	Medium	High	Very High	Extreme	Extreme
	6. Possible	Very Low	Very Low	Medium	High	High	Very High	Extreme
	5. Unlikely	Very Low	Very Low	Low	Medium	High	Very High	Extreme
	4. Rare	Very Low	Very Low	Low	Medium	Medium	High	Very High
	3. Improbable	Very Low	Very Low	Low	Low	Medium	High	Very High
	2. Highly improbable	Very Low	Very Low	Very Low	Low	Low	Medium	High
	1. Barely credible	Very Low	Very Low	Very Low	Very Low	Low	Low	Medium

Appendix 4.1 – Risks associated with gas release

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Gas Measurement System (GMS) equipment venting	Over pressure on the inlet that causes physical damage to the equipment.	- Over pressure protection installed at GMS. - Regulators and GMS settings, inspection and maintenance plans.	3. Improbable	3. Moderate	Low
2	Faulty GMS equipment	Due to a fault (e.g., seat or diaphragm failure), GMS equipment releases gas.	- Equipment choice (token relief or full release equipment or over pressure shut off – OPSO). - Regular inspection and maintenance of venting equipment.	4. Rare	2. Minor	Very Low
3	Contamination	Presence of contamination on the network preventing the good operation of regulators.	- Equipment choice (filter, OPSO, token relief or full release equipment). - Regulator maintenance on GMS and district regulator station – DRS (filter inspection). - Construction procedures.	3. Improbable	2. Minor	Very Low
4	DRS equipment venting	Over pressure on the inlet that causes physical damage to the equipment.	- Equipment rating. - Pressure control and protection on upstream networks. - Regulators and DRS settings, inspection, and maintenance plans. - Operational agreement with the Transmission System Operator (TSO).	3. Improbable	3. Moderate	Low
5	Faulty DRS equipment	Due to a fault (e.g., seat or diaphragm failure), DRS equipment releases gas.	- Equipment choice (OPSO, token relief or full release equipment). - Regular inspection and maintenance of equipment.	3. Improbable	3. Moderate	Low
6	Corrosion on Intermediate Pressure (IP) steel pipeline	Leak on an IP steel pipeline because of corrosion.	- Wall thickness. - Corrosion protection (wrapping, cathodic protection). - Safety and operating plan (design/maintenance/response and recovery criteria).	5. Unlikely	3. Moderate	Low
7	Corrosion on Medium Pressure (MP) or Low Pressure (LP) steel pipeline	Leak on an MP or LP steel pipeline because of corrosion.	- Wall thickness. - Corrosion protection (wrapping, cathodic protection). - Safety and operating plan (design/maintenance/response and recovery criteria).	7. Probable	2. Minor	Very Low

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
8	Deterioration on PE80 pipeline	Leak on a polyethylene (PE) pipeline because of wear or brittle material.	- Safety and operating plan. (design/maintenance/response and recovery criteria). - Pre-85 replacement plan.	3. Improbable	4. Serious	Low
9	Deterioration on PE100 pipeline	Leak on a PE pipeline because of wear or brittle material.	- Safety and operating plan (design/maintenance/response and recovery criteria). - Wall thickness. - Material choice.	3. Improbable	4. Serious	Low
10	Slow plastic deformation of a PE pipeline	Leak on a PE pipeline because of deformation related to pressure cycles.	- Safety and operating plan. (design/maintenance/response and recovery criteria). - Material choices.	2. Highly improbable	2. Minor	Very Low
11	Sudden deformation of a PE pipeline	Leak on a PE pipeline because of over pressure on the network creating a permanent deformation of the pipe.	- Material choice (pipe rating). - DRS design, maintenance, and inspection to prevent over pressure.	2. Highly improbable	4. Serious	Low
12	Squeeze-off on PE pipeline	Leak on a PE pipeline because of a plastic deformation following a squeeze-off.	- Safety and operating plan (design/maintenance/response and recovery criteria). - Pre-85 replacement plan. - Defect process. - Squeeze-off minimisation – e.g., limited squeeze-off on PE pipe >100mm.	3. Improbable	4. Serious	Low
13	Stress point failure on pipeline	Leak on a PE pipeline because of stones, vegetation, other utilities etc.	- Backfill material. - Clearance standards. - Stand-over, work permit and preparation standards.	8. Monthly	2. Minor	Low
14	Compression mechanical joint degradation	Leak on a compression mechanical joint because of age and stress (evaluating older joints, anything newer is of lower risk).	- Construction standards recommending electro-fusion, flange joints, fully automatic butt joining and the limitation of joints. - Replacement practice for mechanical joints. - Safety and operating plan (design/maintenance/response and recovery criteria). Note: Do not allow mechanical compression couplings.	3. Improbable	4. Serious	Low

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
15	Plastic fused joint degradation	Leak at plastic fused joint because of age and stress.	- Jointing techniques and procedures, including strength and pressure testing.	3. Improbable	4. Serious	Low
16	Steel welded joint degradation	Leak at steel welded joint because of poor quality or degradation.	- Jointing techniques and procedures, including non-destructive testing, strength, and pressure testing. - Safety and operating plan (design/maintenance/response and recovery criteria). - Regulatory compliance.	3. Improbable	4. Serious	Low
17	Electro-fusion joint degradation	Leak at plastic electro-fusion joint.	- Jointing techniques and procedures, including pressure testing. - Safety and operating plan (design/maintenance/response and recovery criteria).	3. Improbable	4. Serious	Low
18	Valve degradation	Leak at a valve because of wear or age.	- Regular inspection and lubrication. - Safety and operating plan (design/maintenance/response and recovery criteria).	8. Monthly	2. Minor	Low
19	Third-party damage on IP pipeline	Leak on a network asset running at IP after third-party damage (TPD). The asset does not leak at the time, it creates a dent on the pipeline or damage to the coating.	- Location and record of underground assets. - Depth of burial. - Wall thickness. - Signage. - TPD prevention. - Standovers. - Safety and operating plan (design/maintenance/response and recovery criteria).	4. Rare	3. Moderate	Low
20	Third-party damage on IP pipeline	TPD on IP pipeline causes immediate minor leak.	- Location and record of underground assets. - Network material. - Depth of burial. - Signage. - TPD prevention and site support. - Standovers. - Safety and operating plan (design/maintenance/response and recovery criteria).	3. Improbable	4. Serious	Low

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
21	Third-party damage on LP or MP	Leak on a network asset running at LP or MP after TPD. The asset did not leak at the time, it created a dent on the pipeline or damage to the coating.	- Location and record of underground assets. - Depth of burial. - Physical protection. - Signage. - TPD prevention.	8. Monthly	2. Minor	Low

Appendix 4.2 – Risks associated with gas release in an insufficient ventilated space

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Undetected gas release by venting (see gas release)	An equipment vents gas that is not detected until it reaches high concentration in air.	- Gas odorisation. - Regulators, DRS, and equipment maintenance. - Response time to emergency. - Public education, including signage on gas assets and retailer safety messages. - Discharge point design.	3. Improbable	4. Serious	Low
2	Enclosed spaces	Natural gas leaks or travels to an insufficiently ventilated unenclosed space where it accumulates and subsequently causes asphyxiation.	- Gas odorisation. - Location standards. - Discharge point design. - Leak survey.	3. Improbable	5. Major	Medium
3	Unenclosed spaces	Natural gas leaks or travels to an insufficiently ventilated unenclosed space where it accumulates and subsequently causes asphyxiation.	- Gas odorisation. - Location standards. - Pressure protection equipment. - Leak survey.	3. Improbable	4. Serious	Low
4	Gas outage	Gas supply reinstated to the customer without checking the effective operation of the downstream equipment.	- Outage and relight management plan (shutdown supply, doorknob notices etc). - Safety and operating plan (emergency response and recovery criteria).	2. Highly improbable	4. Serious	Low

Appendix 4.3 – Risks associated with fire and explosion

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Ignition source	Gas explosion caused by any ignition source introduced to an explosive condition (approx. 5 to 15% gas: air).	- Network materials. - Network design standards. - Pressure protection. - Odorisation. - Clearance around gas equipment. - Signage on gas assets. - Safety and operating plan (design/maintenance/response and recovery criteria).	2. Highly improbable	7. Catastrophic	High
2	Naked flame	Uncontrolled gas fire caused by any ignition source.	- Network materials and network design standards. - Odorisation. - Signage on gas assets. - Public education.	3. Improbable	5. Major	Medium
3	Step touch potential difference	The potential difference between the assets and workers acts as an ignition source.	- Usage of equipotential mats. - Bonding continuity on assets. - Safety and operating plan (design/maintenance/response and recovery criteria). - Regulations and standards NZECP.	2. Highly improbable	5. Major	Low

Appendix 4.4 – Risks associated with electricity

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Stray and inducted currents	Electric shock caused by low frequency induction (LFI) on a steel pipeline.	- Design standards. - Procedures to work on steel pipelines at risk. - Installation of earthing assets. - Installation of isolation points. - Safety and operating plan (design/maintenance/response and recovery criteria).	3. Improbable	4. Serious	Low

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
2	Stray and inducted currents	Electric shock from earth potential rise (EPR).	- Procedures to work on steel pipelines at risk. - Coating standards. - Electrical standards. - Safety and operating plan (design/maintenance/response and recovery criteria).	3. Improbable	5. Major	Medium
3	Live lines	Electrocution caused by live line coming in direct contact with above ground asset.	- Clearance standards. - Asset location. - Signage. - Safety and operating plan (design/maintenance/response and recovery criteria). - Regulation NZECP34.	3. Improbable	5. Major	Medium
4	Electrical appliances	Electrical appliances bonded to the network by electrician.	- Electrical isolation of the network. - Bonding procedures.	3. Improbable	4. Serious	Low
5	Electrical network equipment	Presence of electrical equipment on the network (e.g., SCADA).	- Construction to standards. - Usage of competent electrician. - Signage.	3. Improbable	4. Serious	Low

Appendix 4.5 – Risks associated with pneumatic energy

#	Risk	Description	Controls	Controlled Likelihood	Controlled Consequence	Controlled Risk
1	Asset failure	The pressure within the network causes assets to fail and to act as a projectile.	- Material standards. - Isolation procedures. - Physical protection. - Choice of operating pressure. - Safety and operating plan (design/maintenance/response and recovery criteria). - Testing standards. Note: Higher pressure the greater the risk.	3. Improbable	5. Major	Medium

Appendix 4.6 – Risks associated with third-party interference

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Third-party excavations (LP or MP pipeline)	Third-party damage (LPD) on LP or MP pipeline causes an immediate leak.	- TPD prevention plan. - Plan issues. - Odorisation. - Site location and records. - Separation. - Signage.	10. Daily	2. Minor	Medium
2	Third-party excavations (IP pipeline)	Hit on underground asset running at IP by machinery (e.g., digger) leading to a pipeline rupture.	- TPD prevention plan. - Work permits, standovers, plan issues. - Location and records. - Separation. - Signage.	4. Rare	5. Major	Medium
3	Third-party excavations (IP pipeline)	TPD on IP pipeline causes immediate minor leak.	- TPD prevention plan. - Work permits, standovers, plan issues. - Location and records. - Physical protection. - Separation. - Signage.	3. Improbable	4. Serious	Low
4	Vehicles	Live gas asset damage caused by vehicle impact.	- Location. - Physical protection. - Pipe material. - Safety and operating plan (design/maintenance/response and recovery criteria).	6. Possible	2. Minor	Very Low
5	Usage of tools	Hit on underground asset by tools.	- TPD prevention plan. - Work permits, standovers, plan issues. - Depth of burial. - Physical protection. - Separation. - Signage.	8. Monthly	2. Minor	Low
6	Light vehicles	Hit on above ground asset by a "light" vehicle (e.g., cyclist).	- Location. - Physical protection. - Pipe material.	3. Improbable	2. Minor	Very Low

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
7	Vandalism	Assets damaged by vandalism.	- Location. - Physical protection and locks. - Pipe material. - Security check as part of maintenance inspections. - SCADA monitoring. - Safety and operating plan – SAOP (design/maintenance/criteria).	6. Possible	1. Negligible	Very Low
8	Terrorism	Assets damaged in a terrorist action.	- Physical protection. - Emergency management plan.	1. Barely credible	6. Severe	Low
9	Vegetation	Vegetation damaging assets.	- Location. - Physical protection. - Safety and operating plan (design/maintenance/response and recovery criteria).	5. Unlikely	2. Minor	Very Low
10	Landslips and rock falls	Foreign objects falling on above ground assets.	- Location. - Design (e.g., crib walls, retaining walls, material selection).	4. Rare	2. Minor	Very Low
11	Other utilities	Water leak blasting on underground assets.	- Clearance from other utilities.	4. Rare	3. Moderate	Low
12	Access to an asset	Intrusion into an asset site and operation.	- Physical protection and locks. - Usage of special tools.	2. Highly improbable	3. Moderate	Very Low
13	Other assets in the vicinity	Other asset owner changing the operating conditions (e.g., gate station pressure) or altering asset configuration.	- SCADA monitoring. - Physical protection and locks.	2. Highly improbable	5. Major	Low
14	Operator error	Network configuration (e.g., pressure) altered because of an operator error.	- Works procedures. - Training.	3. Improbable	2. Minor	Very Low
15	Incorrect information	Network information is wrong and leads to a wrong operation.	- Network records management.	3. Improbable	2. Minor	Very Low

Appendix 4.7 – Risks associated with environmental conditions and natural disasters

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Asset crossing fault line	Harm caused by ruptured asset crossing fault line.	- Pipe material. - Pipeline route assessment. - Emergency response plan.	2. Highly improbable	6. Severe	Medium
2	Earth movement during an earthquake	Asset gets damaged by the earth movement.	- Material choice at design stage. - Emergency response plan.	4. Rare	3. Moderate	Low
3	External damage during an earthquake	Foreign objects falling on and damaging above ground assets.	- Physical protection. - Clearances. - Emergency response plan.	7. Probable	2. Minor	Very Low
4	Liquefaction	Liquefaction after an earthquake causing network displacement.	- Anchoring. - Emergency response plan.	4. Rare	2. Minor	Very Low
5	Volcanic eruption	Foreign objects and/or ashes falling on above ground assets.	- Physical protection - Clearances - Emergency response plan	2. Highly Improbable	2. Minor	Very Low
6	Lahar	Above-ground assets damaged by lahars	- Construction standards. - Isolation valves. - Bridge inspections.	2. Highly improbable	2. Minor	Very Low
7	Lightning	Electrocution caused by lightning travelling on steel pipeline.	- Earthing. - Procedures (weather awareness and stop work).	2. Highly improbable	5. Major	Low
8	Flooding	Above ground or underground assets damaged by flooding.	- Physical protection (above ground assets). - Clearance and location. - Material choice (steel crossings). - Safety and operating plan (design/maintenance/response and recovery criteria),	5. Unlikely	2. Minor	Very Low
9	Tsunami	Above ground asset damaged and underground assets flooded.	- Location. - Emergency response plan.	3. Improbable	4. Serious	Low

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
10	Ground movement by erosion/weather	Assets damaged by ground movement.	- Underground asset design standards. - Response and recovery.	7. Probable	2. Minor	Very Low

Appendix 4.8 – Risks associated with heights

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Above ground assets in the public space	Assets can be unnoticed because of their location.	- Location. - Physical protection.	5. Unlikely	3. Moderate	Low
2	Asset with sharp edge	Assets might have sharp edges that can lead to harm to the public.	- Physical protection. - Assets buried. - Inspections as part of the maintenance programme.	5. Unlikely	3. Moderate	Low
3	Uneven ground	Uneven ground or surface because of the presence of assets (e.g., valve lid).	- Inspections as part of the maintenance programme.	5. Unlikely	3. Moderate	Low

Appendix 4.9 – Risks associated with hazardous materials

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Asset is made of hazardous material	The asset is made of hazardous material. Contractors can be exposed if they work on the asset.	- Material standards. - Replacement programme. - Hazard identification process. - Work instructions. - Issued plans.	3. Improbable	5. Major	Medium

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
2	Exposure to hazardous materials	The asset location (owned or third-party) may contain hazardous materials. Contractors can be exposed if they work on the asset.	- Safety and operating plan (design/maintenance/response and recovery criteria). - Existing registers.	2. Highly improbable	5. Major	Low
3	Duct made of hazardous material	Harm from inhalation or ingestion of hazardous material from exposed duct.	- Material standards. - Work instructions. - Record management (hazardous material is recorded in GIS). - Hazard identification process. - Information to the wider public, including plan issuing.	3. Improbable	5. Major	Medium

Appendix 4.10 – Risks associated with confined spaces

#	Risk	Description	Controls	Controlled likelihood	Controlled consequence	Controlled risk
1	Assets are located in confined spaces	Operations and inspections of assets take place in a confined space. Note: The risk of asphyxiation because of the presence of natural gas is already covered under “Gas release in an insufficient ventilated space”.	- Location standards, including access restriction. - Hazard identification process. - Work instructions and specific PPE. - Gas asset class strategy/valves. - Design and engineering of controls would reduce risk, not comfortable that controls are operating as expected.	7. Probable	4. Serious	High

Appendix 5 – Information disclosure subnetwork correlation

In the Gas Distribution Information Disclosure Determination 2012 (IDD), Powerco is required to disclose, for each subnetwork, the network configuration. The term 'subnetwork' has been defined for Powerco to refer to two specific subnetworks.

1. Central Network: Wellington, and Hutt Valley & Porirua network assets, and
2. Lower Network: Taranaki, Manawatū, and Hawke's Bay network assets.

For the purposes of this AMP, we have network configurations (refer to Table 5.1).

Our gas network boundaries include the Wellington, Hutt Valley, Porirua, Taranaki, Manawatū, and Hawke's Bay regions, as shown in Figure 5.1. This represents how our network assets are managed within our Asset Management System. The subnetwork configurations based on these regions are shown in Table 5.1.

Figure 5.1 – Powerco gas distribution network boundary

Table 5.1: Subnetwork configurations

	Central Network			Lower Network				
Asset class	Wellington	Hutt Valley & Porirua	Subtotal	Taranaki	Manawatū	Hawke's Bay	Subtotal	Total
Mains pipes (km)	683	1,187	1,870	912	811	383	2,106	**3,976**
Service pipes (km)	465	479	944	387	604	98	1,089	**2,033**
Line valves	679	898	1577	376	419	303	1,097	**2,674**
Stations	47	48	95	23	59	13	95	**190**
Special crossings	27	117	144	102	65	53	220	**364**
Cathodic Protection Systems	8	12	20	17	19	1	37	**57**
SCADA systems	22	18	40	11	22	6	39	**79**

Appendix 6 – Network maps by region

Below are the accompanying tables for the network maps. There is a table for each region, and each entry pertains to a separate map.

The following data is accurate to the end of RY22 (30/09/2022).

Major customers are defined as any customer of Load Group G30/G40 or Load Shedding Code 5/7.

6.1 Wellington region networks

Network (gas gate)	Description and major customers	Number of customers (per type)		Total network length (by pressure class) (km)		Maximum gas gate load (GJ/h)	Maximum gas gate annual volume (TJ)
Tawa A	City network supplying a wide range of customers – from residential to large industrials.	**Res./sml. com. :** **Commercial:** **Industrial:**	32069 801 13	**IP:** **MP:** **LP:**	32.6 1128.1 1.4	792.7	1949.4

6.2 Hutt Valley & Porirua region networks

Network (gas gate)	Description and major customers	Number of customers (per type)		Total network length (by pressure class) (km)		Maximum gas gate load (GJ/h)	Maximum gas gate annual volume (TJ)
Belmont	City network supplying the whole Hutt Valley region, including the industrial areas in Seaview.	**Res./sml. com. :** **Commercial:** **Industrial:**	24610 617 11	**IP:** **MP:** **LP:**	99.4 1166.9 0.7	648.7	1241.6
Waitangirua **&** **Pāuatahanui No 1**	City network supplying the northern part of the Wellington region, including Tawa, Porirua and Paremata. Both gas gates are linked in Paremata.	**Res./sml. com. :** **Commercial:** **Industrial:**	8070 204 6	**IP:** **MP:** **LP:**	32.2 410.6 0.1	133.7 & 43	370.3
Pāuatahanui No 2	Rural network supplying residential customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	4 0 0	**IP:** **MP:** **LP:**	0 0.3 0	0.2	0.3

6.3 Manawatū region networks

Network (gas gate)	Description and major customers	Number of customers (per type)		Total network length (by pressure class) (km)		Maximum gas gate load (GJ/h)	Maximum gas gate annual volume (TJ)
Ashhurst	A small town network supplying residential and commercial customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	265 7 0	**IP:** **MP:** **LP:**	0 26.8 0	4.0	9.6
Dannevirke	A small town network also feeding a sawmill, retirement village and an abattoir.	**Res./sml. com. :** **Commercial:** **Industrial:**	91 15 2	**IP:** **MP:** **LP:**	3.4 17.7 0	19.2	51.0
Feilding	A network supplying two towns, agricultural processing, an abattoir and an Air Force Base.	**Res./sml. com. :** **Commercial:** **Industrial:**	1727 61 6	**IP:** **MP:** **LP:**	0 186.9 0	60.7	203.6
Foxton	A small town network feeding a poultry farm.	**Res./sml. com. :** **Commercial:** **Industrial:**	253 10 1	**IP:** **MP:** **LP:**	1.4 35.0 0.1	13.4	30.6
Kairanga	A small rural network feeding only residential customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	6 0 0	**IP:** **MP:** **LP:**	0 2.0 0	11.9	0.8
Kākāriki	A rural network supplying a meat works.	**Res./sml. com. :** **Commercial:** **Industrial:**	0 1 1	**IP:** **MP:** **LP:**	0 10.2 0	20.5	87.4
Levin	A town network with several large commercial and industrial customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	2646 68 4	**IP:** **MP:** **LP:**	0.0 230.5 0.1	70.3	246.2
Longburn	A small town network also feeding a number of industrial customers, a prison and an army base.	**Res./sml. com. :** **Commercial:** **Industrial:**	312 6 5	**IP:** **MP:** **LP:**	8.9 29.1 0	54.5	195.1
Mangatainoka	A rural network supplying a brewery that is out of service, due to be decommissioned FY24.	**Res./sml. com. :** **Commercial:** **Industrial:**	0 0 1	**IP:** **MP:** **LP:**	0 1.2 0	0.0	0.0
Oroua Downs	A rural network supplying a large commercial nursery.	**Res./sml. com. :** **Commercial:** **Industrial:**	3 1 0	**IP:** **MP:** **LP:**	0 3.7 0	10.2	4.9
Pahiatua	A small town network also supplying a large dairy factory and retirement village.	**Res./sml. com. :** **Commercial:** **Industrial:**	101 8 0	**IP:** **MP:** **LP:**	0 13.1 0	3.1	6.7
Palmerston North	City network supplying a wide range of customers, from residential to large industrials.	**Res./sml. com. :** **Commercial:** **Industrial:**	14980 350 7	**IP:** **MP:** **LP:**	12.3 857.4 0.6	292.4	792.7
Takapau	A rural network supplying a single meat works.	**Res./sml. com. :** **Commercial:** **Industrial:**	0 0 1	**IP:** **MP:** **LP:**	4 0 0	24.3	94.5

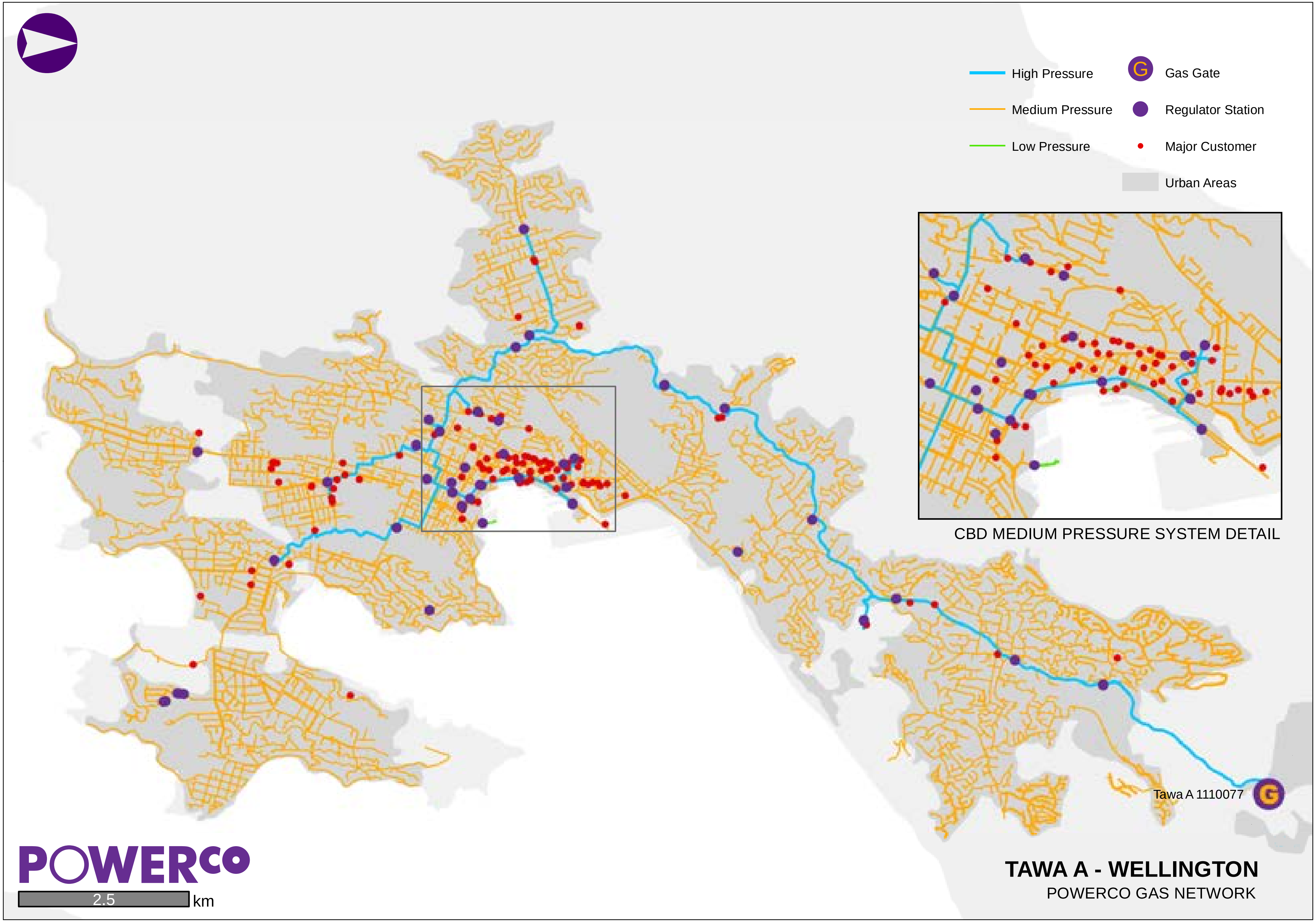
6.4 Taranaki region networks

Network (gas gate)	Description and major customers	Number of customers (per type)		Total network length (by pressure class) (km)		Maximum gas gate load (GJ/h)	Maximum gas gate annual volume (TJ)
Eltham	Small township network supplying large industrial customers – two dairy factories and one abattoir.	**Res./sml. com. :** **Commercial:** **Industrial:**	343 6 3	**IP:** **MP:** **LP:**	1.6 30.5 0	38.9	146.0
Hāwera	A network feeding two towns and a large dairy site outside Hāwera.	**Res./sml. com. :** **Commercial:** **Industrial:**	2897 39 2	**IP:** **MP:** **LP:**	3.9 169.8 0.0	105.2	227.6
Inglewood	Town network supplying residential customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	707 10 0	**IP:** **MP:** **LP:**	0 46.7 0	13.9	26.9
Kaponga	Township network supplying residential customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	58 1 0	**IP:** **MP:** **LP:**	0 5.8 0	0.7	1.5
Kāpuni	Very small township network supplying a dairy factory.	**Res./sml. com. :** **Commercial:** **Industrial:**	3 1 1	**IP:** **MP:** **LP:**	0.4 1.6 0	8.1	26.5
Manaia	Small township network supplying Ōkaiawa, Manaia and an industrial bakery.	**Res./sml. com. :** **Commercial:** **Industrial:**	259 0 1	**IP:** **MP:** **LP:**	0 29.5 0	6.6	12.3
Matapū	Rural network supplying farming installations.	**Res./sml. com. :** **Commercial:** **Industrial:**	5 1 0	**IP:** **MP:** **LP:**	0.0 1.9 0	0.0	0.4
New Plymouth	City network supplying a wide range of customers, from residential to large industrials.	**Res./sml. com. :** **Commercial:** **Industrial:**	12599 245 8	**IP:** **MP:** **LP:**	17.5 697.1 1.0	277.6	751.4
Ōākura	Small township network supplying residential customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	375 6 0	**IP:** **MP:** **LP:**	0 21.8 0	6.0	9.8
Ōkato	Small township network supplying residential customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	73 2 0	**IP:** **MP:** **LP:**	0 9.0 0	1.5	1.8
Ōpunake	Township network with a small number of residential and commercial customers.	**Res./sml. com. :** **Commercial:** **Industrial:**	205 12 0	**IP:** **MP:** **LP:**	0 26.7 0	3.6	7.4
Pātea	Small township network supplying an industrial greenhouse.	**Res./sml. com. :** **Commercial:** **Industrial:**	188 1 1	**IP:** **MP:** **LP:**	0 18.3 0	8.6	6.9
Pungarehu No 1	Rural network supplying two ICPs since the dairy plant shut down.	**Res./sml. com. :** **Commercial:** **Industrial:**	2 0 0	**IP:** **MP:** **LP:**	0 0.2 0	0.0	0.1
Pungarehu No 2	Very small township network built to supply a dairy plant that has since closed down.	**Res./sml. com. :** **Commercial:** **Industrial:**	17 1 0	**IP:** **MP:** **LP:**	0 7.4 0	0.5	0.2
Stratford	Small town network supplying residential and small commercial customers, as well as an abattoir on the outskirts of town.	**Res./sml. com. :** **Commercial:** **Industrial:**	1068 31 2	**IP:** **MP:** **LP:**	5.4 96.3 0.0	27.1	70.2

Waitara	Small town network with high density residential area (subdivisions) supplying a major food processing plant and the township of Lepperton.	**Res./sml. com. :** **Commercial:** **Industrial:**	1299 34 1	**IP:** **MP:** **LP:**	5.8 112.3 0	28.9	88.6
Waverley	Very small township network.	**Res./sml. com. :** **Commercial:** **Industrial:**	8 0 0	**IP:** **MP:** **LP:**	0 6.1 0	0.2	0.1

6.5 Hawke's Bay region networks

Network (gas gate)	Description and major customers	Number of customers (per type)		Total network length (by pressure class) (km)		Maximum gas gate load (GJ/h)	Maximum gas gate annual volume (TJ)
Hastings	Network supplying a large number of industrial and large commercial customers, as well as the cities of Hastings and Napier.	**Res./sml. com. :** **Commercial:** **Industrial:**	5222 350 **21**	**IP:** **MP:** **LP:**	44.1 444.3 8.5	442.3	1934.7



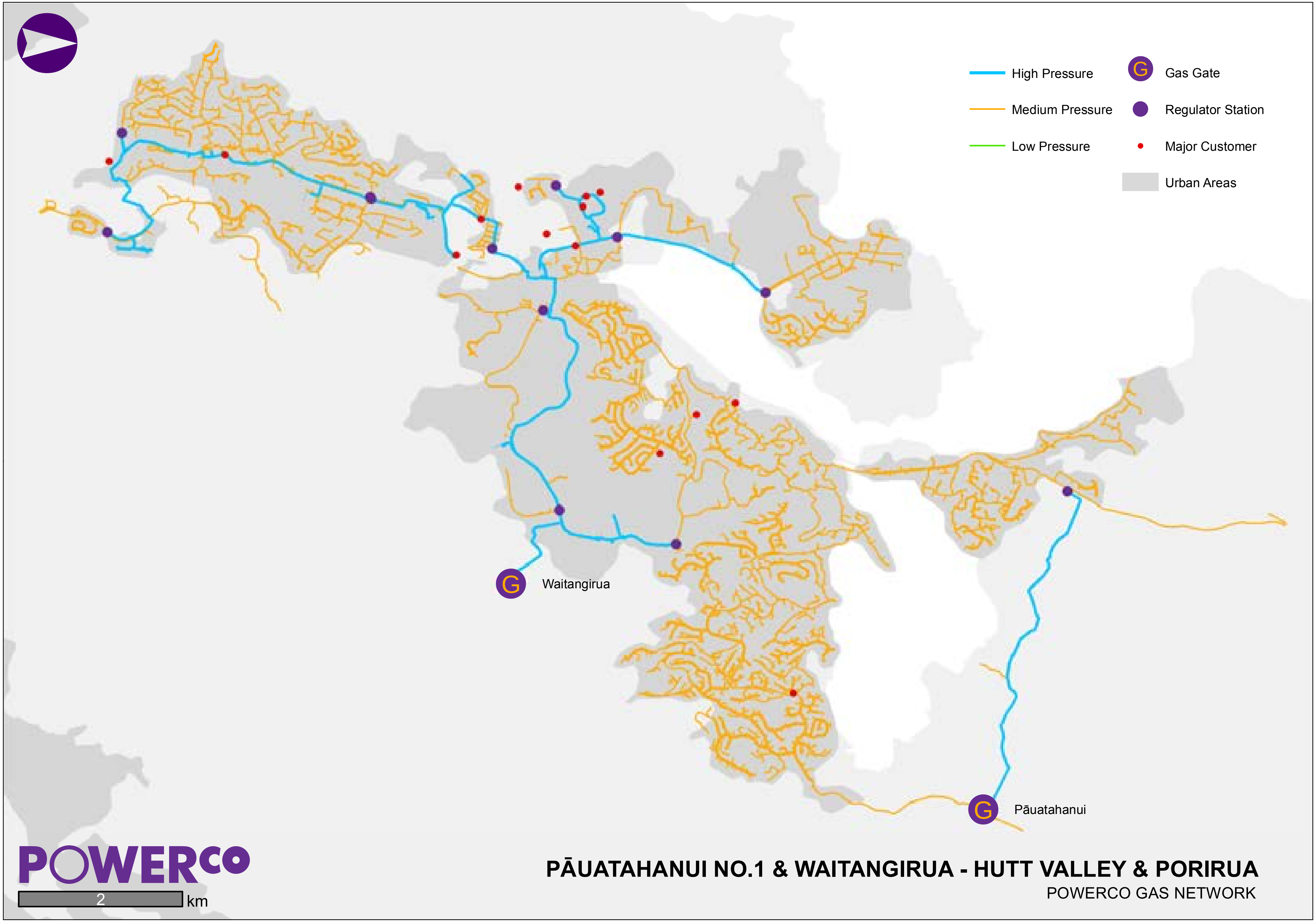
TAWA A - WELLINGTON

POWERCO GAS NETWORK

POWERCO

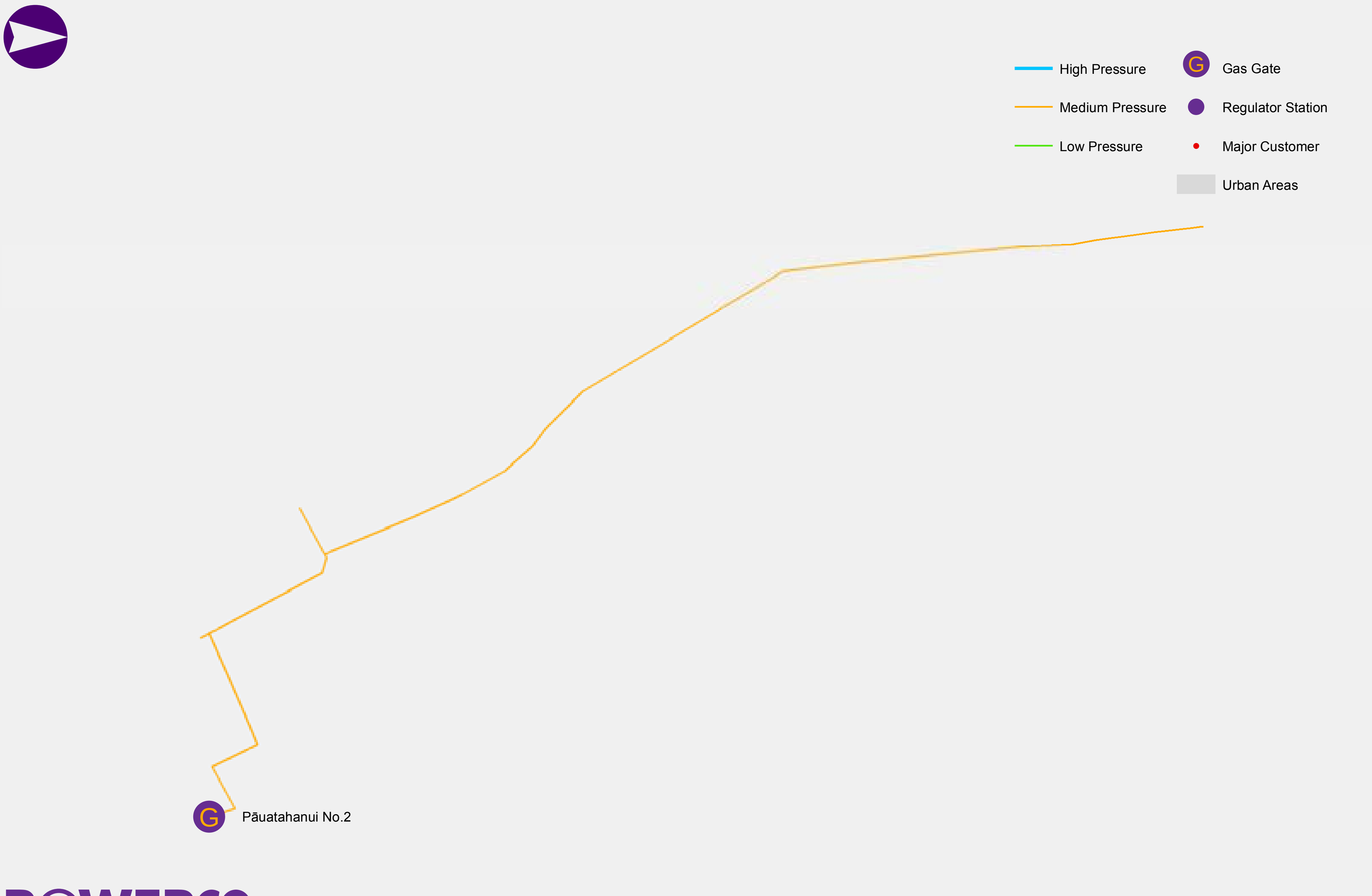
BELMONT - HUTT VALLEY & PORIRUA

POWERCO GAS NETWORK



PĀUATAHANUI NO.1 & WAITANGIRUA - HUTT VALLEY & PORIRUA

POWERCO GAS NETWORK



0.03 km

PĀUATAHANUI NO.2 - HUTT VALLEY & PORIRUA

POWERCO GAS NETWORK

GAS GATE DETAIL

POWERCO

ASHHURST - MANAWATŪ

POWERCO GAS NETWORK

DANNEVIRKE - MANAWATŪ

POWERCO GAS NETWORK

FEILDING - MANAWATŪ

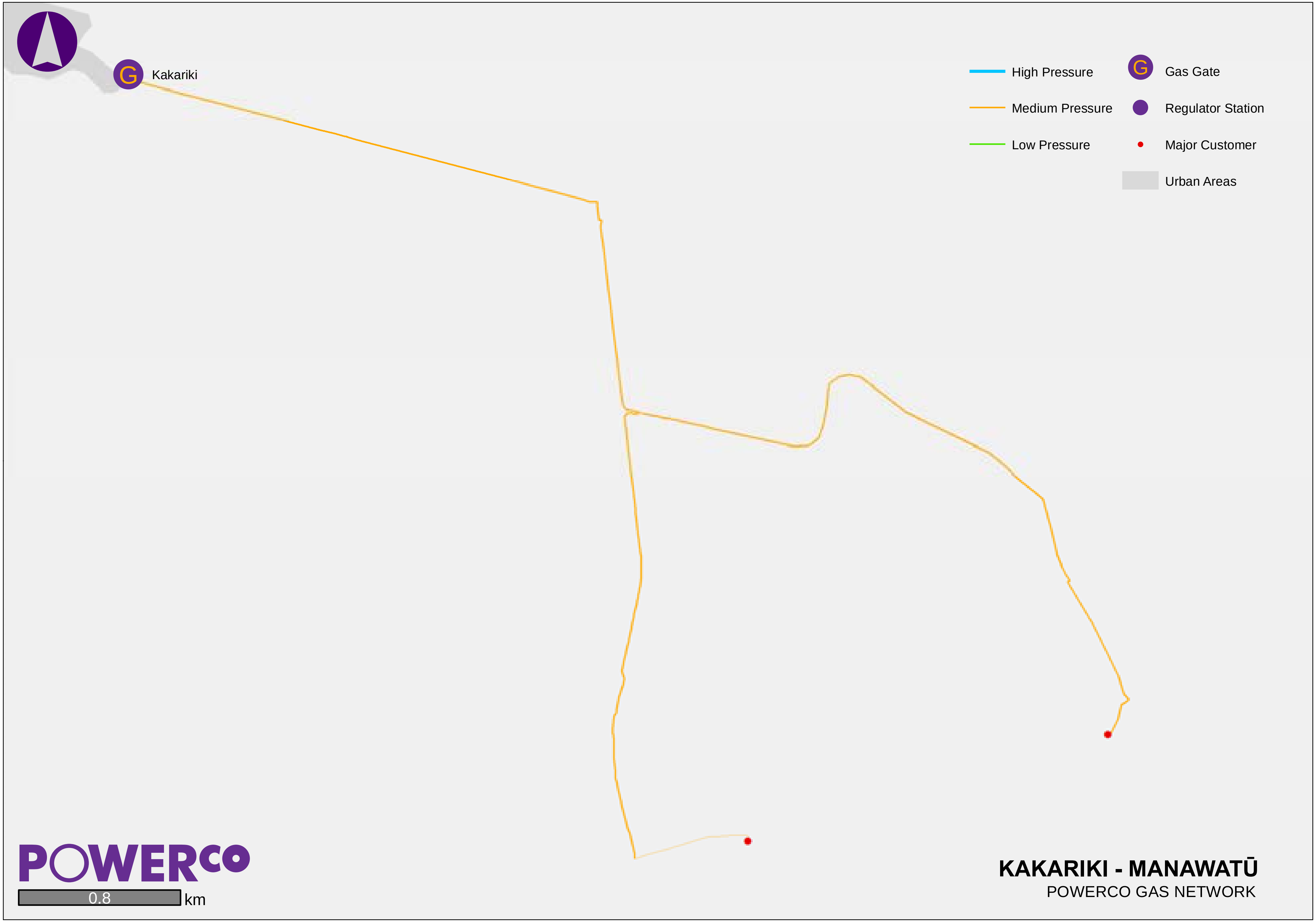
POWERCO GAS NETWORK

FOXTON - MANAWATŪ

POWERCO GAS NETWORK

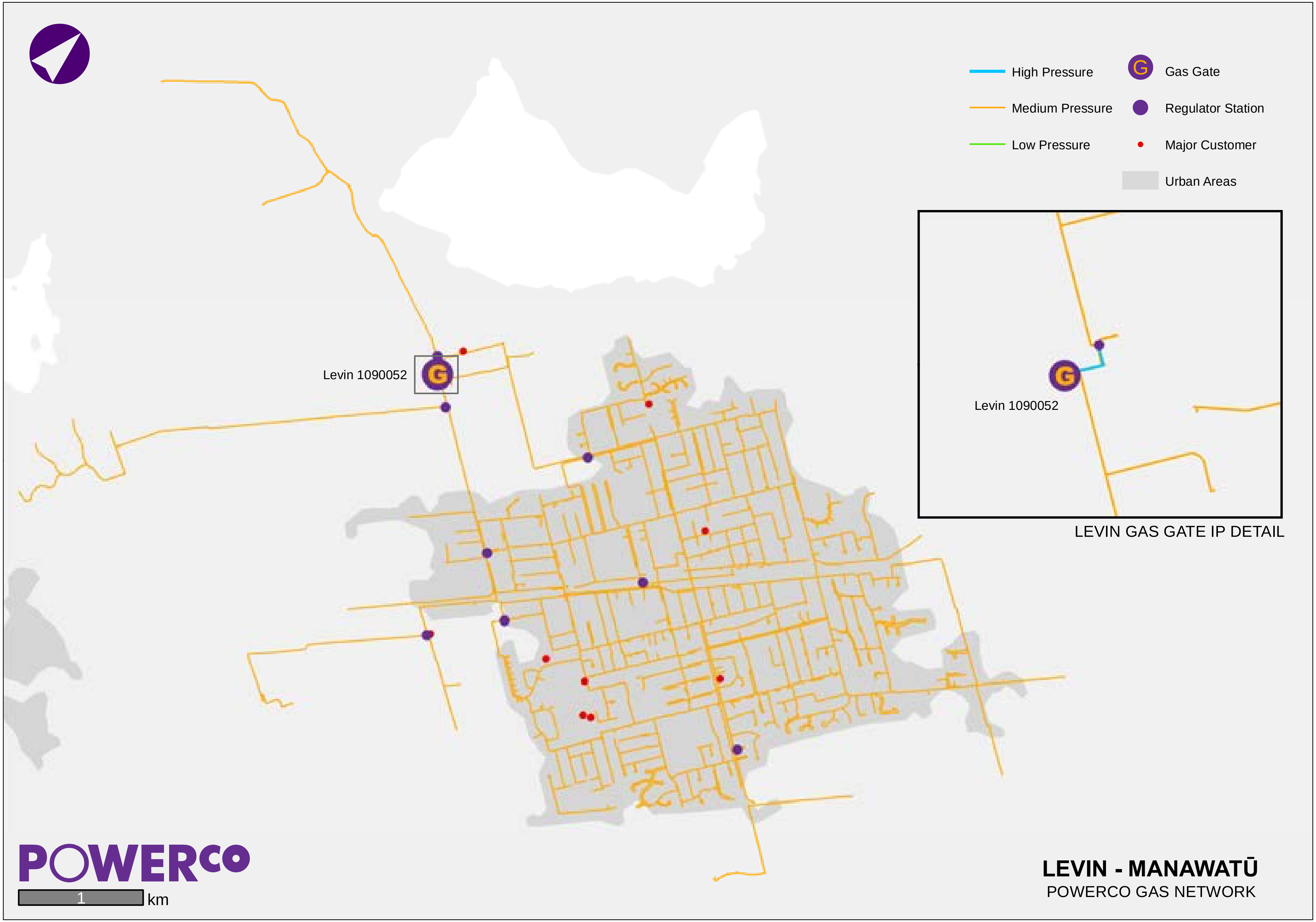
KAIRANGA - MANAWATŪ

POWERCO GAS NETWORK



KAKARIKI - MANAWATŪ

POWERCO GAS NETWORK

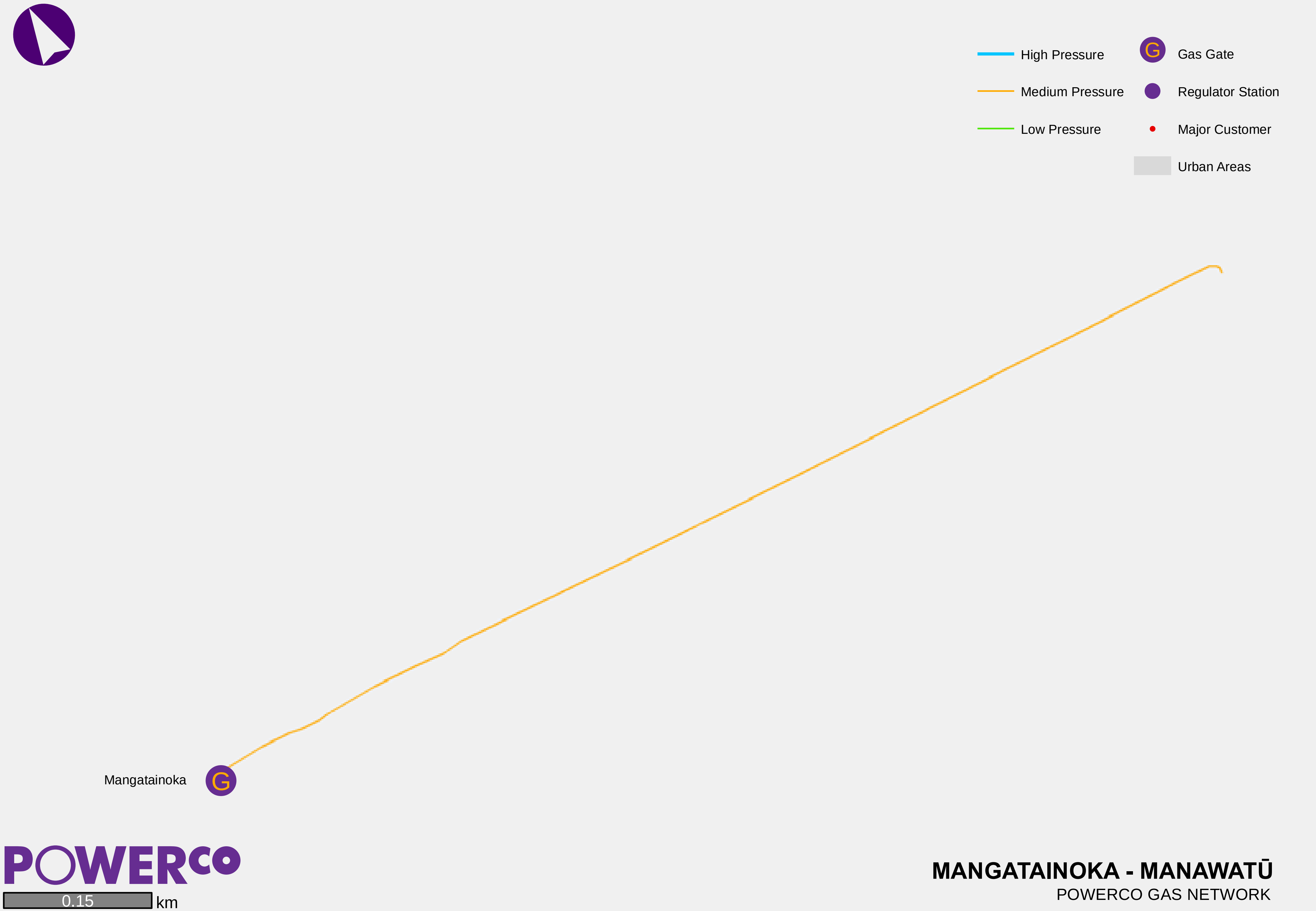


LEVIN - MANAWATŪ

POWERCO GAS NETWORK

LONGBURN - MANAWATŪ

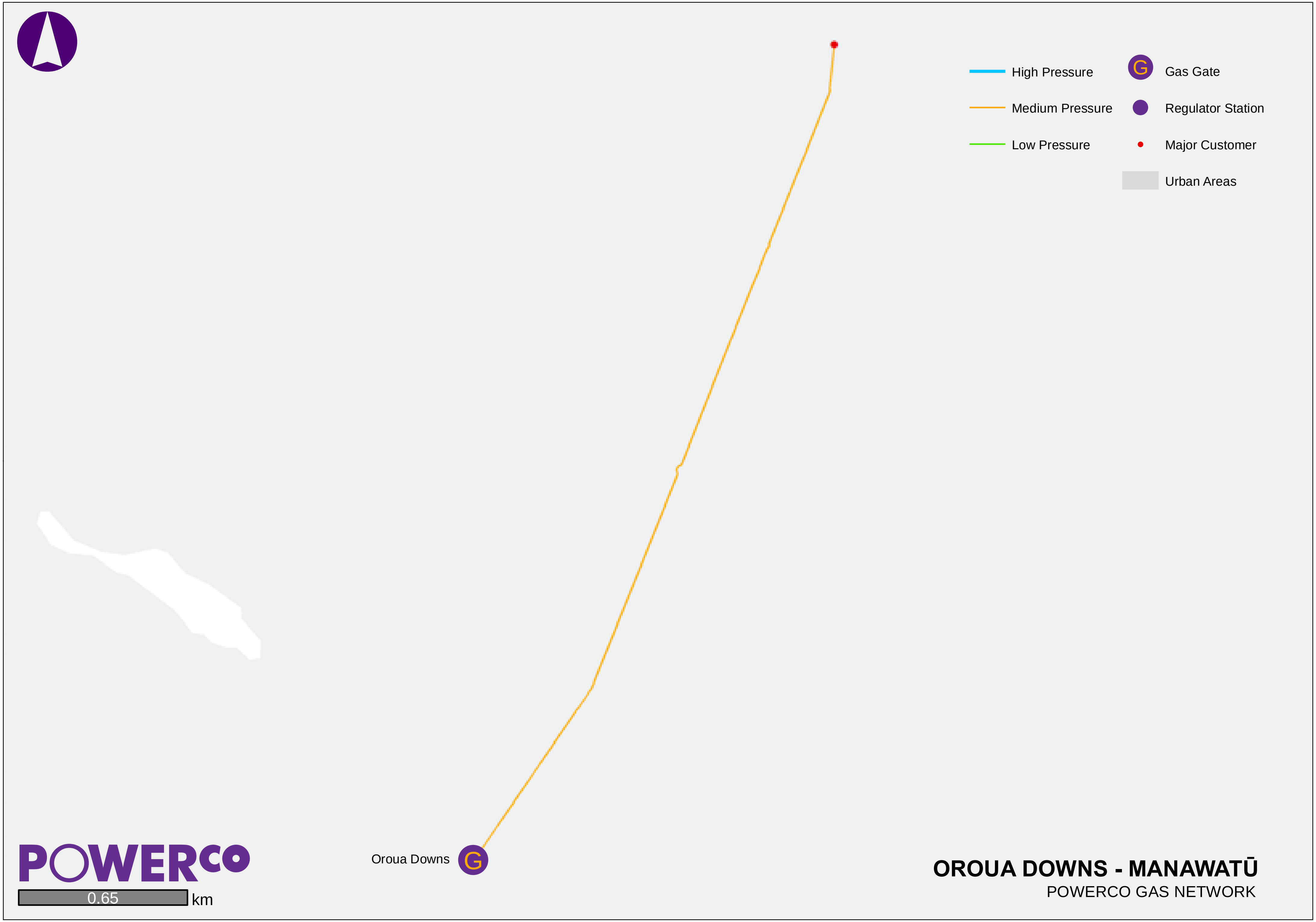
POWERCO GAS NETWORK



POWERCO

MANGATAINOKA - MANAWATŪ

POWERCO GAS NETWORK

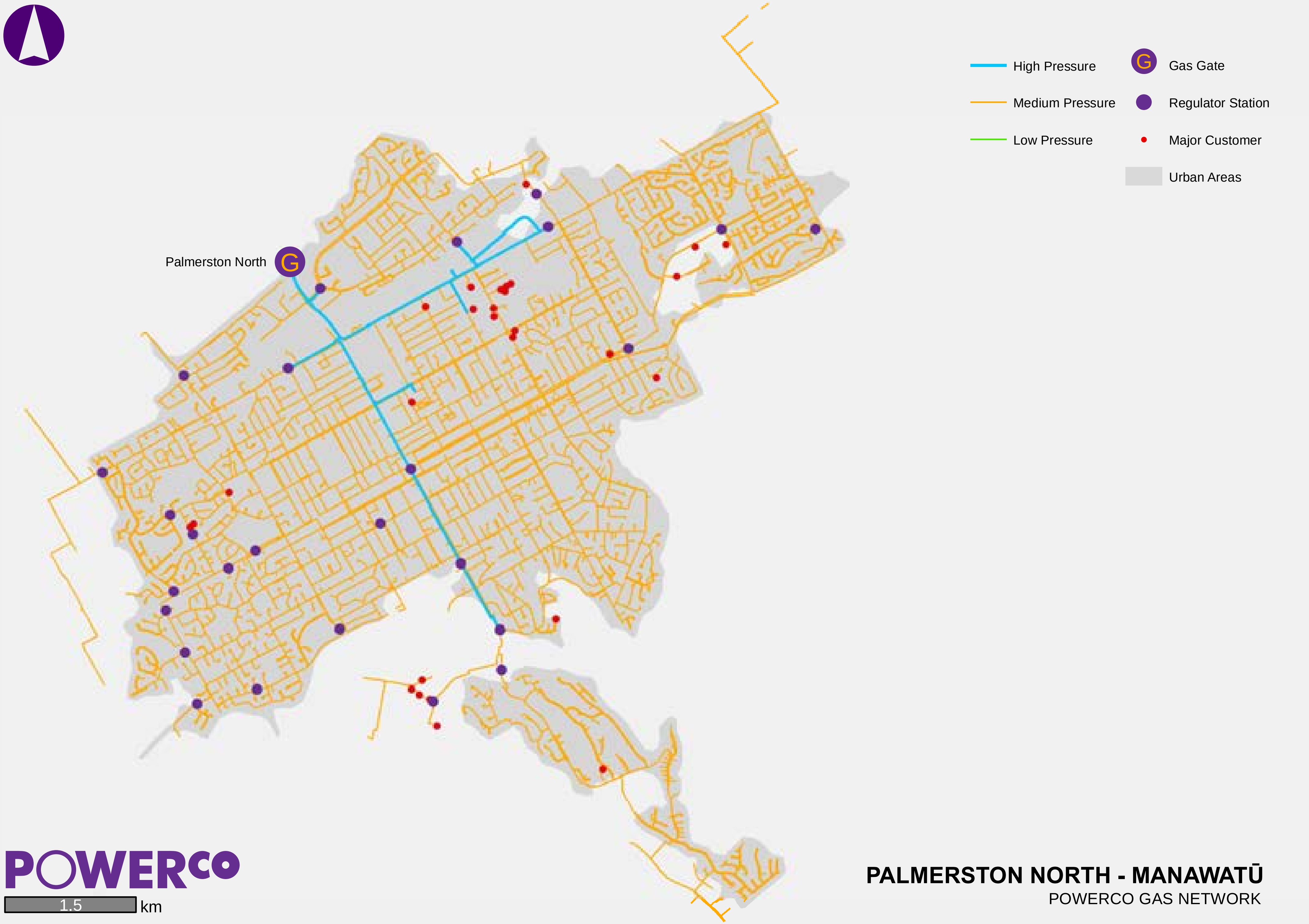


OROUA DOWNS - MANAWATŪ

POWERCO GAS NETWORK

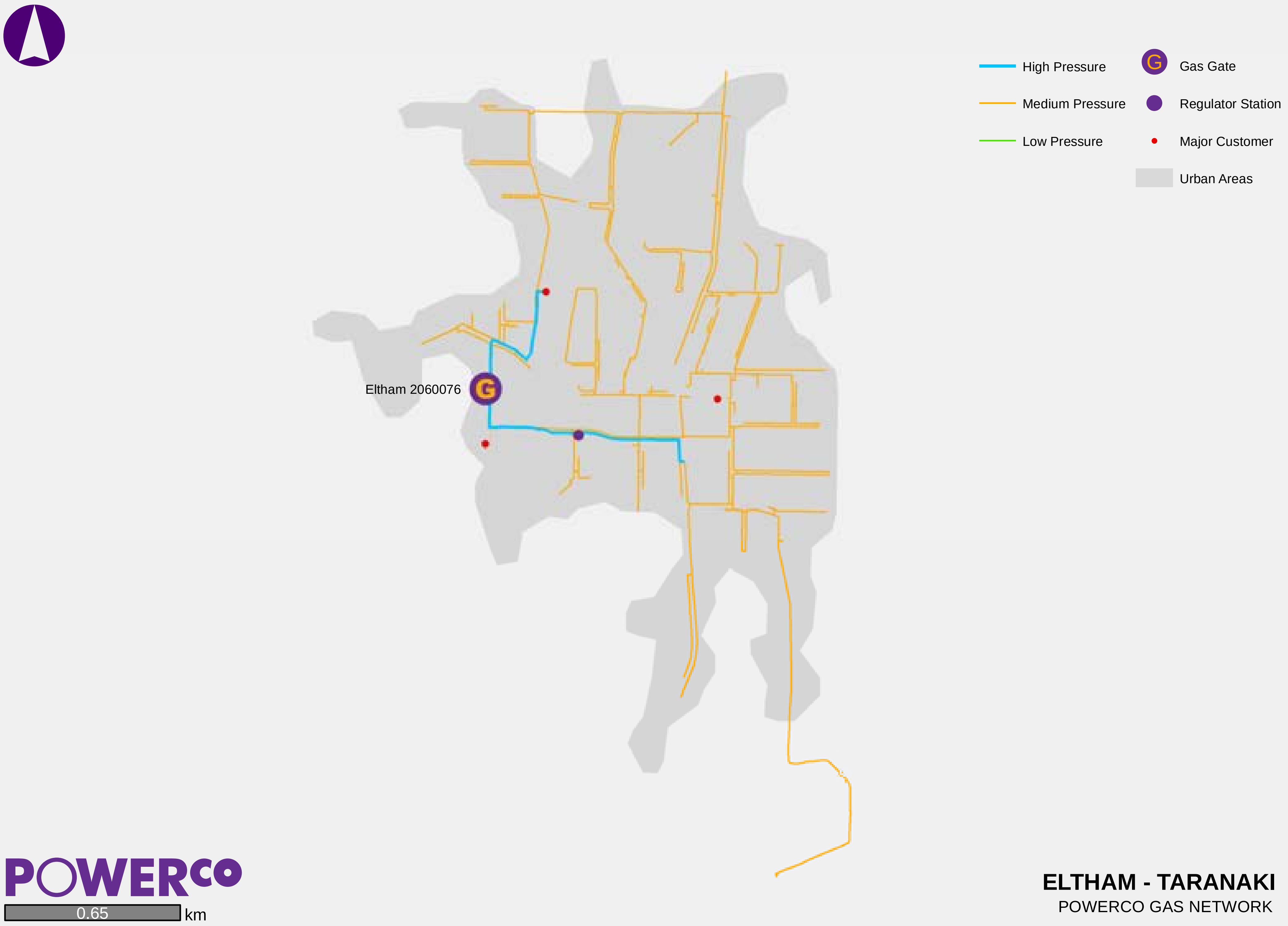
PAHIATUA - MANAWATŪ

POWERCO GAS NETWORK



PALMERSTON NORTH - MANAWATŪ

POWERCO GAS NETWORK



ELTHAM - TARANAKI

POWERCO GAS NETWORK

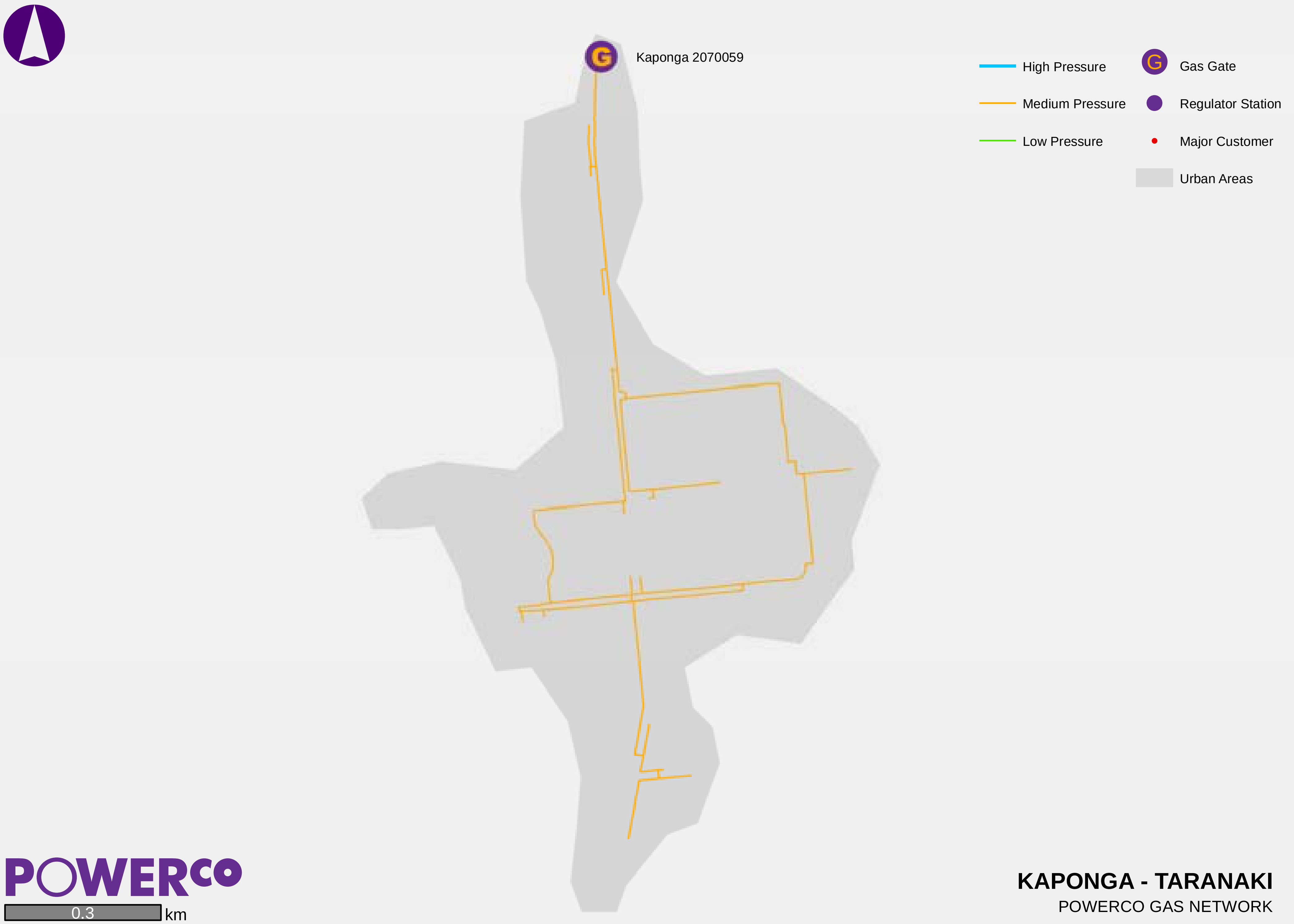
HĀWERA - TARANAKI

POWERCO GAS NETWORK

POWERCO

INGLEWOOD - TARANAKI

POWERCO GAS NETWORK



POWERCO

KAPONGA - TARANAKI

POWERCO GAS NETWORK

KAPUNI - TARANAKI

POWERCO GAS NETWORK

MANAIA - TARANAKI

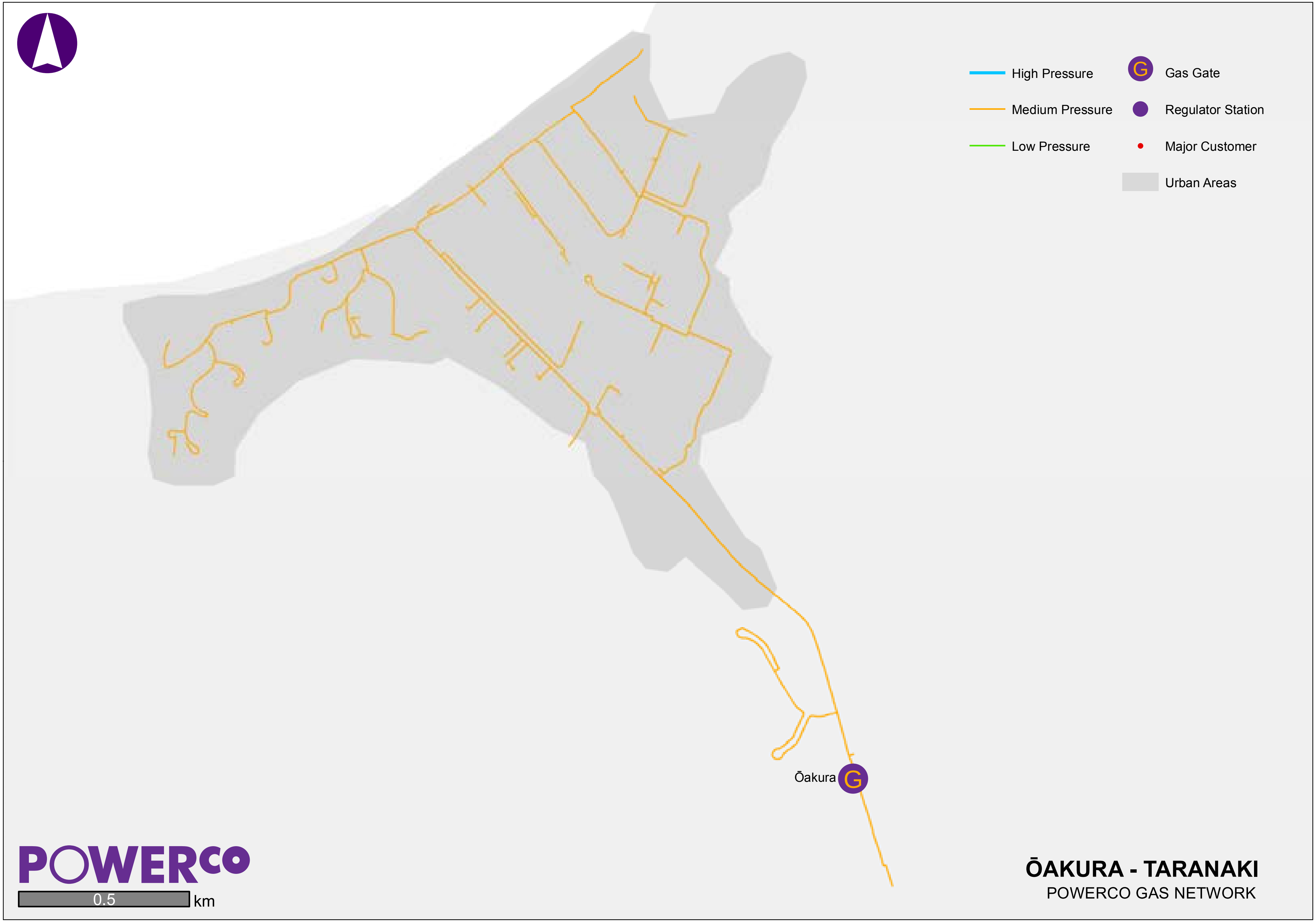
POWERCO GAS NETWORK

MATAPU - TARANAKI

POWERCO GAS NETWORK

NEW PLYMOUTH - TARANAKI

POWERCO GAS NETWORK

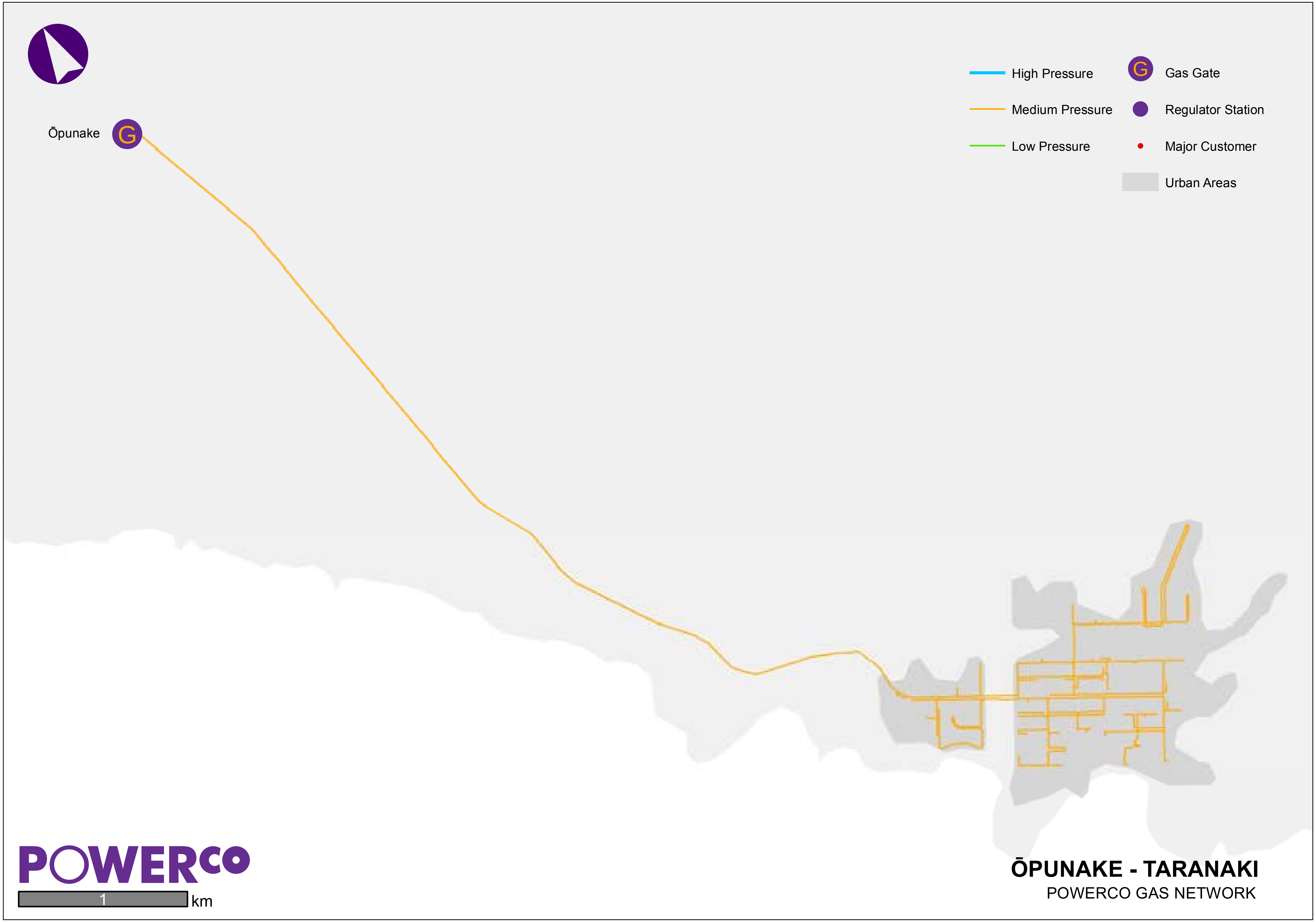


ŌAKURA - TARANAKI

POWERCO GAS NETWORK

ŌKATO - TARANAKI

POWERCO GAS NETWORK



POWERCO

ŌPUNAKE - TARANAKI

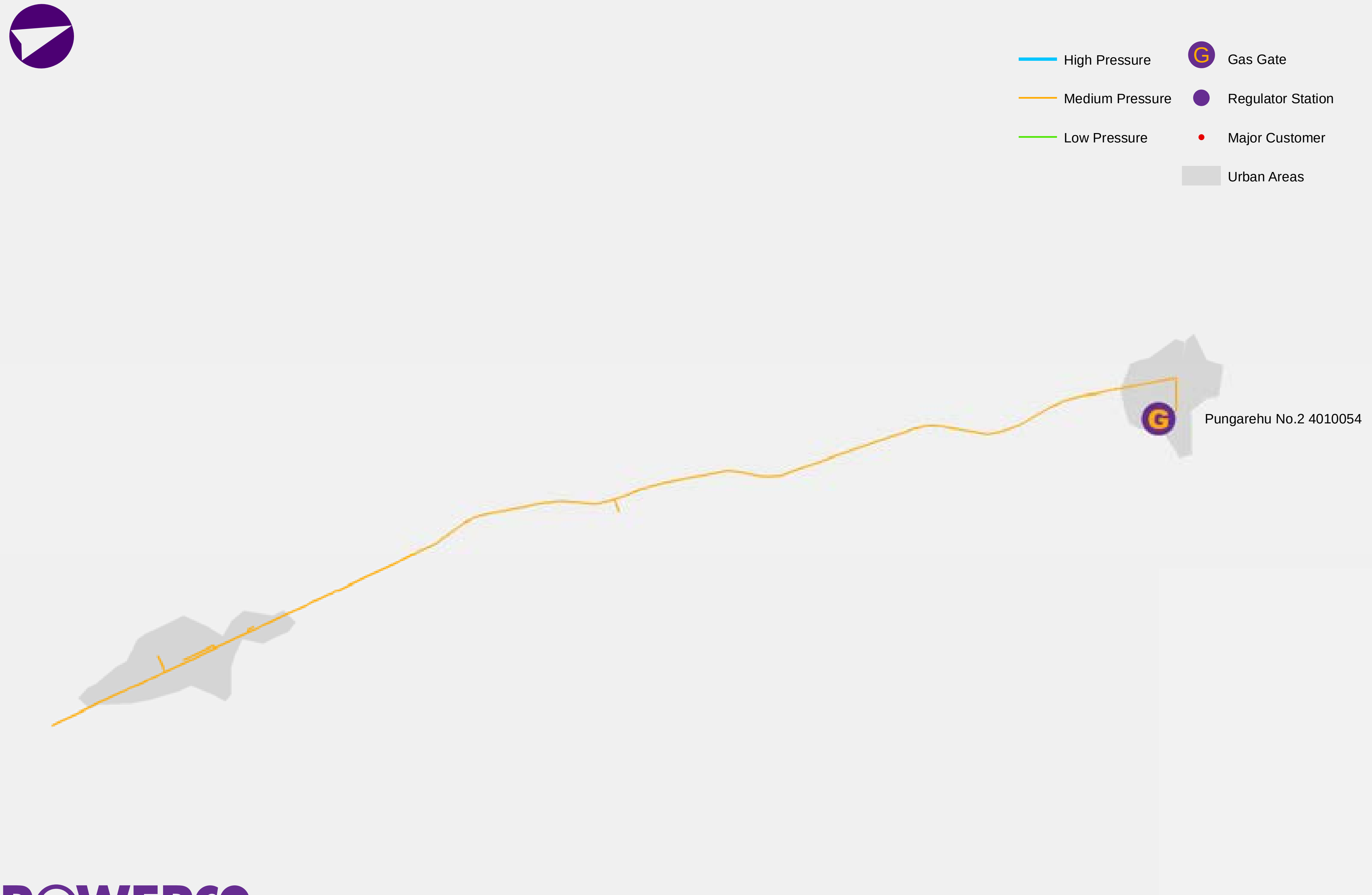
POWERCO GAS NETWORK

PĀTEA - TARANAKI

POWERCO GAS NETWORK

PUNGAREHU #1 -TARANAKI

POWERCO GAS NETWORK

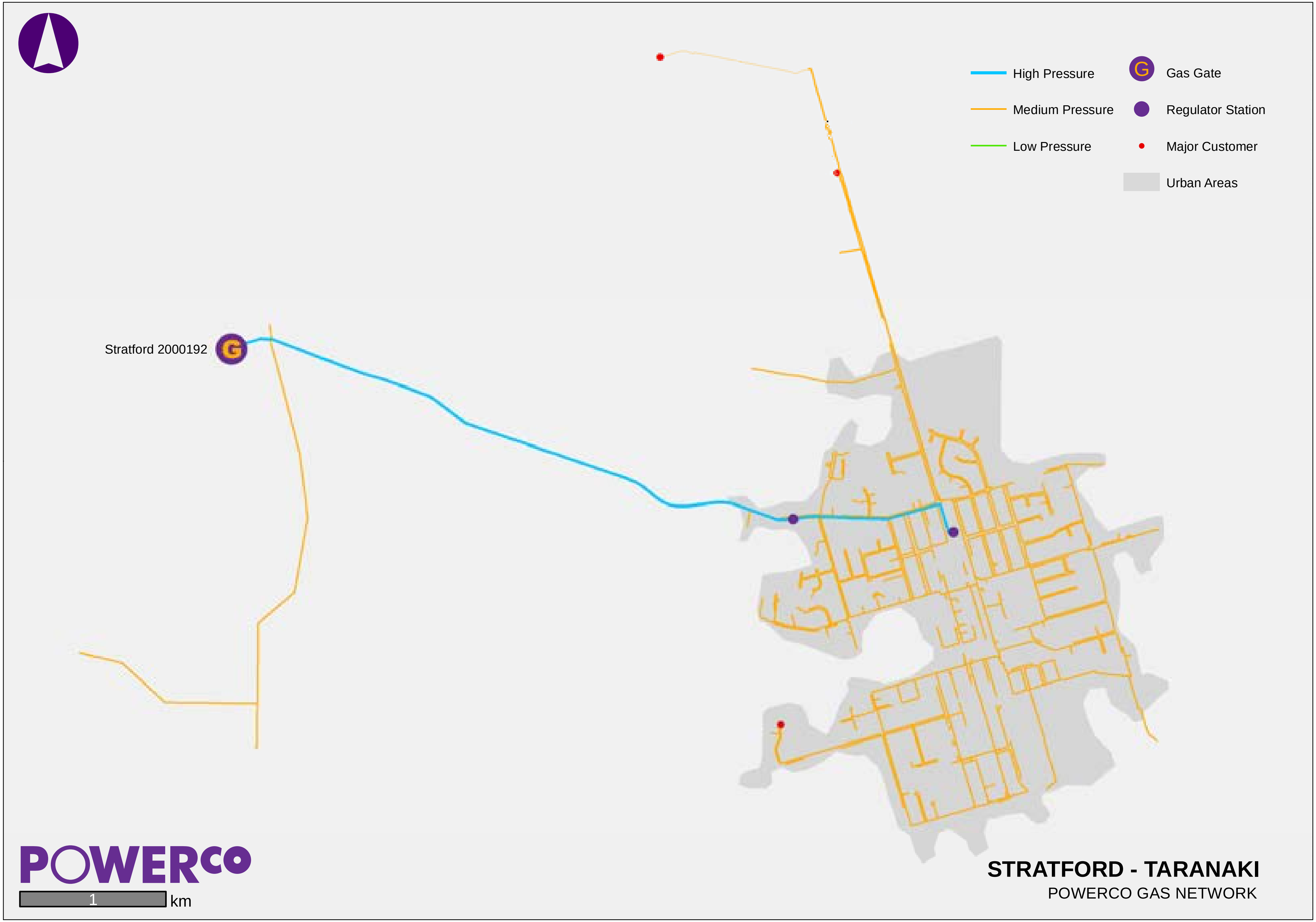


PUNGAREHU #2 - TARANAKI

POWERCO GAS NETWORK

STRATFORD - TARANAKI

POWERCO GAS NETWORK



WAITARA - TARANAKI

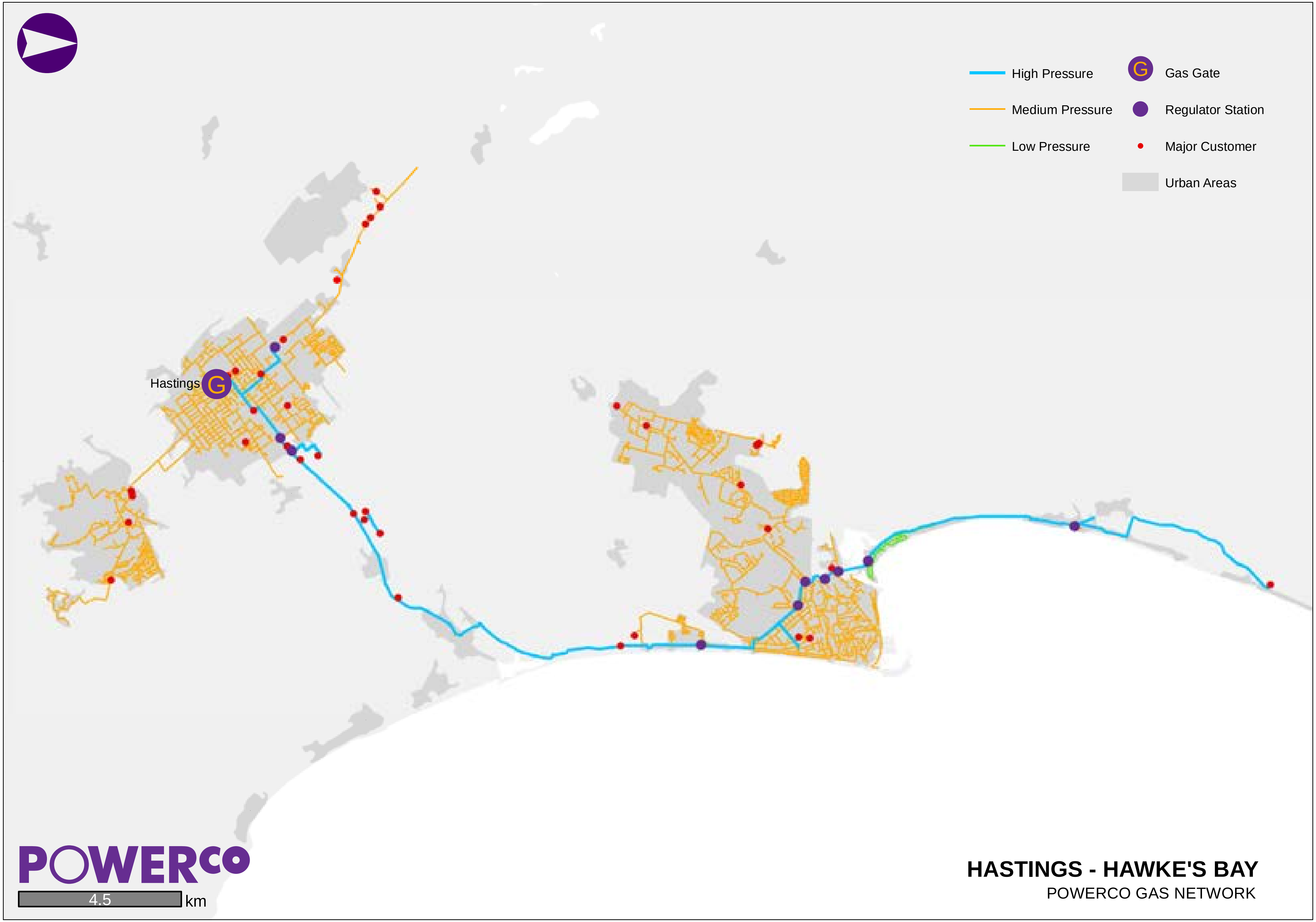
POWERCO GAS NETWORK

POWERCO

0.35 km

WAVERLEY - TARANAKI

POWERCO GAS NETWORK



HASTINGS - HAWKE'S BAY

POWERCO GAS NETWORK

Appendix 7 – Works programme completion

This appendix provides an overview of our progress against physical and financial plans set out in the 2022 AMP. The year in the tables below refers to the financial year, unless stated otherwise. The year is the forecast completion date for projects, or the actual date for those completed.

7. Overview

Any significant differences described in this appendix are where a project has been (relative to the 2022 AMP):

- Identified because of condition or some other reason that was not identified in the 2022 AMP.
- Accelerated, i.e., scheduled capital expenditure (Capex) and reactive Capex.
- Deferred (roll over).
- Cancelled, as the need is no longer required or because of a significant change in scope, i.e. slower than anticipated growth has removed the need for some projects.
- Reprioritised because of reduction in capital renewal expenditure requiring reprioritisation of specific programmes of work, or in line with our Volume to Value Strategy.
- Projects identified that specifically relate to adaptation and resilience improvement opportunities.

Significant changes outlined in this appendix are related to the following expenditure type:

- System growth (GRO).
- Asset replacement and renewal (ARR).
- Quality of supply (QOS).
- Other reliability, safety and environment (ORS).

In summary, we completed 80% of our scheduled capital works programme for FY23 and, overall, completed 99.5% of our maintenance and inspection programme.

7.1 Wellington

Significant changes in the Wellington region are summarised in Table 7.1. The reasons for the changes are described in more detail below.

Table 7.1: Wellington 2022 AMP v 2023 AMP summary of project adjustments

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	Middleton DRS	2023	FY2024 construct Nov-Dec 2023	$500k	~$630k (estimate)
GRO	Westchester Drive overlay	2023	FY2023 construct completed	$400k	$395k
ORS	Butavas Street DRS removal	2024	FY2024 design and construct Dec 2023	$50k	~$16k
ARR	Karori and Chaytor station renewals x2	2026	FY2024 Design – Oct 2023 Construct – Mar 2024	$75k	~$240k

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	Regulator swaps x2	2023	FY2024 construct Nov 2023	$100k	~$90k
ARR	Simla Crescent renewal	2024	FY2024 construct Sept 2023	$350k	~$110k
ARR	Taylor Preston DRS renewal	2023	FY2024 construct Feb 2024	$200k	~$200k
ARR	Queens Wharf DRS renewal	2023	FY2023 construct completed	$500k	$465k

Middleton DRS renewal was deferred because of a change in scope to a full replacement underground station and retaining wall rebuild. This has resulted in increased construction costs.

Butavas Street removal to decommission the station in 2024. A trial completed under 2022 winter demand conditions was completed confirming this poor-condition station can be removed without customer pressure impacts.

Karori rationalisation has been cancelled in favour of a more economic station renewal in 2024 for the core functional components of the Karori and Chaytor stations. The budget for the station renewals is relatively modest but is required to maintain safe and reliable operation of both stations.

Regulator swaps will be performed at two stations (Ohiro and Wilton DRS) that have outdated regulators and there are no longer spare parts available. This is an example of new work that has been enabled by changes made to the Station Design Standard following its review in 2022.

Simla Crescent DRS is a renewal of obsolete regulators and an upgrade of the existing SCADA station. Under the Volume to Value Strategy, the scope of works was reduced from a complete station replacement to parts refurbishment only.

Taylor Preston PRS involves replacing the corroded existing station and GMS into a new combined station. Work will take place in the summer of 2024 to avoid damaging the dirt tracks around this large commercial customer.

Queens Wharf DRS was a complete station replacement of the existing above ground station with a new underground regulator station. Most of the works were completed before the end of FY23.

7.2 Hutt Valley and Porirua

Significant changes in the Hutt Valley and Porirua region are summarised in Table 7.2. The reasons for the changes are described in more detail below.

Table 7.2: Hutt Valley and Porirua 2022 AMP v 2023 AMP summary of project adjustments

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	Avalon rationalisation	2023	FY2023 construct completed	$1.47m	$1.47m

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	Linden Avenue DRS renewal	2024	FY2023 construct completed	$200k	$357k
ARR	Whites Line East special crossing	2023	FY2024 construct ~Nov-Dec 2023	$300k	~$100k

Avalon rationalisation was a complex construction project that had four stages – mains laying, new underground regulator station installation, new tie-in, and above ground station decommissioning and demolition. The works were completed in FY23.

Linden Avenue DRS was a district regulator station replacement from above ground to underground station and the works were completed in late FY23. The cost of this project is consistent with that of a typical Cocon-13 underground regulator station, in terms of materials supply and labour.

Whites Line East special crossing renewal involves replacing the existing corroded casing with new in-situ casing and crossing. This work is scheduled for late 2023.

7.3 Hawke's Bay

Significant changes in the Hawke's Bay region are summarised in Table 7.3. The reasons for the changes are described in more detail below.

Table 7.3: Hawke's Bay 2022 AMP v 2023 AMP summary of project adjustments

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	Ngaruroro River Bridge bracket replacement	2023	FY2024 design FY2025 construct	$310k	~$1m

Ngaruroro River Bridge special crossing involves investigating all real options available that would meet the new network adaptation and resilience strategy. This includes putting the strategic LIP pipe underground, running the LIP pipes on the downstream side of the stream, or replacing the existing brackets with new brackets, like those used at Meeanee Quay and Waione Bridge.

7.4 Manawatū

Significant changes in the Manawatū region are summarised in Table 7.4. The reasons for the changes are described in more detail below.

Table 7.4: Manawatū 2022 AMP v 2023 AMP summary of project adjustments

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	Havelock Avenue steel isolation improvement stage 1*	2023	FY2023 construct completed	$1.5m	~$77k
QOS	Palmerston North (PN) East rationalisation	2023	FY2023 construct completed	$250k	$ 369k
QOS	PN West rationalisation	2030	2030	$1.1m	Nil

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	Levin gate station renewal	2023	FY2024 construct Mar 2024	$200k	~$200k
ARR	Steel replacement – Carter Crescent	2024	Paused	$450k	Nil

Havelock Avenue steel replacement has been rescoped as a valve sectorisation project because of the high costs to replace unreinforced steel pipes. Future leaks on steel pipes will be managed by the new Ravetti & LokRing isolation tools that will be rolled out in late 2023.

PN East rationalisation was a new Cocon-13 underground station installation and the removal of redundant PRS around Palmerston North CBD. The works were completed in late 2023.

PN West rationalisation is likely to be split into smaller sub-projects over several financial years. This will allow the work to be coordinated with general station renewal in the years leading up to 2030.

Levin gate station was found to be in poor condition in a scheduled inspection in 2022. Isolation valves for both lines are seized, corrosion is advanced on the above ground pipework, the underground relief line is non-CP protected, and the station is leaking at a low rate. The station is scheduled for regulator refurbishment in Q4 FY24.

Steel replacement – Carter Crescent was paused following the re-evaluation of Copeland Street pre-85 and Havelock Avenue steel replacement against the Volume to Value Strategy and investment tool to determine the most economical time for intervention. The number of leaks per metre did not justify the capital cost of investment.

7.5 Taranaki

Significant changes in the Taranaki region are summarised in Table 7.5. The reasons for the changes are described in more detail below.

Table 7.5: Taranaki 2022 AMP v 2023 AMP summary of project adjustments

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
GRO	Hutchen Place reinforcement	2023	Cancelled	$150k	$119k

Hutchen Place reinforcement project involved installing a new PRS at Bayly Road to reinforce supply to Port Taranaki. Unfortunately, prolonged iwi consenting, and unconfirmed customer growth, meant the project was no longer justified and cancelled. The PRS will be deployed to a new future design while sunk costs will be written off.

7.6 All regions pressure isolation upgrades

Significant changes to the pressure isolation upgrade programme are summarised in Table 7.6. The reasons for the changes are described in more detail below.

Table 7.6: 2022 AMP v 2023 AMP summary of project adjustments

Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	HVP – Belmont HIP corroded isolation valves	2023	FY2024 construct Dec 2023-Feb 2024	$500k	~$700k
ORS	HVP – Belmont MP sector plans	2025	FY2025-2027	$120k	Nil
ORS	TAR – New Plymouth MP West sector plans	2025	Completed by end of FY2024	$290k	Nil
	TAR – New Plymouth MP South sector plans	2026	Completed by end of FY2024		Nil
ORS	HAB – Napier MP sectors	2025	FY2024 construct Feb 2024	$55k	~$50k
ORS	TAR – New Plymouth IP sector plans	2023	Completed by end of FY2024	$400k	Nil
ORS	HAB – Hawke's Bay IP isolation plans	2025-2030	2025-2026	$200k	Nil
ORS	HVP – Porirua IP isolation plans	2026-2031	2024 & 2026-2038	$640k	Nil
ORS	HVP – Belmont IP isolation plans	2024-2031	2024 & 2027-2030	$1.1m	Nil

Belmont HIP valves project involves installing two new above ground HIP valves on the existing pipework while installing a temporary bypass pipe from First Gas to Powerco at Belmont, as well as installing new temporary bypass pipes at Dowse Drive, Riddlers Crescent and Sunshine Crescent DRS. The work is estimated to take place from December 2023 to February 2024.

Taranaki MP sectorisation retrofits work programme is intentionally being spaced over several years and prioritised according to our decision-making framework and outputs of the Te Puni Kāpuni (Issues Register) to populate the Gas Works Plan (GWP).

Napier MP sectorisation retrofits is scheduled for early 2024.

The **IP isolation upgrades** across all regions require detailed design and procurement of steel valves with very long lead times. The works programme will also be evenly spaced out over the years and prioritised according to our decision-making framework and outputs of the Te Puni Kāpuni (Issues Register) to populate the GWP.

7.7 Pre-85 projects

Significant changes to the Pre-85 replacement programme are summarised in Table 7.7. The reasons for the changes are described in more detail below.

Table 7.7: 2022 AMP v 2023 AMP summary of project adjustments

Project name – Pre-85 replacement	Region	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
Henry Street	HVP	2023	Paused	~$1.2m/year	Nil
Copeland/Pilmuir		2023	Paused		Nil
Truro/Bodmin		2022	FY2022 construct completed		$637k
Stokes Valley Road		2024	Paused		N/A
Waddington Drive		2024	FY2024 construct completed		$210k
Knights/Wilford		2024	Paused		Nil
Ulric Street		2023	FY2023 construct completed		$388k
Jamaica Drive		2023	FY2023 construct completed		$795k
Roband/Shanly		2023	Paused		Nil
Onepoto		2022	FY2022 construct completed		$931k
Woodvale		N/A	FY2024 construct Nov-Dec 2023		$430k
Harbour View	HVP	2024	FY2024 construct Feb-Mar 2024	~$900k	$350k
Rakaia Grove		2024	Paused		Nil
Stanhope Grove		2024	FY2024 construct Sept-Oct 2023		$320k
Omapere Street		2024	FY2024 construct completed		$250k

Paused projects including **Henry Steet, Copeland/Pilmuir, Stokes Valley Road, Knights/Wilford, Roband/Shanly,** and **Rakaia Grove** have been revised against our Volume to Value Strategy and investment tool. Condition and leak data has been reviewed and assessed using a failure mode and effects analysis to understand when the point of failure threshold has been met. For pre-85 replacement, the point of failure has shifted from 1.5 to three leaks per kilometre of pipe. To mitigate potential risk and performance impacts on the network, in these cases, the best way to effectively optimise our cost of ownership between repairing leaks prior to replacement in these cases is to continue reactive repair. The need for these projects will be reviewed again in 2024.

7.8 Cathodic Protection (CP) renewal and upgrade

Significant changes to the CP renewal and upgrade programme are summarised in Table 7.8. The reasons for the changes are described in more detail below.

Table 7.8: 2022 AMP vs 2023 AMP summary of project adjustments

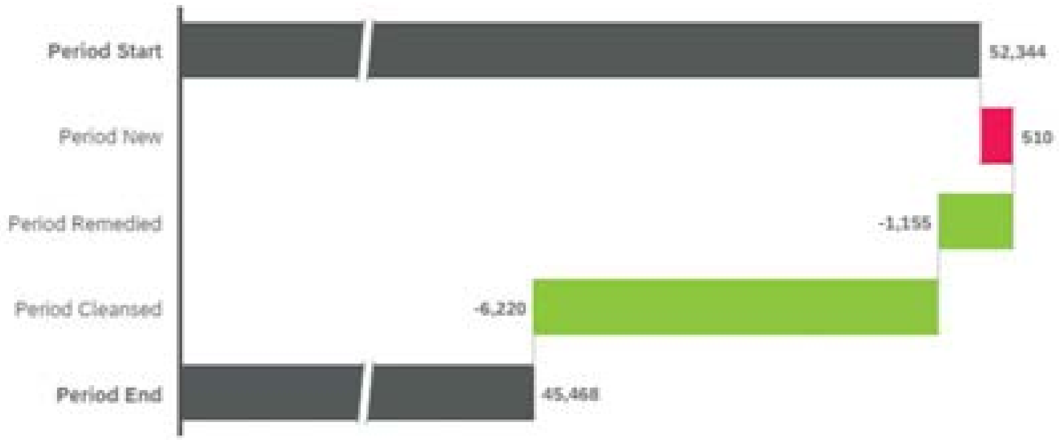
Type	Project name	2022 AMP	2023 AMP status	2022 AMP $	2023 AMP $
ARR	Wellington IP CP	2023	FY2023 construct completed	$1.6m	~$800k
ARR	Upper Hutt IP CP	2023	FY2024 construct	$370k	~$150k
ARR	Lower Hutt IP CP	2024	FY2025 construct	$320k	N/A
ARR	New Plymouth IP CP	2025	FY2026 construct	$290k	N/A
ARR	Hāwera MP CP	2025	FY2027 construct	$180k	N/A
ARR	Hastings IP CP	2026	FY2026 construct	$160k	N/A

The **CP system** renewal projects are a series of projects that have been running since FY20. Faults have been traced to various other utility owners' assets imparting or draining the charge off the pipe. Once the fault has been found it is isolated/repaired, but the investigations have been time consuming. The CP system layout has been reconfigured, which has improved the charge readings, but problems persist in maintaining charge in the desired range. The exact timing for these projects is still in the planning stages.

7.9 Maintenance programme delivery

For the FY23 maintenance programme, we completed 99.5% of the maintenance we had planned to carry out and 45,555 inspections activities. At the start of the year, we had 52,344 asset defects to address across our network, identified through site visits, planned inspections and maintenance activities. Our field crews reported another 510 during their work. During the period, 1,155 defects were addressed, and 6,220 were cleansed (removed). The cleansing included the removal of minor defects that were created automatically from historical maintenance activities, which are now captured elsewhere in our systems. This has assisted our staff and field crews to focus on the defects of importance. The FY23 maintenance programme progress against defects raised is shown in Figure 7.1.

Figure 7.1: FY2023 maintenance programme progress against defects

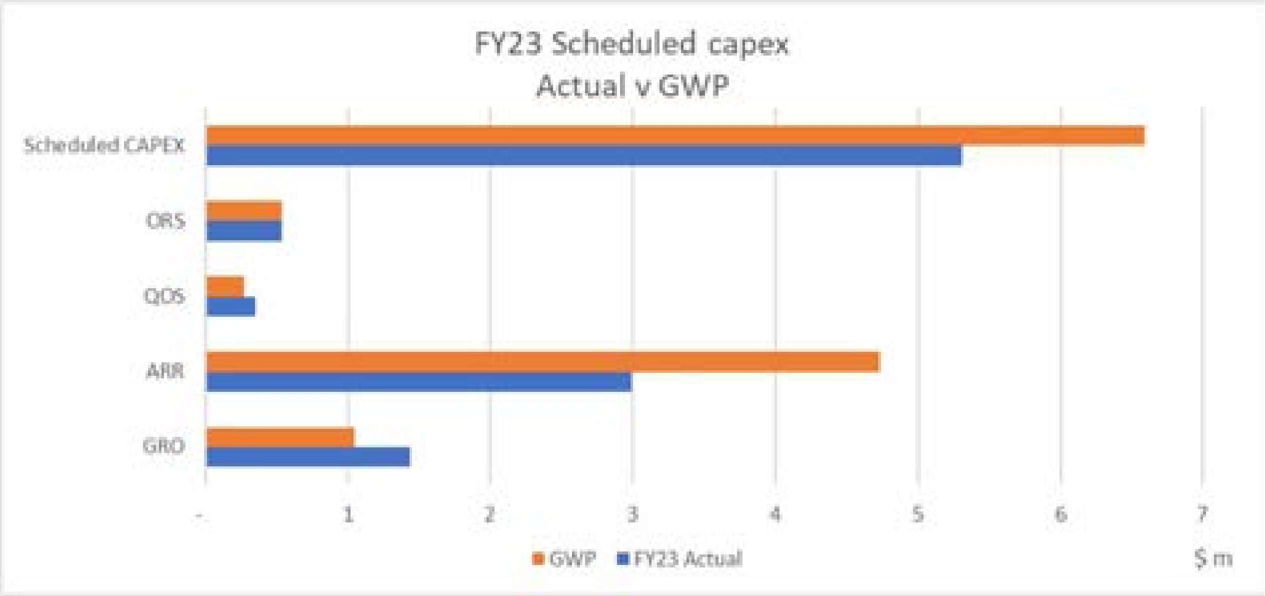


7.10 Financial progress against plan

7.10.1 Scheduled Capex spend

Total scheduled Capex for FY23 ($5.3m) was below the 2022 AMP forecast and FY23 GWP budget ($6.59m) by $1.28m (~20%). The underspend was a combination of overspend and underspend in all areas, as shown in Figure 7.2.

Figure 7.2: Scheduled Capex variance planned v actual FY23 (1 April to 31 March)



Asset replacement and renewal (ARR) expenditure was less than forecast by $1.9m (~39%). This variance represents projects, such as pre-85 and steel replacement projects, that were re-evaluated against our Volume to Value Strategy and investment tool to determine the most economical time for intervention.

Growth (GRO) expenditure is slightly higher than forecast because of the complexity of the design and construction of the Havelock North reinforcement project. The changes to alignment and excavation methodology in certain areas has resulted in additional variation costs incurred to complete the works.

Appendix 8 – Regulatory requirements look-up

2.6 Asset management plans and forecast information	**AMP chapter where addressed**
Disclosure relating to asset management plans and forecast information	
2.6.1 Subject to clauses 2.6.3 and 2.13, before the start of each disclosure year commencing with the disclosure year 2014, every GDB must: 1. Complete an AMP that: a) relates to the gas distribution services supplied by the GDB; b) meets the purposes of AMP disclosure set out in clause 2.6.2; c) has been prepared in accordance with Attachment A to this determination; Gas Distribution Information Disclosure Determination 2012 – (consolidated in 2018); d) contains the information set out in the schedules described in clause 2.6.6; e) contains the Report on Asset Management Maturity as described in Schedule 13; 2. Complete the Report on Asset Management Maturity in accordance with the requirements specified in Schedule 13; 3. Publicly disclose the AMP.	1. a) The AMP relates to gas distribution services, as stated in Chapter 3. b) Compliance with 2.6.2 is outlined in the row below. c) Compliance with Attachment A is outlined in the table below. d) The tables required by clause 2.6.6 are in Appendix 3 Disclosure Schedules, and the MS Excel schedules have been supplied to the Commission. e) The report required is provided in Schedule 13, and the MS Excel schedules have been supplied to the Commission. 2. Schedule 13 is provided and is also discussed in Chapter 4. 3. This Asset Management Plan and its appendices are publicly available on Powerco's website (www.powerco.co.nz) and sent to the Commission.
2.6.2 The purposes of AMP disclosure referred to in subclause 2.6.1(1)(b) are that the AMP: 1. Must provide sufficient information for interested persons to assess whether - a) assets are being managed for the long term; b) the required level of performance is being delivered; c) costs are efficient and performance efficiencies are being achieved; 2. Must be capable of being understood by interested persons with a reasonable understanding of the management of infrastructure assets; 3. Should provide a sound basis for the ongoing assessment of asset-related risks, particularly high impact asset-related risks.	1. & 2. Powerco recognises that AMPs are large and complicated documents. To assist with ease of understanding we have: - Structured the AMP, as described in Chapter 4; - Included our Network Asset Management Policy in Chapter 4 to reiterate our commitment to being cost efficient; - Provided a glossary in Appendix 2 to assist with understanding. 3. Risks are discussed in Chapter 4 and Appendix

2.6 Asset management plans and forecast information	AMP chapter where addressed
Clauses 2.6.3 to 2.6.5 relate to AMP updates	Not relevant
2.6.6 Subject to clause 2.13.2, before the start of each disclosure year, each GDB must complete and publicly disclose each of the following reports by inserting all information relating to the gas distribution services supplied by the GDB for the disclosure years provided for in the following reports: 1. The Report on Forecast Capital Expenditure in Schedule 11a; 2. The Report on Forecast Operational Expenditure in Schedule 11b; 3. The Report on Asset Condition in Schedule 12a; 4. The Report on Forecast Utilisation in Schedule 12b; 5. The Report on Forecast Demand in Schedule 12c.	These reports are included in Appendix 3 Disclosure Schedules. They are publicly available on Powerco's website (www.powerco.co.nz) as part of the Asset Management Plan and sent to the Commission by 30 September 2023.

Attachment A: Asset management plans	AMP chapter where addressed
AMP design	
1. The core elements of asset management: 1.1. A focus on measuring network performance, and managing the assets to achieve performance targets; 1.2. Monitoring and continuously improving asset management practices; 1.3. Close alignment with corporate vision and strategy; 1.4. That asset management is driven by clearly defined strategies, business objectives and service level targets; 1.5. That responsibilities and accountabilities for asset management are clearly assigned; 1.6. An emphasis on knowledge of what assets are owned and why, the location of the assets and the condition of the assets; 1.7. An emphasis on optimising asset utilisation and performance; 1.8. That a total lifecycle approach should be taken to asset management; 1.9. That the use of 'non-network' solutions and demand management techniques as alternatives to asset acquisition is considered.	1.1 Chapter 4 outlines asset management objectives, and describes the framework to manage assets to meet these targets. Chapters 3, 4, 5 and 6 describe how we manage our assets. 1.2 Chapters 4 and Schedule 13 provide comments on the Asset Management Maturity Assessment (AMMAT) and detail on Powerco's approach to continuous improvement. 1.3 & 1.4 Chapters 4 and 5 detail the alignment between our corporate vision and objectives, and our asset management strategies. These chapters outline our asset management strategies, objectives and service levels. 1.5 Chapter 4 describes accountabilities. 1.6 Chapter 5 and 6 provide an overview of Powerco's assets, their condition, performance, and location. Chapter 5 provides a detailed description of our assets. 1.7 Chapter 5 discusses asset performance. Chapter 6 discusses asset, and network, utilisation. 1.8 This is discussed throughout Chapters 4, 5 and 6. Each asset lifecycle plan has a renewal strategy that considers the whole-of-life cost of each asset and therefore optimal replacement timing. 1.9 This is discussed in Chapter 6 Table 6.1.

Attachment A: Asset management plans	AMP chapter where addressed
2. The disclosure requirements are designed to produce AMPs that: 2.1. Are based on, but are not limited to, the core elements of asset management identified in clause 1; 2.2. Are clearly documented and made available to all stakeholders; 2.3. Contain sufficient information to allow interested persons to make an informed judgement about the extent to which the GDB's asset management processes meet best practice criteria, and outcomes are consistent with outcomes produced in competitive markets; 2.4. Specifically support the achievement of disclosed service level targets; 2.5. Emphasise knowledge of the performance and risks of assets and identify opportunities to improve performance and provide a sound basis for ongoing risk assessment; 2.6. Consider the mechanics of delivery, including resourcing; 2.7. Consider the organisational structure and capability necessary to deliver the AMP; 2.8. Consider the organisational and contractor competencies and any training requirements; 2.9. Consider the systems, integration and information management necessary to deliver the plans; 2.10. To the extent practical, use unambiguous and consistent definitions of asset management processes and terminology consistent with the terms used in this attachment to enhance comparability of asset management practices over time and between GDBs; and 2.11. Promote continual improvements to asset management practices. *Disclosing an AMP does not constrain a GDB from managing its assets in a way that differs from the AMP if its circumstances change after preparing the plan or if the GDB adopts improved asset management practices.*	2.1 This is discussed throughout the AMP, and specifically in Chapter 4. 2.2 This AMP is widely distributed to Powerco's stakeholders and is publicly available on Powerco's website (www.powerco.co.nz). 2.3 Powerco's self-assessment against the AMMAT is provided in Chapter 4 and Schedule 13. Chapter 4 describes how our alignment with ISO: 55000 meets best practice criteria and outcomes are consistent with outcomes produced in competitive markets. 2.4 Powerco's service level objectives are discussed in Chapter 4. 2.5 This is discussed in Chapters 4, 5 and 6. Risks are presented in Chapter 4 and Appendix 4. 2.6 This is discussed in Chapter 4. 2.7 This is discussed in Chapter 4. 2.8 This is discussed in Chapter 4. 2.9 This is discussed in Chapters 4 and 7. 2.10 Powerco has ensured that the terminology used in our AMP is in alignment with attachment A. To enhance clarity and understanding, we have included a glossary of key terms in Appendix 2. 2.11 Development initiatives are included in Chapters 5 and 6. Comments on the AMMAT and detail on Powerco's approach to continuous improvement are found in Chapter 4.

Attachment A: Asset management plans	AMP chapter where addressed
Contents of the AMP	
3. The AMP must include the following: 3.1 A summary that provides a brief overview of the contents, and highlights information that the GDB considers significant; 3.2 Details of the background and objectives of the GDB's asset management and planning processes; 3.3 A purpose statement which - a) makes clear the purpose and status of the AMP in the GDB's asset management practices. The purpose statement must also include a statement of the objectives of the asset management and planning processes; b) states the corporate mission or vision as it relates to asset management; c) identifies the documented plans produced as outputs of the annual business planning process adopted by the GDB; d) states how the different documented plans relate to one another, with particular reference to any plans specifically dealing with asset management; e) includes a description of the interaction between the objectives of the AMP and other corporate goals, business planning processes, and plans. The purpose statement should be consistent with the GDB's vision and mission statements and show a clear recognition of stakeholder interest.	3.1 Chapter 1 is an executive summary. It provides a brief overview and the key messages and themes in the AMP. 3.1 Chapters 3 and 4 describe Powerco's operating context, which is the background to our objectives in Chapter 4. 3.2 The objectives of Powerco's asset management and planning process are provided in Chapters 4 and 5. 3.3 a) The purpose statement is in Chapter 3. b) Powerco's cultural framework Ngā Tikanga - Our Way, vision and purpose statements are discussed in Chapter 4. Their place in the Asset Management System is described in Chapter 4 in the Network Asset Management Policy. c) & d) Chapters 5 and 6, including projects listed in Appendix 6 – Network maps by region. e) This is described in Chapter 4. The purpose statement in Chapter 3 aligns with Powerco's cultural framework Ngā Tikanga - Our Way, vision and purpose statements, and includes a table of our key stakeholders, such as customers, retailers and investors.
3.4 Details of the AMP planning period, which must cover at least a projected period of 10 years commencing with the disclosure year following the date on which the AMP is disclosed. Good asset management practice recognises the greater accuracy of short-to-medium term planning and will allow for this in the AMP. The asset management planning information for the second five years of the AMP planning period need not be presented in the same detail as the first five years.	3.4 Powerco's AMP planning period is from 1 October 2023 – 31 September 2033 as described in Chapter 3.
3.5 The date that it was approved by the directors.	3.5 The AMP was approved on the 26 September 2023.

Attachment A: Asset management plans	AMP chapter where addressed
3.6 A description of each of the legislative requirements directly affecting management of the assets, and details of - a) how the GDB meets the requirements; b) the impact on asset management.	3.6 a) This is discussed in Chapter 4. b) This is discussed in Chapter 4.
3.7 A description of stakeholder interests (owners, customers etc), which identifies important stakeholders and indicates - a) how the interests of stakeholders are identified; b) what these interests are; c) how these interests are accommodated in asset management practices; d) how conflicting interests are managed.	3.7 a-d) An overview of Powerco's stakeholders is provided in Chapter 3.5.
3.8 A description of the accountabilities and responsibilities for asset management on at least three levels, including - a) governance – a description of the extent of director approval required for key asset management decisions and the extent to which asset management outcomes are regularly reported to directors; b) executive – an indication of how the in-house asset management and planning organisation is structured; c) field operations – an overview of how field operations are managed, including a description of the extent to which field work is undertaken in-house and the areas where outsourced contractors are used.	3.8 A description of the accountabilities and responsibilities for asset management is provided in Chapter 4. a) Refer to Chapter 4.4. b) Refer to Chapter 4.4. c) Chapter 4.4 discusses operational excellence, outsourced activities, and field operations.

Attachment A: Asset management plans	**AMP chapter where addressed**
3.9 All significant assumptions - a) quantified where possible; b) clearly identified in a manner that makes their significance understandable to interested persons, including: c) a description of changes proposed where the information is not based on the GDB's existing business; d) the sources of uncertainty and the potential effect of the uncertainty on the prospective information; e) the price inflator assumptions used to prepare the financial information disclosed in nominal New Zealand dollars in the Report on Forecast Capital Expenditure set out in Schedule 11a, and the Report on Forecast Operational Expenditure set out in Schedule 11b.	3.9 a) Refer to Appendix 1 and 7 Expenditure forecast assumptions. b) Appendix 1 provides key assumptions in the development of the AMP. Chapter 7 describes assumptions for each expenditure category forecast. c) Not applicable. d) Sources of uncertainty are discussed in Chapter 2 and Chapter 7. e) The price inflator assumptions are included in Chapter 7.

Attachment A: Asset Management Plans	**AMP chapter where addressed**
3.10 A description of the factors that may lead to a material difference between the prospective information disclosed and the corresponding actual information recorded in future disclosures.	3.10 This is discussed in Chapter 1 and throughout Chapter 7.
3.11 An overview of Asset Management Strategy and delivery. *To support the Report on Asset Management Maturity disclosure and assist interested persons to assess the maturity of Asset Management Strategy and delivery, the AMP should identify -* a) how the asset management strategy is consistent with the GDB's other strategy and policies; b) how the asset strategy takes into account the lifecycle of the assets; c) the link between the Asset Management Strategy and the AMP; d) processes that ensure costs, risks and system performance will be effectively controlled when the AMP is implemented.	3.11 a) Figure 4.5 in Chapter 4 demonstrates the line of sight from our corporate plans and objectives to our asset management strategies. b) This is discussed in Chapter 4.9. c) Chapter 4 describes the relationship. d) Chapter 4.4 describes the processes to ensure costs, risks and system performance are effectively controlled. Chapter 5 describes the lifecycle considerations of each asset class.

Attachment A: Asset Management Plans	**AMP chapter where addressed**
3.12 An overview of systems and information management data. *To support the AMMAT disclosure and assist interested persons to assess the maturity of systems and information management, the AMP should describe –* a) the processes used to identify asset management data requirements that cover the whole lifecycle of the assets; b) the systems used to manage asset data and where the data is used, including an overview of the systems to record asset conditions and operation capacity, and to monitor the performance of assets; c) the systems and controls to ensure the quality and accuracy of asset management information; d) the extent to which these systems, processes and controls are integrated.	3.12 Chapters 4.9, 4.10 and 7 provide information on asset management processes for systems and information management data (non-network assets). Chapter 4 describes our asset management performance measures, including our AMMAT score. a) Chapter 5 discusses processes to identify data requirements for each asset class. b) Our information management systems, including the systems used to manage asset data and record asset condition, are described in chapter 4.10. c) Refer to Chapters 4 and 7. d) Refer to Chapters 4 and 7.
3.13 A statement covering any limitations in the availability or completeness of asset management data and disclose any initiatives intended to improve the quality of this data. *Discussion of the limitations of asset management data is intended to enhance the transparency of the AMP and identify gaps in the asset management system.*	3.13 Limitations are described in Chapter 6 within the asset information section for each asset class. Initiatives are discussed in Chapter 4, as well as in Chapter 5 and Chapter 7.3.1.
3.14 A description of the processes used within the GDB for – a) managing routine asset inspections and network maintenance; b) planning and implementing network development projects; c) measuring network performance.	3.14 a) Refer to Chapter 5. b) Refer to Chapter 4.4 and 4.9. c) Refer to Chapter 4.

Attachment A: Asset Management Plans	AMP chapter where addressed
3.15 An overview of asset management documentation, controls and review processes. *To support the Report on Asset Management Maturity disclosure and assist interested persons to assess the maturity of asset management documentation, controls and review processes, the AMP should -* a) identify the documentation that describes the key components of the Asset Management System and the links between the key components; b) describe the processes developed around documentation, control and review of key components of the Asset Management System; c) where the GDB outsources components of the Asset Management System, the processes and controls that the GDB uses to ensure efficient and cost-effective delivery of its Asset Management Strategy; d) where the GDB outsources components of the Asset Management System, the systems it uses to retain core asset knowledge in-house; e) audit or review procedures undertaken in respect of the Asset Management System.	3.15 a) This is discussed in Chapter 4. b) This is discussed in Chapter 4. c) The discussion on outsourced activities can be found in Chapter 4.4. Additionally, in Chapter 4.12 we have included a dedicated performance measure focused on ensuring the cost-effective provision of gas. d) Chapter 4.10 outlines our Mobile Workforce Management System, a tool that greatly aids us in maintaining asset knowledge within our organisation. e) This is discussed in Chapter 4.4, 4.9 and 4.11.
3.16 An overview of communication and participation processes. *To support the Report on Asset Management Maturity disclosure and assist interested persons to assess the maturity of asset management documentation, controls and review processes, the AMP should -* a) communicate asset management strategies, objectives, policies and plans to stakeholders involved in the delivery of the asset management requirements, including contractors and consultants; b) demonstrate staff engagement in the efficient and cost-effective delivery of the asset management requirements.	3.16 a) This is discussed in Chapter 4. AMMAT assessment is discussed in Chapter 4.6. b) The asset management planning responsibilities outlined in Chapter 4 highlight the involvement of our staff in the efficient and cost-effective delivery of the asset management requirements.

Attachment A: Asset Management Plans	AMP chapter where addressed
3.17 The AMP must present all financial values in constant price in New Zealand dollars, except where specified otherwise.	3.17 All figures are constant June 2023 dollars.
3.18 The AMP must be structured and presented in a way that the GDB considers will support the purposes of AMP disclosure, set out in clause 2.6.2 of the determination.	3.18 In 2023, Powerco restructured the Gas AMP in alignment with its overarching vision, purpose and branding. A key objective was to make it easier for interested parties to follow and understand. Notably, this restructuring encompasses well-defined corporate-driven Asset Management Objectives, adopted by Powerco's gas and electricity businesses. We are also working towards aligning our gas Asset Management System with the principles of internationally recognised asset management standard ISO: 55001.
Contents of the AMP	
4. The AMP must provide details of the assets covered, including: 4.1 A map and high-level description of the areas covered by the GDB, including the region(s) covered; 4.2 If subnetworks exist, the network configuration information should be disclosed for each subnetwork - a) A map or maps, with any cross-referenced information contained in an accompanying schedule, showing the physical location of: (i) all main pipes, distinguished by operating pressure; (ii) all ICPs that have a significant impact on network operations or asset management priorities, and a description of that impact; (iii) all gate stations; (iv) all pressure regulation stations; b) If applicable, the locations where a significant change has occurred since the previous disclosure of the information referred to in subclause 4.2(a) above, including: (i) a description of the parts of the network that are affected by the change; (ii) a description of the nature of the change.	4. 4.1 A map and high-level description of our regions are shown in Chapter 3. 4.2 Appendix 5 discusses our subnetwork configurations: a) Network maps by region, displaying the physical location of all required network elements, are located in Appendix 6. b) Network changes are described in Chapter 6.

Attachment A: Asset Management Plans	AMP chapter where addressed
Network assets by category	
5. The AMP must describe the network assets by providing the following information for each asset category: 5.1 Pressure; 5.2 Description and quantity of assets; 5.3 Age profiles; 5.4 A discussion of the results of formal risk assessments of the assets, further broken down by subcategory as appropriate. Systemic issues leading to the premature replacement of assets or parts of assets should be discussed.	5. Chapter 5 provides an overview of assets, including information on condition, age profiles, quantities, and pressure. Additionally, it provides a lifecycle plan for each asset that discusses asset condition and risk assessments.
6. The asset categories discussed in clause 5 above should include at least the following: 6.1 The categories listed in the Report on Forecast Capital Expenditure in Schedule 11a(iii); 6.2 Assets owned by the GDB but installed at gate stations owned by others.	6. The overview of assets in Chapter 5 of the AMP includes the asset categories listed in the Report on Forecast Capital Expenditure in Schedule 11a(iii). Asset quantities detailed in this AMP pertain to Powerco's ownership. In cases where the compound or gas gate housing our assets is under the ownership of a third party, we account for our assets only.
Service levels	
7. The AMP must clearly identify or define a set of performance indicators for which annual performance targets have been defined. The annual performance targets must be consistent with business strategies and Asset Management Objectives and be provided for each year of the AMP planning period. The targets should reflect what is practically achievable given the current network configuration, condition and planned expenditure levels. The targets should be disclosed for each year of the AMP planning period.	7. Chapter 4 details our annual asset management performance measures and their alignment with the business strategies and Asset Management Objectives.

Attachment A: Asset Management Plans	AMP chapter where addressed
8. Performance indicators for which targets have been defined in clause 7 must include: 8.1 The DPP requirements required under the price quality path determination applying to the regulatory assessment period in which the next disclosure year falls; 8.2 Customer-oriented indicators that preferably differentiate between different customer types; 8.3 Indicators of asset performance, asset efficiency and effectiveness, and service efficiency, such as technical and financial performance indicators related to the efficiency of asset utilisation and operation; 8.4. The performance indicators disclosed in Schedule 10b of the determination.	8. Our asset management performance measures in Chapter 4.12 include the indicators required by clause 8.
9. The AMP must describe the basis on which the target level for each performance indicator was determined. Justification for target levels of service includes customer expectations or demands, legislative, regulatory, and other stakeholders' requirements or considerations. The AMP should demonstrate how stakeholder needs were ascertained and translated into service level targets.	9. This is discussed in Chapter 4.12.
10. Targets should be compared with historic values where available to provide context and scale to the reader.	10. Chapter 4.12 provides historical performance.
11. Where forecast expenditure is expected to materially affect performance against a target defined in clause 7 above, the target should be consistent with the expected change in the level of performance.	11. Not relevant.
Network development planning	
12. AMPs must provide a detailed description of network development plans, including:	12. Chapter 6 discusses network development planning and provides details on all network development plans.
12.1 Description of the planning criteria and assumptions for network development.	12.1 Planning criteria is a focus of Chapter 6 and is also discussed in Chapter 4.9. Planning assumptions are discussed in Chapter 7.

Attachment A: Asset Management Plans	AMP chapter where addressed
12.2 Planning criteria for network developments should be described logically and succinctly. Where probabilistic or scenario-based planning techniques are used, this should be indicated, and the methodology briefly described.	12.2 Planning criteria is a focus of Chapter 6 and is also discussed in Chapter 4.9.
12.3 The use of standardised designs may lead to improved cost efficiencies. This chapter should discuss - a) the categories of assets and designs that are standardised; b) the approach used to identify standard designs.	12.3 Network rationalisation is discussed in Chapter 6.8
12.4 A description of the criteria used to determine the capacity of equipment for different types of assets or different parts of the network. The criteria described should relate to the GDB's philosophy in managing planning risks.	12.4 This is discussed in Chapters 4, 4.11, 5.1 and 6.
12.5 A description of the process and criteria used to prioritise network development projects and how these processes and criteria align with the overall corporate goals and vision.	12.5 The processes and criteria used to prioritise network development projects are described in Chapter 4.9. Chapter 4 outlines how the overall asset management process aligns with our corporate objectives, vision and purpose statement. *Note individual projects under Network Plans are incorporated in the Gas Works Plan (GWP) projects lists in Chapter 5 for each asset class.*

Attachment A: Asset Management Plans	AMP chapter where addressed
12.6 Details of demand forecasts, the basis on which they are derived, and the specific network locations where constraints are expected, because of forecast increases in demand - a) explain the load forecasting methodology and indicate all the factors used in preparing the load estimates; b) provide separate forecasts to at least the system level, covering at least a minimum five-year forecast period. Discuss how uncertain but substantial individual projects/developments that affect load are taken into account in the forecasts, making clear the extent to which these uncertain increases in demand are reflected in the forecasts; c) identify any network or equipment constraints that may arise because of the anticipated growth in demand during the AMP planning period. The AMP should include a description of the methodology and assumptions used to produce the utilisation and capacity forecasts and a discussion of the limitations of the forecasts, methodology and assumptions. The AMP should also discuss any capacity limitations identified or resolved in years during which an AMP was not disclosed.	12.6 a) The methodology is provided in Chapters 6.1 and 6.2. b) In Chapter 6.2, we describe forecasted regional demand and its influence on projects. c) In Chapter 6, we highlight where potential constraints are expected to occur during the planning period.
12.7 Analysis of the significant network level development options identified, and details of the decisions made to satisfy and meet target levels of service, including - a) the reasons for choosing a selected option for projects where decisions have been made; b) the alternative options considered for projects that are planned to start in the next five years; c) consideration of planned innovations that improve efficiencies within the network, such as improved utilisation, extended asset lives, and deferred investment.	12.7 a) & b) Chapter 6.3 to 6.8 describes projects and rationale for decisions by region. Chapter 4 outlines our investment optimisation approach. c) Chapter 4 discusses new technology.

Attachment A: Asset Management Plans	AMP chapter where addressed
12.8. A description and identification of the network development programme and actions to be taken, including associated expenditure projections. The network development plan must include - a) a detailed description of the material projects and a summary description of the non-material projects currently under way or planned to start within the next 12 months; b) a summary description of the programmes and projects planned for the following four years (where known); c) an overview of the material projects being considered for the remainder of the AMP planning period. *For projects included in the AMP where decisions have been made, the reasons for choosing the selected option should be stated, which should include how target levels of service will be impacted. For other projects planned to start in the next five years, alternative options should be discussed.*	12.8 Chapter 6 describes the development programme by region with a focus over the five-year horizon and, where possible, 10 years. a) & b) Material projects are discussed in Chapter 6.3 to 6.8 (expenditure summary and project tables) for the 10-year period where known, and Schedule 12B. c) Network strategies provide direction for strategic investment and network performance requirements as described in Table 6.1. Levels of service related to these strategies are discussed in Chapter 4 (performance measures).
Lifecycle asset management planning (maintenance and renewal)	
13. The AMP must provide a detailed description of the lifecycle asset management processes, including: 13.1 The key drivers for maintenance planning and assumptions;	13. The drivers and key challenges are included in Chapters 5.1 to 5.5. Maintenance-related assumptions are outlined in Chapter 5.

Attachment A: Asset Management Plans	AMP chapter where addressed
13.2. Identification of routine and corrective maintenance and inspection policies and programmes, and actions to be taken for each asset category, including associated expenditure projections. This must include - a) the approach to inspecting and maintaining each category of assets, including a description of the types of inspections, tests and condition monitoring carried out and the intervals at which this is done; b) any systemic problems identified with any particular asset types and the proposed actions to address these problems; c) budgets for maintenance activities broken down by asset category for the AMP planning period.	13.2 Powerco's maintenance strategy is outlined in Chapters 5.1 to 5.6, and the forecasts are presented in Chapter 7. a) Chapter 5 outlines the inspection and maintenance strategy, detailing the associated tasks and their respective frequencies for every asset class. b) Refer to Chapter 6. c) Chapter 7 provides a breakdown of the budgets for routine and corrective maintenance and inspection, by asset class.
13.3. Identification of asset replacement and renewal policies and programmes and actions to be taken for each asset category, including associated expenditure projections. This must include - a) the processes used to decide when and whether an asset is replaced or refurbished, including a description of the factors on which decisions are based, and consideration of future demands on the network and the optimum use of existing network assets; b) a description of innovations made that have deferred asset replacement; c) a description of the projects currently under way or planned for the next 12 months; d) a summary of the projects planned for the following four years (where known); e) an overview of other work being considered for the remainder of the AMP planning period.	13.3 a) Powerco's renewal strategy is discussed in the asset lifecycle plans in Chapter 5. b) Innovations are discussed in Chapter 5 for each asset class. Chapter 4 discusses specific new technology improvements. c) Projects based on asset replacement and renewal are described in Chapter 5 (GWP24 project tables). d) Projects where future need has been identified are summarised in the Chapter 5 expenditure dashboards for each asset class (projects in the pipeline). e) For more detailed information about projects and the reasoning behind them, see Chapters 5 and 6.
13.4 The asset categories discussed in clauses 13.2 and 13.3 should include at least the categories in clause 6 above.	13.4 The asset lifecycle plans in Chapter 5 include this material.

Attachment A: Asset Management Plans	**AMP chapter where addressed**
Non-network development, maintenance and renewal	
14. AMPs must provide a summary description of material non-network development, maintenance and renewal plans, including:	
14.1. A description of non-network assets;	14.1 Chapter 4 describes non-network assets.
14.2. Development, maintenance and renewal policies that cover them;	14.2 Chapter 7 describes development, maintenance and renewal policies that cover non-network assets.
14.3. A description of material capital expenditure projects (where known) planned for the next five years;	14.3 Chapter 7 describes the reasons for the forecast trend in expenditure. Chapter 6 details proposed projects. *Note individual projects under Network Plans are incorporated in the Gas Works Plan (GWP) projects listed in Chapter 5 for each asset class.*
14.4. A description of material maintenance and renewal projects (where known) planned for the next five years.	14.4 Chapter 7 describes the reasons for the forecast trend in expenditure. Chapter 6 details proposed projects. *Note individual projects under Network Plans are incorporated in the Gas Works Plan (GWP) projects listed in Chapter 5 for each asset class.*
Risk management	
15. AMPs must provide details of risk policies, assessment, and mitigation, including:	Chapter 4.11 Risk Management and Assurance provides an overview of risk management, including details on Powerco's policies and processes for assessment and mitigation
15.1. Methods, details and conclusions of risk analysis;	Methods are discussed in Chapter 4.11. In Chapter 5 we talk about asset-specific risks, while Chapter 6 outlines network risks.
15.2. Strategies used to identify areas of the network that are vulnerable to high-impact low-probability events, and a description of the resilience of the network and asset management systems for such events.	These are discussed in: • Chapter 4.12 • Chapter 7 Forecast Expenditure; and • Appendix 4 General Network Risks Formal Safety Assessment
15.3. A description of the policies to mitigate or manage the risks of events identified in clause 15.2;	This is discussed in Chapter 4.11. Emergency management procedures are detailed in Chapter 4.11

Attachment A: Asset Management Plans	AMP chapter where addressed
15.4. Details of emergency response and contingency plans. *Asset risk management forms a component of an GDB's overall risk management plan or policy, focusing on the risks to assets and maintaining service levels. AMPs should demonstrate how the GDB identifies and assesses asset-related risks, and describe the main risks within the network. The focus should be on credible low-probability, high-impact risks. Risk evaluation may highlight the need for specific development projects or maintenance programmes. Where this is the case, the resulting projects or actions should be discussed, linking back to the development plan or maintenance programme.*	15.4 This is discussed in Chapter 4.12.
Evaluation of performance	
16. AMPs must provide details of performance measurement, evaluation, and improvement, including:	
16.1. A review of progress against plan, both physical and financial - a) referring to the most recent disclosures made under clause 2.5.1 of this determination, discussing any significant differences and highlighting reasons for substantial variances; b) commenting on the progress of development projects against that planned in the previous AMP and provide reasons for substantial variances along with any significant construction or other problems experienced; c) commenting on progress against maintenance initiatives and programmes and discussing the effectiveness of these programmes noted.	16.1 Appendix 7 provides an overview of our progress against physical and financial plans set out in the 2022 AMP.

Attachment A: Asset Management Plans	AMP chapter where addressed
16.2. An evaluation and comparison of actual service level performance against targeted performance - a) in particular, comparing the actual and target service level performance for all the targets discussed in the previous AMP under clause 7 and explain any significant variances;	16.2 Chapter 4 compares actual service level performance against targeted performance.
16.3. An evaluation and comparison of the results of the asset management maturity assessment disclosed in the Report on Asset Management Maturity set out in Schedule 13 against relevant objectives of the GDB's asset management and planning processes;	16.3 Refer to Chapter 4.
16.4. An analysis of gaps identified in clauses 16.2 and 16.3. Where significant gaps exist (not caused by one-off factors), the AMP must describe any planned initiatives to address the situation.	16.4 This is included in Chapter 4.
Capability to deliver	
17. AMPs must describe the processes used by the GDB to ensure that:	
17.1. The AMP is realistic, and the objectives set out in the plan can be achieved;	17.1 Chapter 1 describes how we have ensured our expenditure forecasts are realistic. Chapter 4.2 describes how Powerco ensures the AMP is realistic and objectives can be achieved.
17.2. The organisation structure and the processes for authorisation and business capabilities will support the implementation of the AMP plans.	17.2 Chapter 4.4 describes the processes and organisational structure Powerco uses for implementing the AMP.

Directors Certificate
Gas Asset Management Plan Information Disclosure

Certificate for Year-Beginning Disclosures

Pursuant to clause 2.9.1 of Section 2.9

We, John Loughlin and Philip Cory-Wright, being Directors of Powerco Limited certify that, having made all reasonable enquiry, to the best of our knowledge:

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

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

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

Director:

26 September 2023

Date:

Director:

26 September 2023

Date: