

Approaches to Infrastructure Pricing Study: Part 2 - Current Pricing Analysis

A report for the New Zealand Infrastructure Commission - Te Waihanga

January 2024



Context for this report

Context for this report

Te Waihangā - the New Zealand Infrastructure Commission (Te Waihangā) has commenced a programme of work to develop an economic framework for pricing infrastructure to provide a principled, sector-agnostic baseline for future policy analysis. The economic framework for pricing infrastructure is intended to be applied across the four key infrastructure sectors (the four sectors) - land transport, water, telecommunications (telco) and energy.

To support the development of the economic framework for pricing infrastructure, Te Waihangā commissioned the Approaches to Infrastructure Pricing Study (the Pricing Study), which comprises four components:

1. **Economic framework design.** Developing the economic framework for pricing infrastructure - focused on proposed Pricing Goals and Principles.
2. **Current pricing analysis.** Undertaking analysis of the current system settings of the four sectors, to build understanding of current pricing performance against the proposed Pricing Goals and Principles.
3. **Equity exploration.** Considering the equity implications of the proposed Pricing Goals and Principles.
4. **Information assessment.** Identifying the data sources available for information on infrastructure pricing and pricing practices in New Zealand.

Each component of the Pricing Study contributes to the development of the final economic framework for pricing infrastructure, and will be combined into a final report for Te Waihangā to provide a single reference point for the Pricing Study.

Purpose and scope of this report

The focus of this report is Part 2: Current Pricing Analysis, which is designed to build understanding of the current performance of pricing regimes in the four sectors, as well as to support Te Waihangā's continued development of the economic framework for pricing infrastructure. Specifically, the current pricing analysis is intended to:

- Build understanding of how the current system settings of the four sectors perform against the proposed Pricing Goals and Principles - to identify sector-specific strengths and challenges, as well as to identify key opportunities.
- Identify key lessons from the application of the proposed Pricing Goals and Principles to support the ongoing development of the economic framework for pricing infrastructure as well as its future application.

Reflecting the above, the current pricing analysis is designed to provide overarching sector-level analysis to enable cross-sector comparison - focused on overall pricing practices and broad trends rather than detailed subsector or entity-level performance. In this respect we note:

- Effective and high-quality pricing practices do not look the same across sectors, reflecting the differences within each. Therefore, in assessing pricing performance across the four sectors it is not possible to adopt a 'one size fits all' approach.
- This report is intended to be used to support Te Waihangā's ongoing stakeholder engagement, both within the four sectors as well as territorial local authorities, unitary councils and regional councils (collectively referred to in this report as local government), and central government policy-makers, to enable the continued development of the evidence base. This report has been written for an informed reader, recognising that the reader will not be an expert in all sectors explored.

Content for this report

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Executive Summary



Executive summary (1 of 6)

Overview

Te Waihangā - the New Zealand Infrastructure Commission (Te Waihangā) has commenced a programme of work to develop an economic framework for pricing infrastructure, focused on establishing a pricing system that better reflects need, provides options and spreads the burdens on New Zealand's infrastructure more evenly. The economic framework for pricing infrastructure is intended to be applied across the four key infrastructure sectors (the four sectors) - land transport, water, telco and energy.

There are four key pieces of work which together form the Pricing Study

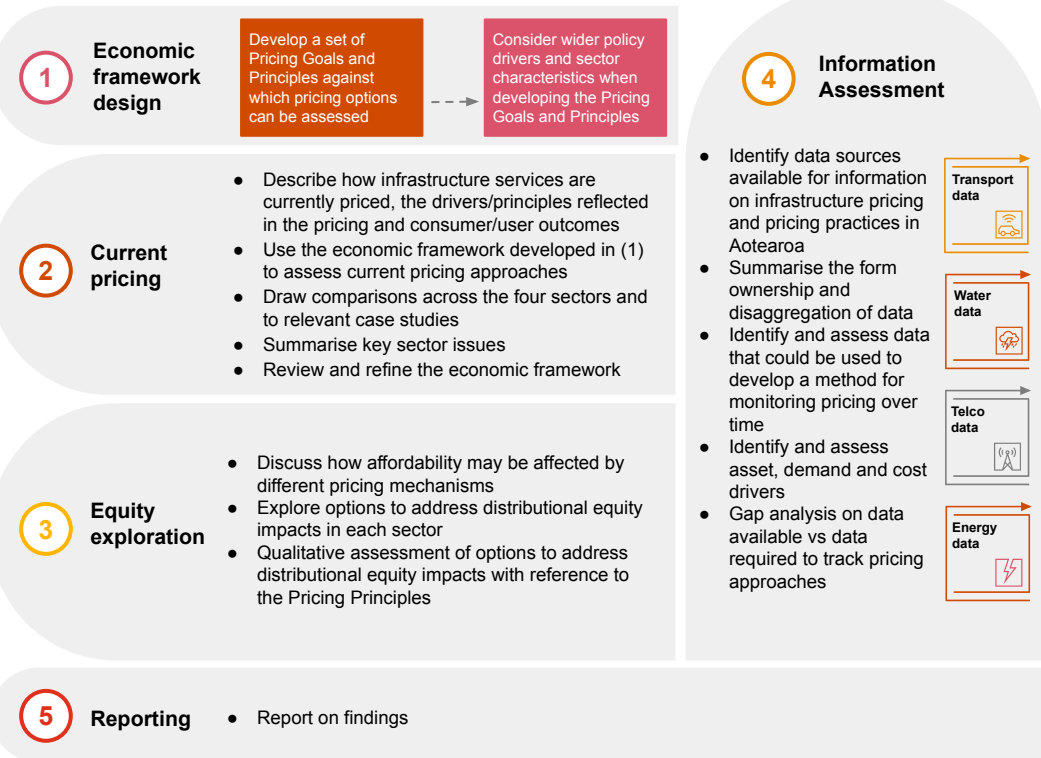
1. Economic framework design
2. Current pricing analysis
3. Equity exploration
4. Information assessment

Each part of this study contributes to the development of the final framework.



This report forms Part 2 - Current pricing analysis

Parts of the Pricing Study



Executive summary (2 of 6)

In this report, we use the proposed Pricing Principles and Goals to examine current pricing practices in Aotearoa. The analysis covers the current system settings of the four sectors - with a focus on the role of regulation and market structure. This reflects the critical role of the interface between markets and rules in achieving value for money in infrastructure provision.

The current pricing analysis in this report is designed to build understanding of the current performance of pricing regimes in the four sectors, as well as to support Te Waihanga's continued development of the economic framework for pricing infrastructure. Specifically, the current pricing analysis is intended to:

- Build understanding of how the current system settings of the four sectors perform against the proposed Pricing Goals and Principles - to identify sector-specific strengths and challenges, as well as to identify key opportunities across sectors.
- Identify key lessons from the application of the proposed Pricing Goals and Principles to support the ongoing development of the economic framework for pricing infrastructure as well as its future application.

Reflecting the above, the current pricing analysis is designed to provide overarching sector-level analysis to enable cross-sector comparison - focused on overall pricing practices and broad trends rather than detailed subsector or entity-level performance. While this approach places limitations on the level of detail provided for each sector, it was adopted to enable cross-sector comparative insights.

The current pricing analysis is based on version 2 of the proposed Pricing Goals and Principles. Insights from the current pricing analysis may inform further iterations to those goals and principles. **The version of the proposed Pricing Goals and Principles used for the current pricing analysis are defined to the right.**

Proposed Pricing Goals and Principles against which current pricing is assessed

Goal 1: Pricing mechanisms should guide investment decisions

1. **Quality of service:** Pricing should create incentives to improve the quality of service in ways that users want to pay for
2. **Network configuration options:** Pricing should reflect differences in whole of life costs between network configuration options
3. **Level of investment:** Pricing should incentivise a level of investment which balances the associated benefits and costs
4. **Risk allocation:** Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

5. **Usage behaviour:** Pricing should encourage efficient and appropriate use of the network
6. **Whole of life costs by type of use:** Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour
7. **Signalling externalities:** Prices should signal both positive and negative externalities generated by the network and its use
8. **Appropriate user-funded subsidies:** Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave
9. **Transparent and reasonable implementation:** Pricing should be developed and implemented in a transparent and reasonable manner

Goal 3: Pricing should incentivise broadly distributed benefits

10. **Benefits of efficiency gains:** Pricing should provide incentives for suppliers to lower prices as they become more efficient
11. **Price-quality trade-offs:** Prices should allow users to make price-quality trade-offs
12. **Appropriate publicly-funded subsidies:** Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network or investment in it, and where these benefits would exist even when pricing already aligns with principles 1-11.

Executive summary (3 of 6)

The approach and methodology developed for the current pricing analysis enables a consistent approach to be adopted across the four sectors.

The current pricing analysis aims to evaluate the current system settings of the four sectors against the proposed Pricing Goals and Principles. Reflecting this, the analysis for each of the four sectors is structured as follows:

- **Sector scorecard.** Each sector's performance is scored at goal-level using a scorecard, with the proposed Pricing Principles that sit under each goal adopted as the criteria. The scorecard breaks performance into the two key categories:
 - **RAG Rating.** This is a broad view of a sector's current performance, providing a red, amber green rating for each goal.
 - **Sector direction.** This indicates the potential direction of change for the sector's future pricing performance.
- **Detailed analysis.** Summaries of the more detailed analysis at the proposed Pricing Principle-level for each sector support the key findings shown in the sector scorecards.

We also identify cross-sector findings and opportunities, as well as the key themes and areas critical for improving pricing performance. Alongside this, we derive lessons from the application of the proposed Pricing Goals and Principles about the principles themselves. These inform the continued development of the proposed economic framework for pricing infrastructure and its future application.

























The cross-sector summary scorecard and associated key findings on the next three pages provide a view of performance against the proposed Pricing Goals of all four sectors for comparison.

The current pricing analysis highlights the significant variability in pricing performance and levels of pricing maturity across the four sectors, with sectors performing more strongly where the current system settings were designed to promote competition and incentivise efficient investment in services.

The key cross-sector findings identified through the current pricing analysis include:

- **Those sectors responsible for funding services predominantly through direct user charges (telco and energy) perform far better against the Pricing Goals and Principles.**
- **System settings are critical to enabling achievement of the pricing goals and principles.** Market structure, policy settings, legislation, and regulation can support or prevent good pricing practice.
- **As operational practice matures, price signals can become more targeted and performance against the principles improves.** For example, many options for price quality trade-offs depend on a level of operational maturity, including transparency, access to data and information, and systems and processes for billing and monitoring.
- **Under-recovery of costs may compromise service quality and lead to cascading failures over time,** despite user willingness to pay for better service and resilience.
- **Recovering the costs of long-lived infrastructure requires a consistent long-term approach** that recognises the risk of changes in demand and technology.
- **Once cost-reflective pricing is implemented, adjustments can reflect either unpriced costs and benefits or reallocate costs among users to achieve other outcomes.** Without it, adjustments risk creating harmful distortions.

Executive summary (4 of 6)

Goal	Land transport		Water		Telco		Energy	
	RAG rating	Sector direction	RAG rating	Sector direction	RAG rating	Sector direction	RAG rating	Sector direction
Goal 1 Pricing mechanisms should guide investment decisions								
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions								
Goal 3 Pricing should incentivise broadly distributed benefits								

Scorecard key:

RAG rating	<ul style="list-style-type: none"> GREEN. Sector currently performs well against a majority of proposed Pricing Principles. AMBER. Sector has a mixed performance against proposed Pricing Principles - performing well against some Pricing Principles and underperforming against others. RED. Sector underperforms against a majority of proposed Pricing Principles. 	Sector direction	<ul style="list-style-type: none"> UPWARD ARROW. The current system settings indicate there is scope or opportunity to improve pricing performance (e.g. through sector reform), and therefore performance is expected to improve. CIRCLE. The current systems are embedded, with limited scope or opportunity to make changes to improve pricing performance and therefore performance is expected to stay static. DOWNWARD ARROW. The current system settings indicate risk of worsening pricing performance.

Executive summary (5 of 6)

The current pricing analysis - through the identification of key areas of strength and challenges - enabled identification of key opportunities to improve pricing performance and outcomes across the four sectors. These are set out in the table below.

Land transport	Water	Telco	Energy
<ul style="list-style-type: none">• Reduction in non-priced use. Many users do not pay directly for the transport services they use (eg, free on-street parking, electric vehicle' exemption from road user charges), which harms cost-recovery and incentivises inefficient use. System settings prevent sector-wide implementation of cost-recovery from users.• Building evidence base to inform decision-making. There is a substantial misalignment of investment risk and benefits, and the incentives for investment are driven by policy rather than pricing.• More explicit pricing of externalities, such as through congestion pricing, would enhance options assessment and network efficiency, as well as improved pricing to signal the willingness to pay for changes in service levels and transport mode options.• Improving price signals. Existing pricing mechanisms and exceptions lack signalling power for investment and could be improved.	<ul style="list-style-type: none">• Future funding of water services. Current reforms seek to improve the future funding and financing of water services, including through more widespread use-based charges.• Building evidence base to inform decision-making. Pricing practices generally do not reflect investment choices and service quality options. Alongside this, a better understanding of existing cross subsidies between groups of water service users and other stakeholders will help to guide pricing reform.• Investing in metering. The transition away from fixed charges to volumetric charging has begun to improve price signals to users but more investment in metering is required.• Tailoring stormwater funding solutions. Stormwater services are interconnected with other infrastructure and require tailored funding solutions.	<ul style="list-style-type: none">• Improving equity. Pricing could evolve to improve services for user groups experiencing digital poverty (due to unaffordability of access and poor connectivity options in remote areas), which would likely improve net public benefits.• Evolving network pricing. Network pricing could evolve to better match costs, benefits and service levels. Fibre network suppliers have an opportunity to develop greater capability in monitoring what the market can bear alongside the risk of stranded assets as technology evolves.• Retail pricing sophistication. Retail pricing approaches miss an opportunity to apply more sophisticated pricing for congestion at peak times. This mutes signals both for users on the costs of usage patterns, and for suppliers on user willingness to pay for greater capacity at peak.• Managing risks. While public funding supported the investment in fibre ahead of demand, technology risk remains. Regulation of prices will need to adapt accordingly, including potentially removing regulatory constraints if user uptake of fibre starts to decline due to other technologies.	<ul style="list-style-type: none">• Incentivising efficiency. Pricing practices in electricity are still evolving, however there is strong guidance and monitoring from the regulator which is supporting the sector to move towards improving price signals to incentivise efficient use and investment outcomes.• Communicating increased complexity. The energy system is becoming more complex and pricing will need to adapt as energy markets evolve.• The energy transition may require network investment ahead of demand to facilitate decarbonisation. Pricing approaches will need to consider investment risk and affordability for users during the transition period.

Executive summary (6 of 6)

A set of key themes for driving pricing performance has emerged from the cross-sector analysis of current infrastructure pricing regimes.

System settings

Competition or regulation to promote outcomes consistent with the outcomes of competitive markets provide effective signals to both suppliers and users.

Missing signals for network configuration decisions create long-term distortions and path dependency.

Prices set by policy dampen key signals and are vulnerable to capture for purposes other than the efficient provision of infrastructure.

Implementation

Usage data is critical to inform the decisions of suppliers and decision-makers

Pricing signals need to be understandable and reach the user to be effective.

Adjustments

Positive externalities lead to underinvestment, negative externalities to overinvestment.

Central government funding can support outcomes where strong external benefits are provided by the network.

Understanding user willingness to pay is key to supporting more equitable outcomes.

The current pricing analysis provided lessons in applying the proposed Pricing Goals and Principles to support Te Waihangā's continued development of the economic framework for pricing infrastructure and its application.

Four key lessons were identified:

1. The proposed Pricing Goals and Principles are applicable, and enable analysis, across the four sectors.
2. Communication of the proposed Pricing Goals and Principles needs to reflect the wide range of stakeholders across the four sectors.
3. Infrastructure pricing has several important roles. Infrastructure pricing sends signals to suppliers about where they should invest in increased capacity or improved services. It also sends signals to users about when, where, and how they should use networks. There is a risk that using pricing to effect broader central or local government objectives can undermine these signals.
4. There is a hierarchy of infrastructure Pricing Goals and Principles. Goal 1 is the most important to get right first, because it guides sector-wide investment and network configuration choices that have long-lived, path-dependent impacts on infrastructure. Goal 2 is the next most important, as it sends signals to users about when, where, and how they should use networks to maximise overall social benefits. Goal 3, which relates to adjustments to improve affordability and accessibility for subgroups of users, should be pursued after the basics of pricing are achieved, rather than as an alternative.

The current pricing analysis and associated key findings described above informed Parts 3-4 of the Pricing Study, including further iterations to the proposed Pricing Goals and Principles to support this work, as described in Appendix C. Taken together, this work will support Te Waihangā's ongoing development of the economic framework for pricing infrastructure and associated stakeholder engagement.

1

Introduction and
approach to current
pricing analysis

Introduction and approach to current pricing analysis - section overview

Focus of this section

This section explains the approach to the current pricing analysis, and includes:

- **The proposed Pricing Goals and Principles.** These provide the foundation for the current pricing analysis in this report.
- **The purpose and scope of the current pricing analysis.** This includes how the analysis fits within the wider programme of work to support the development of Te Waihangā economic framework for pricing infrastructure.
- **The approach to the current pricing analysis.** This includes a description of key supporting activities, including engagement with Te Waihangā, and qualitative and quantitative analysis.
- **The scoring methodology.** This explains the use of a scorecard, and the detailed analysis that supported the scoring.



Background to the current pricing analysis

Rautaki Hanganga o Aotearoa - the New Zealand Infrastructure Strategy 2022-2052 (the Strategy) describes the actions required over the next 30 years to ensure New Zealand's infrastructure is well-positioned to meet the challenges and opportunities that lie ahead. Within the Strategy, providing better infrastructure through pricing - to better reflect need and provide for options and spread the load on our infrastructure more evenly - was identified as an area that could have the greatest impact over the next 30 years on transforming New Zealand.

Since the release of the Strategy, Te Waihangā has commenced a programme of work to develop an economic framework for pricing infrastructure, intended to be applied across the four key infrastructure sectors (the four sectors) - land transport, water, telco and energy. To support the development of the economic framework for pricing infrastructure, Te Waihangā commissioned the Pricing Study, which comprised four components of work:

1. Economic framework. Developing the economic framework for pricing infrastructure - focused on proposed Pricing Goals and Principles.
2. Current pricing analysis. Undertaking analysis of the current system settings of the four sectors, to build understanding of current pricing performance against the proposed Pricing Goals and Principles.
3. Equity exploration. Considering the equity implications of the proposed Pricing Goals and Principles.
4. Information assessment. Identifying the data sources available for information on infrastructure pricing and pricing practices in New Zealand.

This report is focused on Part 2: Current pricing analysis of the Pricing Study.

Proposed Pricing Goals and Principles for current pricing analysis

Background on proposed Pricing Goals and Principles

The approach to the current pricing analysis is grounded economic framework for pricing infrastructure developed through Part 1: Economic Framework Design of the Pricing Study - the development of this was informed by:

- An initial draft of pricing principles drawing on the established principles for energy distribution pricing, adapted and expanded for cross-sector application.
- Engagement with sector stakeholders, including workshops with subject matter experts to consider the engineering, technical, economic, regulatory and policy drivers behind pricing as well as testing of proposed Pricing Goals and Principles with Te Waihanga and sector stakeholders.

The economic framework for pricing infrastructure developed in Part 1 comprises:

- **Three proposed Pricing Goals.** These enable the categorisation of the 12 proposed Pricing Principles into three groups - to support ease of communication and a cross-sector understanding of the economic framework for pricing infrastructure.
- **12 proposed Pricing Principles.** These distill the critical economic concepts needed to address each of the three Pricing Goals within the context of natural monopoly industries whose outputs are foundational to a prosperous society.

The proposed Pricing Goals and Principles used as a basis for the current pricing analysis are defined to the right. Note the version of the proposed Pricing Goals and Principles adopted for this analysis is not considered final. Rather, the results of the current pricing analysis are intended to inform further iteration. **Appendix B** provides a more detailed technical description of the proposed Pricing Goals and Principles that were adopted for the current pricing analysis.

Proposed Pricing Goals and Principles used to assess current pricing

Goal 1: Pricing mechanisms should guide investment decisions

1. **Quality of service:** Pricing should create incentives to improve the quality of service in ways that users want to pay for
2. **Network configuration options:** Pricing should reflect differences in whole of life costs between network configuration options
3. **Level of investment:** Pricing should incentivise a level of investment which balances the associated benefits and costs
4. **Risk allocation:** Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

5. **Usage behaviour:** Pricing should encourage efficient and appropriate use of the network
6. **Whole of life costs by type of use:** Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour
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8. **Appropriate user-funded subsidies:** Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave
9. **Transparent and reasonable implementation:** Pricing should be developed and implemented in a transparent and reasonable manner

Goal 3: Pricing should incentivise broadly distributed benefits

10. **Benefits of efficiency gains:** Pricing should provide incentives for suppliers to lower prices as they become more efficient
11. **Price-quality trade-offs:** Prices should allow users to make price-quality trade-offs
12. **Appropriate publicly-funded subsidies:** Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network or investment in it, and where these benefits would exist even when pricing already aligns with principles 1-11.

Purpose and scope of current pricing analysis

Purpose

The current pricing analysis is designed to build understanding of the current pricing performance of the four sectors, as well as to support Te Waihanga's ongoing development of the economic framework for pricing infrastructure.

Specifically, the current pricing analysis is intended to:

- Build understanding of how the current system settings of the four sectors perform against the proposed Pricing Goals and Principles - to identify sector-specific strengths and challenges, as well as to identify key opportunities across sectors.
- Identify key lessons from the application of the proposed Pricing Goals and Principles to support the ongoing development of the economic framework for pricing infrastructure as well as its future application.

Reflecting the above, the current pricing analysis is designed to provide overarching sector-level analysis to enable cross-sector comparison - focused on overall pricing practices and broad trends rather than detailed subsector or entity-level performance. While this approach introduces some limitations on the level of detail provided for each sector, it has been adopted to enable cross-sector comparative insights.

The current pricing analysis is a key component of work commissioned by Te Waihanga to support the development of the economic framework for pricing infrastructure. It has been based on the set of proposed Pricing Goals and Principles developed in Part 1 of the Pricing Study and will be used to inform further development and iteration of these.

Scope

Reflecting the purpose of the current pricing analysis, the scope includes analysis of the current system settings of the four sectors against the proposed Pricing Goals and Principles. The sector-specific components analysed vary due to the structure of each sector - **and the sector components within scope of the current pricing analysis are set out in the table below.**

Sector components included in current pricing analysis			
Land transport*	Water	Telco	Energy
<ul style="list-style-type: none">• Road network• Rail network• Public transport network	<ul style="list-style-type: none">• Water supply• Wastewater• Stormwater• Septic tanks**	<ul style="list-style-type: none">• Fixed lines• Mobile network• Satellite• Retail interfaces	<ul style="list-style-type: none">• Electricity - transmission and distribution• Gas - transmission and distribution• Wholesale and retail pricing signals• Off-grid generation**

**The current pricing analysis is focused on land transport, and therefore does not include analysis of aviation or maritime components of the transport sector. Ferry services are not explicitly addressed other than in our discussion of public transport services generally.*

*** We do not consider off-grid infrastructure in depth, but we consider the role it can play as a competitor to network infrastructure and the impact on willingness to pay signals for suppliers.*

The following are out of scope for the current pricing analysis:

- An assessment of overall performance of the four sectors.
- Recommendations on specific policy or regulatory actions for the sectors.

Approach to current pricing analysis

Approach

The approach to the current pricing analysis includes the following key steps:

- **Step 1: Development of methodology for current pricing analysis.** The methodology developed is grounded in the proposed Pricing Goals and Principles, with a scorecard approach was adopted to simplify analysis and support consistency across sectors. This is explained in more detail on the next page.
- **Step 2: Detailed analysis and scoring of the current system settings of the four sectors against the proposed Pricing Goals and Principles.** This comprised:
 - **Current systems settings.** An understanding of the current system settings for each of the four sectors was developed to enable detailed analysis.
 - **Detailed analysis.** Detailed analysis of each the four sectors against the proposed Pricing Goals and Principles was undertaken, summarised in a scorecard for each. This was undertaken at overarching sector-level, with scoring reflecting a 'point in time' view of overall pricing practices and broad trends.
 - **Cross-sector findings.** Identification of cross-sector themes from the detailed analysis. This included consideration of physical and institutional differences, key strengths and challenges, as well as opportunities for improvement.
- **Step 3: Key themes and lessons for the continued development of the economic framework for pricing infrastructure.** Articulation of insights into the relevance and weaknesses of the Principles themselves, gained by applying the proposed framework sector-by-sector.

Key activities that supported analysis

The approach to the current pricing analysis was supported by a range of activities, including:

- **Quantitative analysis.** We used case studies to quantify the some of the pricing practices undertaken in Aotearoa in order to illustrate how current pricing structures may or may not meet the Pricing Principles
- **Qualitative analysis.** We considered current pricing practices with reference to the system settings in each sector and how these may or may not support meeting the proposed Pricing Principles and Pricing Goals.
- **Engagement with Te Waihangā.** We worked with Te Waihangā throughout this analysis, with particular consideration to how findings are presented. This included development of the pricing scorecard.




Reflecting the above, the approach to the current pricing analysis was largely desktop based - and we have presented the foundational settings and frameworks that define pricing structures in each sector rather than identifying all of the pricing structures or methodologies that are applied. The case studies provide the opportunity to look into the prices and pricing approaches themselves, and are considered to be representative of some of the key issues relevant to the Pricing Principles.

Scoring of current pricing performance - scorecard overview

Sector scoring guide - scorecard overview







Each sector's performance is scored at proposed Pricing Goal-level using a scorecard, with the proposed Pricing Principles that sit under each goal adopted as the criteria. The scorecard for comparison of the pricing performance of each sector is shown to the right.

The key features of the scorecard include:

- **RAG rating.** This rates the sector's performance under each goal:
 - **RED:** Sector underperforms against a majority of proposed Pricing Principles.
 - **AMBER:** Sector has a mixed performance against proposed Pricing Principles - performing well against some Pricing Principles and underperforming against others.
 - **GREEN:** Sector currently performs well against a majority of proposed Pricing Principles.
- **Sector direction.** This indicates the expected direction of change for the sector's future pricing performance.
 -  **UPWARD ARROW.** The current system settings indicate there is scope or opportunity to improve pricing performance (e.g. through sector reform), and therefore performance is expected to improve.
 -  **CIRCLE.** The current systems are embedded, with limited scope or opportunity to make changes to improve pricing performance and therefore performance is expected to stay static.
 -  **DOWNWARD ARROW.** The current system settings indicate risk of worsening pricing performance.

Sector scorecard example template

Current pricing analysis scorecard - SECTOR

Pricing goal	RAG rating	Sector direction	Rationale
Goal 1			Summary of rationale for RAG rating and sector direction
Goal 2			Summary of rationale for RAG rating and sector direction
Goal 3			Summary of rationale for RAG rating and sector direction

The high-level scorecard summaries are supported by detailed analysis of each of the four sectors against the proposed Pricing Principles, which are outlined in Section 2.

2

Current pricing
analysis

Current pricing analysis - section overview

Focus of this section

In line with the approach to the current pricing analysis described in Section 1 of this report, the analysis of each of the four sectors in this section is comprised of:

- **Sector-specific overview of current system settings.** This describes the current system settings, including structural and legislative settings as they relate to pricing. This overview is intended to provide the foundation for the sector scorecard and detailed current pricing analysis
- **Sector scorecard and detailed current pricing analysis.** This section summarises the evaluations of sector performance at goal-level using a simplified scorecard to support understanding of overall performance. The analysis informing the scorecard is then provided in more detail. The proposed Pricing Principles that sit under each goal are adopted as the criteria to support this analysis.
- **Cross-sector findings.** The above current pricing analysis of the four sectors supported the identification of cross-sector findings, including strengths and challenges, as well as opportunities for improvement.

Scope of current pricing analysis

At a high-level the scope of the current pricing analysis for each of the four sectors is as follows:

- **Land transport.** This analysis is focused on road, rail, and public transport networks.
- **Water.** This analysis is focused on water supply, wastewater and stormwater.
- **Telco.** This analysis is focused on fixed lines, mobile networks, satellite, and the retail interface for these.
- **Energy.** This analysis is focused on the transmission and distribution of electricity and gas, with additional consideration of pricing signals from the wholesale and retail markets.

This scope is described in further detail within the current pricing analysis.

A photograph of a bus stop scene. In the foreground, a row of orange and white striped bollards is on the left. A group of people is waiting at the bus stop, which has a glass shelter with yellow 'B' signs. A yellow bus is stopped at the curb, with its destination sign reading 'Johns Creek West 1'. A digital display above the bus shows route information. The background shows a modern building with large windows.

2a. Land transport

Current system settings - scope

Land transport sector - overview

The land transport sector in New Zealand is made up of the road, rail and public transport networks - as described on the right. It is largely publicly owned and operated, with responsibility for governance, planning, operations and maintenance sitting across a wide range of central and local government agencies. As a result, network-provision is planned by the agencies responsible, based on estimates of future demand as well as central and local government priorities.

While the structure of funding in the land transport sector is built around the concept of a cost-recovery user-pays model, funding in practice is highly fragmented across a range of sources - reflecting the significant cost of operating and maintaining the network - including:

- **Pricing mechanisms** - prices are generally set on a cost-recovery basis from a combination of users, ratepayers and developers.
- **Crown investment** - the land transport sector is supported by a significant amount of Crown investment - in particular for:
 - central government priority projects (eg, the City Rail Link in Auckland)
 - crisis response (eg, the 2016 Kaikoura earthquake)
 - top-up funding to support the running of the network where costs are not fully recovered from users (eg, in the case of the rail network).

To provide the foundation for understanding the current pricing analysis, further detail follows on the current system settings for the land transport sector. This is an overview of sector structure and legislative framework, funding sources, approach to price setting, pricing structures and key trends.

Land transport sector - scope

The focus of the current pricing analysis for the land transport sector is on the road, rail and public transport networks:

- **Road network.** The road network in New Zealand is made up of 11,000 kilometres of state highways, and 83,000 kilometres of local roads. Waka Kotahi NZ Transport Agency is responsible for the state highway network, with local roads the responsibility of local government. The road network is funded through a mixture of charges (eg, fuel excise duty, rates) and public investment.
- **Rail network.** The rail network in New Zealand is made up of over 4,000 km of track. KiwiRail owns the rail network, and provides rolling stock freight and interregional services. As with the road network, the rail network is funded through a mixture of pricing (eg, fuel excise duty, track user and access charges) and public investment (eg, equity injections to KiwiRail or additional funding for large projects).
- **Public transport network.** The land based public transport network in New Zealand is comprised of:
 - **Passenger rail in Auckland and Wellington.** Auckland Transport and Greater Wellington Regional Council own the metro passenger rolling stock (i.e. trains) and stations in Auckland and Wellington respectively, with KiwiRail owning the tracks. Interregional passenger rail is not considered to be public transport.
 - **Local bus networks.** The operation of local bus networks is the responsibility of local government.
- The provision of public transport services is funded through a mixture of pricing (eg, passenger fares, fuel excise duty, rates) and public investment (eg, additional funding for large projects).

Current system settings - sector structure and legislative framework (1 of 2)

Below is a high-level overview of the structure and legislative framework that governs and sets the parameters for the land transport sector. The following pages **provide a more detailed view of how this translates into funding sources, and describe the approach to price setting in the land transport sector.**

Road network

Key organisations

- **Waka Kotahi New Zealand Transport Agency**, responsible for promoting an affordable, integrated, safe, responsive and sustainable land transport system. Waka Kotahi does this through investing in land transport activities, managing the state highway network, and providing access to, and regulation for, land transport.
- **Local government**, responsible for the management and maintenance of local roads.
- **Ministry of Transport**, responsible for providing advice to Ministers on policy settings and performance of land transport - including through setting the Government Policy Statement for Land Transport, and setting fuel excise duty and road user charges.

Legislative framework

- **Land Transport Management Act 2003**. Established Waka Kotahi New Zealand Transport Agency, and explains the requirements and processes for local authorities to obtain funding for roading construction and maintenance.
- **Land Transport Act 1998**. Defines the rules and regulations relating to the use of the road network.
- **Government Roding Powers Act 1989**. Provides the necessary powers for Waka Kotahi and ministers to build, maintain and manage roads.
- **Crown Entities Act 2004**. Provides the framework for governance of Crown entities such as Waka Kotahi.

Rail network

Key organisations

- **KiwiRail**, owns and maintains the national rail network in New Zealand - which is now funded through the National Land Transport Fund, supported by Crown investment and track user and access charges.
- **Ministry of Transport**, responsible for providing advice to ministers on policy settings and performance of land transport - including through setting the Government Policy Statement for Land Transport.
- **Waka Kotahi NZ Transport Agency**, primary regulatory responsibility for rail safety in New Zealand, providing independent assurance to stakeholders and the public of the effective management of rail safety risks by rail participants.

Legislative framework

- **The Railways Act 2005**. Provides for the regulation of rail operations in New Zealand. It covers monorails and both light and heavy railways, providing the powers for the railway operators to protect and manage the railway corridor.
- **The Land Transport (Rail) Legislation Act 2020**. Amended the Land Transport Management Act 2003 and the Land Transport Act 1998 to implement a new long-term planning and funding system for the heavy rail track network owned by KiwiRail.
- **State Owned Enterprises Act 1986**. Defines principles for governance of state-owned enterprises such as KiwiRail.

Current system settings - sector structure and legislative framework (2 of 2)

Public transport network

Key organisations

- **Regional councils and unitary councils**, responsible for the operation of local rail and bus networks.
- **Territorial authorities and unitary councils**, provide on-street bus infrastructure (eg, bus stops, bus lanes).
- **KiwiRail**, responsible for management of the tracks to support metro passenger rail.
- **Waka Kotahi NZ Transport Agency**, responsible for supporting public transport through its planning, investment and funding roles (does not directly provide public transport)
- **Ministry of Transport**, responsible for providing advice to ministers on policy settings and performance of land transport - including through setting the Government Policy Statement for Land Transport, as well as setting the Sustainable Public Transport Framework (replacing the previous Public Transport Operating Model).

Legislative framework

- **Land Transport Management Act 2003**. Explains the regulations for the provision of public transport services by public transport authorities (typically regional councils or unitary authorities), and exempt services (eg, commercial public transport services).



Current system settings - land transport funding sources

Below is a high-level overview of the national and regional/local funding arrangements for land transport. Waka Kotahi funds its state highway activities primarily from the National Land Transport Fund (NLTF). The rail network is also funded, in part, by the NLTF. Regional/local land transport activities are typically funded jointly by Waka Kotahi and local government agencies. Waka Kotahi uses the NLTF for this co-funding, with most investments attracting a NLTF funding assistance rate of 51% (ie, the local funding share is 49%). Overall, about three quarters of land transport investment from 2021-2024 was funded by user pricing (including local rates and charges, motor vehicle registration fees, road user charges and fuel excise duties).

National overview of planning and investment in land transport

National Land Transport Programme (NLTP)

The NLTP is a three-year programme that explains how Waka Kotahi, working with its partners (including KiwiRail and local government), plans to invest in the land transport network - across road, rail and public transport networks.

National Land Transport Fund (NLTF)

The NLTF provides ring-fenced funding to support delivery of the NLTP, and is administered by Waka Kotahi. The NLTF is made up of national revenue from pricing mechanisms within land transport, and can be topped up by additional Crown funding as shown below (based on 2021-24 NLTP).

Pricing mechanism

- Road User Charges
- Fuel Excise Duty
- Vehicle registration and licensing fees
- Rail Track User Charges

The pricing mechanisms above are described in more detail on the following pages.

Crown funding sources

- Rail Network Investment Programme
- Crown Infrastructure Package
- Provincial Growth Fund
- New Zealand Upgrade Programme
- Housing Infrastructure Fund Loan

Regional/local overview of planning and investment in land transport

Regional Land Transport Plan (RLTP)

A RLTP is a 10-year plan for a region's transport network. This includes transport infrastructure and services to be co-funded by Waka Kotahi (using the NLTF) and those projects that will be 100% locally funded.

Local funding

Local government provide funding to support delivery of the RLTP through council budget processes. This funding comes from pricing mechanisms within local government control. Most investment is co-funded by Waka Kotahi (for approved projects), when the local share of funding is committed

Pricing mechanism

- Property rates
- Targeted rates
- Development contributions
- Public transport fares

The pricing mechanisms above are described in more detail on the next page.

Crown funding sources

- Direct Crown investment supports local government projects (eg, City Rail Link in Auckland)
- Typically this is administered through the NLTF

Current system settings - approach to price setting in land transport (national)

	Land transport pricing mechanisms - national				
	Fuel Excise Duty <i>A charge for consumers of petrol* for use of the road</i>	Road User Charges <i>A charge for heavy vehicles and diesel vehicles for use of the road</i>	Vehicle registration and licensing fees <i>An annual charge for motor vehicle ownership</i>	Rail track user and access charges <i>User charges - rail freight operators</i> <i>Access charges - passenger rail services</i>	Toll charges <i>A charge for use of a specific road</i>
Who sets prices	Central government Central government is responsible for setting fuel excise duty, informed by advice from the Ministry of Transport.	Central government Central government is responsible for setting road user charges, informed by advice from the Ministry of Transport.	Waka Kotahi NZ Transport Agency Waka Kotahi NZ Transport Agency sets the annual charge for motor vehicle licensing, in addition to the initial vehicle registration fee.	Central government and KiwiRail Central government is responsible for setting track user charges, informed by advice from the Ministry of Transport and KiwiRail. Track access charges are set by KiwiRail.	Waka Kotahi NZ Transport Agency Waka Kotahi NZ Transport Agency sets the toll to use certain roads, with the charge varying by vehicle type.
Who pays	Motor vehicle users Fuel excise duty is a charge on fuel (ie, per litre) paid by motor vehicle users at source (ie, the petrol pump). Diesel does not incur fuel excise duty, as diesel vehicles pay road user charges instead.	Diesel vehicles and heavy vehicle owners These vehicle owners pay a distance based charge for using the road. The charge increases with vehicle axle weight.	Motor vehicle owners Motor vehicle owners pay the initial registration fee (one-off) and then an annual licensing fee to Waka Kotahi NZ Transport Agency.	Rail freight operators pay the track user charges into the National Land Transport Fund (via KiwiRail). Passenger rail service providers pay the track access charges to KiwiRail.	Toll road users / vehicle owners Vehicle owners pay the toll to use the road/section of road. They pay at the time of use (within 5 days). The toll varies by vehicle type (eg, heavy vehicles pay more).
How prices are set	Fuel excise duty is informed by a cost allocation model, and approved by Cabinet. Recently, wider policy objectives have also informed the approach to fuel excise duty, in response to general cost of living affordability concerns.	Road user charges is informed by a cost allocation model, and approved by Cabinet. Recently, wider policy objectives have also informed the approach to road user charges, in response to general cost of living affordability concerns.	Registration and licensing fees are largely set administratively to cover the costs of the regulatory regime relating to vehicles, plus administration fees for the system.	Track user charges are set to recover a contribution to the NLTF from national network users. Track access charges are set to recover maintenance costs in the metro areas (Auckland and Wellington).	Tolls are set to repay the debt (and interest) used to finance the road, along with covering the operating cost for the toll system. Prices usually consider motorists' willingness to pay, helping to ensure a certain level of revenue.

*Fuel excise duty is also charged on compressed natural gas (CNG) and liquified petroleum gas (LPG).

Current system settings - approach to price setting in land transport (regional/local)

Land transport pricing mechanisms - (regional/local)				
	Property rates <i>A general charge for property ownership.</i>	Targeted rates <i>A charge for specific projects or services.</i>	Development contributions <i>Charges to help fund new growth infrastructure</i>	Public transport fares <i>A user charge for public transport services.</i>
Who sets prices	Local government Local government sets property rates.	Local government Local government sets targeted rates, which can be for a specific project or service.	Local government Local government sets development contribution charges.	Public transport authorities Fares are set by the relevant public transport authority (generally a regional council or unitary authority).
Who pays	Property owners Property owners pay local government rates.	Property owners Property owners pay targeted rates.	Property developers Property developers pay development contributions for their share of the infrastructure needed (including land transport) to service their developments.	Public transport users Passengers on public transport services pay their fares at the time of use.
How prices are set	Councils typically determine the total amount of funding they need to collect from rates to fund their agreed activities (in addition to other funding sources). This total is then distributed across the individual properties.	Targeted rates are set to raise funds for specific projects and/or services, with the costs spread across all ratepayers, or specific ratepayers in certain areas.	Charges are set based on the estimated proportion of cost attributable to new urban growth. This depends on the type and size of development, the capital expenditure on each type of infrastructure provided.	Fares are set by individual public transport authorities, whose pricing policy objectives reflect the region they serve. Fare revenue offsets the cost of service delivery, which may not fully recover costs.

Current system settings - pricing structures (1 of 2)

Pricing structure overview

Pricing in the land transport sector consists of a combination of fixed and variable pricing:

- **Fixed pricing.** Fixed pricing is charged based on access to the network regardless of the level of use. In the land transport sector, there are only a few examples of fixed pricing as the nature of the land transport network means pricing is predominantly based on use. Key examples of fixed pricing include motor vehicle registration and licensing fees, property/targeted rates and the initial cost of a transit card for public transport networks.
- **Variable pricing.** Variable pricing is based on usage behaviour, whether volume, rate, frequency, or timing. This is more commonly adopted in the land transport sector, with key examples including fuel excise duty, road user charges, public transport fares, tolls and track user and access charges.
- **Peak demand pricing.** Peak demand pricing (congestion pricing) is not currently implemented in the land transport sector in New Zealand. However, there have been discussions about using it to help manage peak demand on Wellington urban motorways and in the Auckland CBD.

The table on the next page provides more detail on the pricing structures adopted within the land transport sector.



Current system settings - common pricing structures (2 of 2)

Land transport pricing structures			
	Network users	Fixed	Variable
Road network	Private vehicle owners (private and commercial vehicles, and active road users)	<ul style="list-style-type: none"> Initial vehicle registration fee Annual vehicle licence fee Property rates (for property owners) Targeted rates (for property owners) 	<ul style="list-style-type: none"> Fuel charge (cents per litre) includes: <ul style="list-style-type: none"> Fuel excise duty Accident Compensation Corporation (motor vehicle account) Regional fuel tax (if applicable) Petroleum or engine fuels monitoring levy Road user charges (\$ per km by axle load category) Tolls (\$ per trip) Parking charge (\$ per use or per hour)
Rail network	Freight and passenger	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Track user charge (\$ per gross tonne kilometre) for rail freight operators Track access charge (\$ per tonne-kilometre) for passenger service operators Agency admin fee paid by operators (\$/hour of work)
Public transport network	Urban passenger rail	<ul style="list-style-type: none"> Transit card (where applicable) Property rates / targeted rates 	<ul style="list-style-type: none"> Journey charge (\$ per trip - generally varies by distance)
	Public buses	<ul style="list-style-type: none"> Transit card (where applicable) Property rates / targeted rates 	<ul style="list-style-type: none"> Journey charge (\$ per trip - generally varies by distance)

Current system settings - key trends

In addition to the current system settings, emerging trends in the land transport sector have been identified to support the current pricing analysis. These trends highlight the opportunities and challenges facing the land transport sector - with the central challenge for the sector being current and ongoing funding. **The key trends are described at a high-level below.**

The funding challenge in land transport

- The funding challenge within the land transport sector is ongoing, contributed to by some of the other challenges facing the sector, explained on the right. The funding challenge relates to three key areas:
 - **Insufficient funding.** There is not enough funding within the land transport sector to respond to future investment, maintenance, and operational needs, which will require a significant increase to keep networks operational and meet demand.
 - **Funding structures.** The existing funding structures within the land transport sector result in funding across road, rail and public transport being highly fragmented. Over time, there has also been an increased level of investment from the Crown, reducing the efficacy of the user-pays cost-recovery model.
 - **Private funding.** There are examples of private funding in the land transport sector, however there is not yet an established central government approach or strategy to the use of private funding to support infrastructure investment.







Other trends

- **Decarbonisation of the land transport sector, supporting the transition to net-zero.** This poses a significant challenge for the land transport sector, and will require shifts and investment across the road, rail and public transport networks in the coming years. Although steps are being taken within the sector - including reducing kilometres travelled by light vehicles, reducing freight transport carbon emissions and adoption of low emission vehicles - this challenge remains central. Key areas of focus identified by Waka Kotahi NZ Transport Agency include reducing greenhouse gas emissions, improving biodiversity, resource efficiency and waste, and reducing embodied carbon.
- **Decarbonisation poses financial challenges for the land transport sector.** The shift to electric vehicles, public transport and active modes will reduce revenue from fuel excise duties and road user charges on diesel vehicles, the two predominant funding sources for the sector.
- **Improving resilience of land transport.** As with other infrastructure sectors, resilience in land transport is a critical and ongoing challenge. Ageing and insufficient infrastructure creates risks to the operation of the network and means that the sector is not well-positioned to respond to future challenges. The 2021-31 and draft 2024-34 Government Policy Statements on Land Transport reflect greater emphasis on resilience.
- **Increased consideration of additional pricing mechanisms.** For example, congestion pricing, a dynamic pricing strategy designed to regulate demand by increasing prices without increasing supply. This has been considered in recent years, but has not yet been implemented.

Current pricing analysis - land transport scorecard



The current system settings for the land transport sector provide the foundation for understanding the sector's performance against the proposed Pricing Goals and Principles. The scorecard below provides a summary of the land transport sector's performance, demonstrating that the land transport sector has a mixed performance against the proposed Pricing Goals. This reflects the public nature of governance, planning and investment within the land transport sector - which results in fragmentation in the approach to funding through a mixture of pricing mechanisms as well as Crown investment. **The remainder of this section includes the detailed analysis that informed this scorecard, and the key opportunities identified through this analysis.**

Current pricing analysis scorecard - land transport

Goal	RAG rating	Sector direction	Rationale
Goal 1 Pricing mechanisms should guide investment decisions			<p>The land transport sector is considered to be underperforming against Goal 1. The following factors informed this assessment:</p> <ul style="list-style-type: none"> • The complexity and fragmented nature of the current system settings hinder clear price signalling to inform investment decision-making. • Central and local government transport and non-transport policy priorities, rather than pricing, inform investment decision-making. • Usage-driven evidence to inform investment decision-making is limited. • Central and local government bear the majority of the investment risk in land transport, while large benefits flow to the private sector. <p>Focus on multi-modal assessments combined with improving land transport user data is expected to lead to improved performance for Goal 1.</p>
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions			<p>The land transport sector is considered to have a mixed performance against Goal 2. The following factors informed this assessment:</p> <ul style="list-style-type: none"> • The use of pricing to inform usage behaviour is limited across the land transport network. • Transport and non-transport policy objectives, as well as affordability challenges, limit the ability for the whole of life costs of the land transport network to be reflected in pricing. • For the road network, most road use externalities are unpriced. Bus and rail network use may reduce externalities from private vehicle use. • Public transport users are heavily subsidised by vehicle owners and ratepayers, with road freight subsidised by other road users. • There is transparency in all explicit user prices, however there is room to improve transparency around price development and how users pay for the transport system. <p>There is limited scope for improvement as current system settings prevent sector wide implementation of cost recovery from users.</p>
Goal 3 Pricing should incentivise broadly distributed benefits			<p>The land transport sector is considered to have a mixed performance against Goal 3. The following factors informed this assessment:</p> <ul style="list-style-type: none"> • There is very limited access to transport alternatives for many users to enable them to make price-quality trade-offs. • Efficiency improvements are more likely to be reflected in improved quality of service than price, with efficiency currently driven by funding limits and affordability constraints, rather than directly through pricing or competition. <p>There appears to be little impetus for improvements in the land transport sector performance against Goal 3 at this time.</p>

Goal 1: Pricing mechanisms should guide investment decisions

Goal 1 scoring overview

Goal	RAG rating	Sector direction
Goal 1 Pricing mechanisms should guide investment decisions		

The land transport sector is considered to be underperforming against Goal 1. This is due to the current system settings resulting in misalignment of investment risk and benefits, and the incentives for investment are driven by policy rather than pricing. This scoring is informed by the detailed analysis of the land transport sector against the proposed Pricing Principles that fall under Goal 1:

1. **Quality of service:** Pricing should create incentives to improve the quality of service in ways that users want to pay for
2. **Network configuration options:** Pricing should reflect differences in whole of life costs between network configuration options
3. **Level of investment:** Pricing should incentivise a level of investment which balances the associated benefits and costs
4. **Risk allocation:** Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

Principle 1

Quality of service: Pricing should create incentives to improve the quality of service in ways that users want to pay for

The land transport sector currently underperforms against this principle:

- **Price setting is fragmented, resulting in prices failing to send signals for investment in quality.** Pricing of road and rail networks includes a range of charges - including fuel taxes, road user charges, development contributions, property rates, user-paid parking, vehicle licensing fees, public transport fares, and tolls. While public transport fares can signal user preferences, this complex range of charges fails to create incentives for suppliers to improve quality. The ability for users to pay (or indicate they would pay) for higher quality service is limited by common network use and the policy settings in place.
- **Usage-driven evidence to inform investment decisions is limited.** There is currently good information on land transport usage (eg, traffic count sites and public transport usage), but limited information on willingness to pay for quality of service, especially under scenarios that would offer greater viability of mode choices to a larger pool of users. Instead, key policy documents are used to guide decisions on investment.

Goal 1: Pricing mechanisms should guide investment decisions

Principle 2

Network configuration options: Pricing should reflect differences in whole of life costs between network configuration options

The land transport sector currently underperforms against this principle:

- **Land transport pricing does not currently reflect its true cost, because policy-based user charges are less than the cost of provision.** In 2023, the Ministry of Transport estimated the financial cost recovery ratio of personal transport (measured as user charges/public sector costs) is 49.1%. The shortfall would be far greater if externalities were included. This mutes potential signals for alternative configurations by making road transport (specifically transport by private vehicle) more competitive than it would be if all costs were priced.
- **Network configuration planning and decision-making currently fall across a range of entities - including central and local government.**
- **Limited choice within the current land transport sector creates challenges in considering and assessing whole of life costs of alternative network configurations.** Taking the road network as an example, existing challenges with the provision of public transport and a reliance on private car use limits understanding of the costs and benefits of different network configurations. This risks creating path-dependency in decision-making.

Principle 3

Level of investment: Pricing should incentivise a level of investment which balances the associated benefits and costs

The land transport sector currently has a mixed performance against this principle:

- **The level of investment in transport is influenced by a range of policy, rather than pricing, considerations.** This weakens signalling to inform appropriate level of investment and creates challenges in measuring investment efficiency. In particular, while peak usage patterns and flow-rates are considered, the largest sources of investment in the land transport system (fuel excise duties and road user charges) are set in the absence of demand signals on the level of investment, and instead are influenced by a range of both transport and non-transport policy priorities. Two recent examples of this include:
 - The 2022 decrease in fuel excise duties and road user charges, designed to alleviate cost-of-living concerns, which had no connection to the appropriate level of investment in infrastructure.
 - The road user charges exemption for plugin electric vehicles, intended to stimulate uptake for emissions reduction purposes, ignoring the costs of the use of these vehicles on the roading network.
- **Transport investment has a standardised economic appraisal process to assess costs and benefits.** Waka Kotahi's Monetised Benefits and Costs Manual provides a consistent framework to quantify benefits and costs so that different investment options can be compared. It does not offer guidance on setting prices, however, it is used to compare options that have different user charges (e.g. fares or tolls). This contributes to funding decisions including public contributions to optimise value for money. This incentivises efficient (economic and financial) levels of investment.

Goal 1: Pricing mechanisms should guide investment decisions

Principle 4

Risk allocation: Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

The land transport sector currently has a mixed performance against this principle:

- **Central government bears the majority of the investment risk in land transport, while large benefits flow to the private sector.** This is due to the nature of the funding model. Examples of where publicly funded transport improvements create benefits for the private sector include:
 - Land value uplift from transport improvements generate significant benefits for the private sector. For example, in 2015, Auckland Transport estimated approximately \$1 billion of property value uplift in the areas surrounding each new City Rail Link station.
 - In 2023, Te Waihangā estimated that New Zealand households spend 11.9% of total household expenditure on private transport, and only 1.9% on public transport. Private transport consists mostly of vehicle purchase and maintenance costs, which flow to the private sector, but rely on publicly funded road networks to support vehicle demand.

The dispersed nature of other benefits delivered by transport investment (eg, connectivity and accessibility) reflect significant cross subsidies.

- **Competitive tendering for delivery can allocate risk away from the public sector, delivering potential reward to those bearing the risk.** Procurement processes can help with allocating risks to the party best placed to manage them. The level of competition in tender responses is influenced by the pricing regime, since it defines the reward prospects for bearing risk, which ultimately impacts costs and therefore prices. Also, Government may have a role in bearing demand risk so that private providers can focus on the delivery risk which is within their control.

- **Development contributions do not allocate risk well among ratepayers, developers and other stakeholders.** For connection of homes and businesses to the land transport network, prices take the form of development contributions and ratepayer-funded investment in renewals and level-of-service improvements. Some developer funding and delivery of connecting infrastructure occurs, which is well aligned to **principle 4**. However, the development contribution pricing system does not allocate risk well among ratepayers, developers, and other stakeholders. Case study 1 on the next page explores this issue.



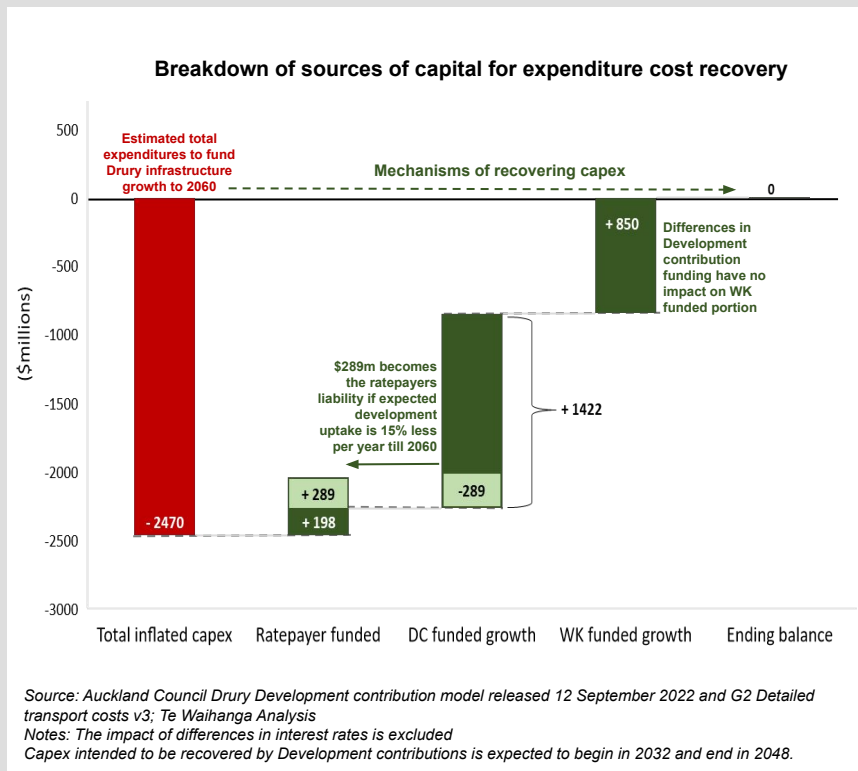
Goal 1: Pricing mechanisms should guide investment decisions

Case study 1 - Development contributions in practice: Drury

Development contributions are a pricing mechanism by which local government charge property developers for a share of the costs of the infrastructure needed to service their developments. These contributions support recovery of a significant amount of the costs of transport infrastructure, and are set based on type and size of development, the capital expenditure on each type of infrastructure provided, and an estimate of the proportion of infrastructure benefits accruing to new urban growth as opposed to benefits enjoyed by existing inhabitants.



The example of the Drury growth area in the south of Auckland demonstrates the distribution of risk when recovering infrastructure costs via development contributions. Expenditure commitments occur before development, so are planned according to forecasts of development uptake. In Drury, c.60% of expenditure is intended to be funded through development contributions, with most of the remainder coming from Waka Kotahi. However, the development contribution pricing arrangements (which are partly at the discretion of Auckland Council, and partly limited by the wider regulatory framework) rely on the timing and quantity of development contributions matching the forecast. If the growth falls short of expectations, the remaining capital expenditure commitment falls to ratepayers.

The graph to the right shows the change in funding breakdown if expected development uptake is 15% less than expected, which would lead to \$289 million of the cost being shifted to ratepayers. This is a decrease of about 20% of the intended development contribution funding, but increases the amount ratepayers fund by about 146%. This risk is not symmetrical. If development uptake is greater than expected, developers are entitled to rebates of their contribution to ensure that Council does not over-recover costs. Further, the value created by the investment is largely captured by the owners of land, which may include developers depending on the timing and arrangements of developer involvement. **This case study is a demonstration of a poor application of Principle 4, as it does not allocate risk appropriately.**



Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Goal 2 scoring overview

Goal	RAG rating	Sector direction
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions		

The land transport sector has a mixed performance against Goal 2. Across the land transport sector, there are large unpriced externalities and limited pricing signals to encourage efficient use of the network. This scoring is informed by the detailed analysis of the land transport sector against the proposed Pricing Principles that fall under Goal 2:

- Usage behaviour:** Pricing should encourage efficient and appropriate use of the network
- Whole of life costs by type of use:** Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour
- Signalling externalities:** Prices should signal both positive and negative externalities generated by the network and its use
- Appropriate user-funded subsidies:** Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave
- Transparent and reasonable implementation:** Pricing should be developed and implemented in a transparent and reasonable manner

Principle 5

Usage behaviour: Pricing should encourage efficient and appropriate use of the network

The land transport sector currently has a mixed performance against this principle:

- The use of pricing to inform usage behaviour is limited across the land transport network.** For example:
 - Congestion pricing to manage traffic at peak periods by incentivising those who are able to shift travel time has been considered but not yet implemented.
 - The availability of free parking on public roadsides distorts usage behaviour as the opportunity cost of land and building area used for parking at the destination is not signalled to users. In effect, this is a subsidy from local government to motorists. Case study 2 below and 3 on the next page explores this issue in more detail.

Case study 2 - Cost of infringement compared to parking

Schedule 1b of the Land Transport (Offences and Penalties) Regulations 1999 (revised 2006) sets the maximum penalties for exceeding street parking restrictions. This implicitly values the use of all road space equally regardless of location. It also sets the penalties in nominal dollar terms with no reference to inflation, meaning the real maximum limit decreases over time. **This is a demonstration of poor alignment with Principle 5, as these characteristics create perverse incentives for use and misuse of the network.**

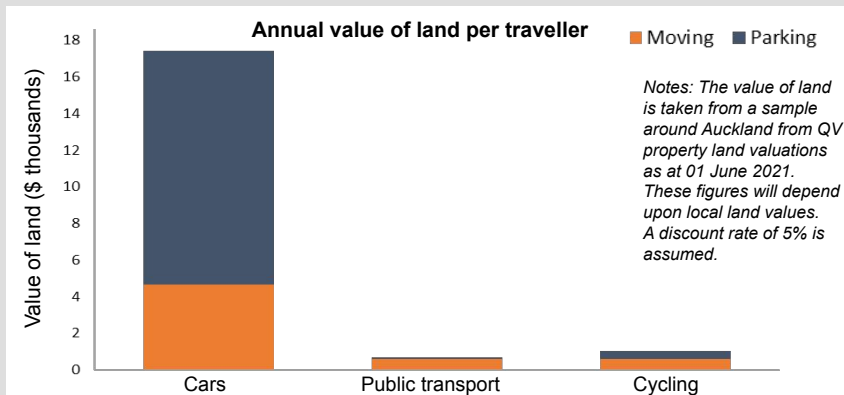
Source: Land Transport (Offences and Penalties) Regulations 1999 (revised 2006), Schedule 1b

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Case study 3 - The unpriced cost of space

Externalities are not well priced into land transport costs. Road safety, environmental impacts, long-term health effects, congestion costs, opportunity cost of land use, noise, and aesthetic impacts are not priced into charges for road or rail networks.

The opportunity cost of space required by cars on the transport network is an externality so large in comparison to public transport or cycling that it distorts usage levels for all modes. Car travellers take up about 25 times more space than public transport, and about 16 times more than cycling. In Auckland, in 2021, the cost of land a car traveller used for parking is c.\$13,000 per year, much of which is provided free of charge by local government. In the absence of prices that reflect costs and efficient use, the result is over-consumption of private vehicle use. **This demonstrates poor alignment with Principle 5 as it does not encourage efficient use of the network, and also of Principle 6 as the cost of land for parking is not reflected in prices.**



Sources: Litman, T., NCE Cities - Sprawl Subsidy Report; QV Property analysis

Principle 6

Whole of life costs by type of use: Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour

The land transport sector currently has a mixed performance against this principle:

- **Transport and non-transport policy objectives, as well as affordability constraints, limit the ability for the whole of life costs of the network to be reflected in pricing.** This results in the use of subsidies to manage operational costs and central and local government investment. Key examples include:
 - For rail, pricing does not reflect whole of life costs, and Auckland Transport is not able to afford KiwiRail's track access charges in order to maintain network serviceability. This results in either a reduction in passenger rail services or intervention by central government to manage costs.
 - For public transport, users are heavily subsidised by funds raised from vehicle owners/users and ratepayers. This is also the case for road freight, however this is done in a way that causes minimal distortion in road use.
- There are some notable exceptions to the above in the land transport sector, including the use of toll roads and road user charges. These are examples of good implementation, as demonstrated by case study 4, overleaf.

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Case study 4 - Prices which reflect use

Road user charges are designed to signal usage effects to users and recover network maintenance costs based on damage done to the assets. These are the most widely implemented usage-based charges in the land transport sector. Other examples include congestion pricing to incentivise network-optimising behaviours - however these are yet to be implemented in New Zealand. By contrast, while fuel taxes vary by total usage and partly signal the external cost of emissions in alignment with Principle 7, they send no signals for timing or location of use of roads.

Axle loading overview

Axle loading is an engineering concept that measures the intensity of weight applied on the road through the wheels of a vehicle. Damage to the road network increases exponentially with higher axle loads. Road user charges reflect this trend, but may not fully reflect the cost incidence of different vehicle classes.

As demonstrated in the graph to the right, road user charges increase roughly exponentially as the axle loading equivalent increases. Note that the chart is an approximation to show the general trend, given the complexity in displaying the range of relationships between axles, vehicle weight and road user charges that are embedded in the charging regime.

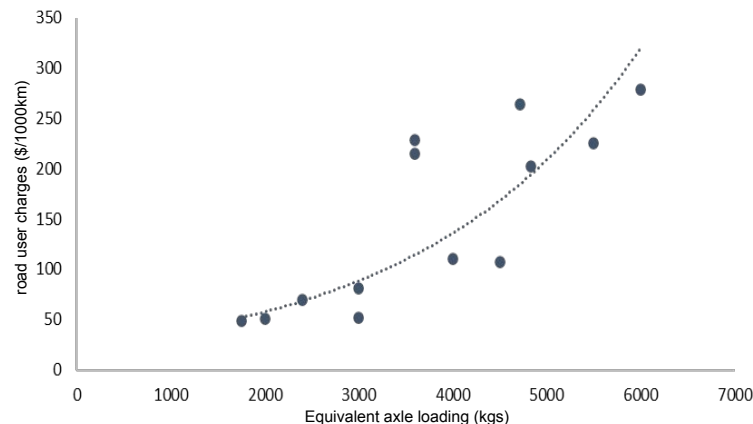
Road user charges are a demonstration of alignment with Principle 6, as the effects on the whole of life costs of the network from the different types of use are reflected in prices. As the charge is a price per 1000km, this is also a good demonstration of alignment with Principle 5, signalling the effects of usage behaviours on the costs of network provision.

Key definitions

Equivalent axle: Counts vehicles with twin wheels on a single axle, as a double axle equivalent. This is to give a better representation of weight distribution across wheels.

Equivalent axle loading: Weight of vehicle/axle equivalent. A measure of the distribution of weight bearing per set of wheels.

Road user charges versus equivalent axle loading



Source: Waka Kotahi, road user charges rates and transaction fees. Rates are from 1 March 2023 to 30 June 2023

Note: the highest weight in each weight band has been used. An assumption for the maximum weight of each type of vehicle has been made based on the type of vehicle and number of axles.

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle 7

Signalling externalities: Prices should signal both positive and negative externalities generated by the network and its use

The land transport sector currently underperforms against this principle:

- **For the road network, the majority of road use externalities are unpriced.** Externalities for the road network include congestion delays imposed on fellow users, health effects for users who choose alternative modes, delays, discomfort, and lack of access imposed on active modes, safety costs of the road transport system, and environmental costs (noting these are partly signalled through the carbon price embedded in fuel costs and regulatory emissions requirements). If these externalities were priced, alternative modes may become more attractive, and users may be willing to pay more for those alternatives eg, bus and rail.
- **For the bus and rail networks, externalities are often driven by the degree to which use is diverted from private vehicles,** leading to prevention of road-based externalities. A cross-subsidy of the bus and rail networks might be appropriate, funded by revenue from fuel excise duty and road user charges, to encourage reduction of negative externalities from road transport.

Principle 8

Appropriate user-funded subsidies: Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave

The land transport sector currently has a mixed performance against this principle:

- **Currently user-funding is insufficient to cover revenue shortfalls.** The NLTP is funded by the NLTF, which reflects revenue from land transport user charges. However, revenue shortfalls occur due to increased costs or changes in priorities. Shortfalls may impact quality of service, which may distort user behaviour. However, additional Crown funding may supplement the NLTF. For example, 24% of the NLTP 2021-24 was funded by the Crown.
- **Local funding model in transport results in cross-subsidies.** Those with higher value properties effectively cross-subsidise those with lower value properties, given the nature of the local funding model for the transport network through property rates being disconnected from usage. This has no impact on user behaviour at current price levels, as they are not significant compared to house prices.

Case study 5 - Electric vehicles road user charges exemption

Recent government policy has given electric vehicles an exemption from road user charges until 31 March 2024. The intention is to generate a pricing incentive to reduce the emissions that are being generated in the transport sector. However, road user charges are designed to send price signals about how usage (particularly for heavy vehicles) imposes costs on the network, and therefore an exemption dampens this signalling. **This case study is a useful demonstration of alignment with Principle 7, as it shows how prices can incentivise usage behaviour to support positive externalities (in this case improved environmental outcomes). However, the choice of road user charges as the mechanism demonstrates poor alignment with Principles 5 and 6, as it dampens signals about appropriate use and whole of life costs of the network.**

Source: Road User Charges (Exemption Period for Light Electric RUC Vehicles (order 2012), New Zealand Government

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle 9

Transparent and reasonable implementation: Pricing should be developed and implemented in a transparent and reasonable manner



The land transport sector performance is mixed against this principle:

- **There is transparency in all explicit prices**, including:
 - Road user charges and tolls are disclosed and described
 - Vehicle licensing fee components are itemised on invoicing
 - Development contribution policies are publicly consulted and published
 - Bus and rail fares are established by public transport authorities and are disclosed.
- There may be room for improvement in the description and transparency of how the prices themselves are developed.
- However, because pricing is fragmented across different modes, providers and sources, it is difficult to get an overall view of how we pay for the transport system.



Goal 3: Pricing should incentivise broadly distributed benefits

Goal 3 scoring overview

Goal	RAG rating	Sector direction
Goal 3 Pricing should incentivise broadly distributed benefits		

The land transport sector has a mixed performance against Goal 3. Land transport options exist for many users at different price points. However, these can sometimes send the wrong signals about cost and availability through the current pricing regimes. This scoring is informed by the detailed analysis of the land transport sector against the proposed Pricing Principles that fall under Goal 3.

10. **Benefits of efficiency gains:** Pricing should provide incentives for suppliers to lower prices as they become more efficient
11. **Price-quality trade-offs:** Prices should allow users to make price-quality trade-offs
12. **Appropriate publicly-funded subsidies:** Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network, investment in it, or both.

Principle 10

Benefits of efficiency gains: Pricing should provide incentives for suppliers to lower prices as they become more efficient

The land transport sector currently has a mixed performance against this principle:

- **Efficiency improvements are more likely to be reflected in improved quality of service than price.** Incentives to providers for cost efficiency arise through funding limits and affordability rather than directly through pricing or competition (except in the case of toll roads). **Case study 6 is an example of this.** Improvements in quality of service typically come through the ability to do or deliver more within the funding constraints (eg, additional services or improvement projects). In part this is driven by the ongoing deficit in transport infrastructure and services, so there is always the need to 'do more'. Funding constraints or higher than expected costs may also be reflected in lower service quality or quantity.

Case study 6 - Lime scooters

Lime Micro Mobility (Lime) was one of the two micro-mobility operators initially licensed in Auckland, which required an application deposit and monitoring deposit on approval. These prices are currently set at \$1000 and \$7,500 respectively. Lime was allocated a licence to operate 450 e-scooters in the Auckland city centre, to rent out in return for a fee from its customers, which includes a fixed access fee and a variable charge based on use. The benefits Lime receives from using the network are likely disproportionate to what it is charged. However, the benefits of the micro-mobility innovation are shared with users and it may support the network to run more efficiently to the extent that it diverts vehicle trips to less space-consuming micro-mobility trips or speeds up walking trips where users are willing to pay for it. **This aligns with Principle 10 as it supports in sharing the benefits of innovation, and Principle 5 as it may support more efficient use of the network.**

Goal 3: Pricing should incentivise broadly distributed benefits

Principle 11

Price-quality trade-offs: Prices should allow users to make price-quality trade-offs

The land transport sector has a mixed performance against this principle:

- **No or very limited access to practical transport alternatives to enable users to make price-quality trade-offs.** In most regions, there is either no or limited practical alternatives to car usage (eg, for trips where walking is not practical).
- **Public transport enables users to switch modes as a form of price-quality trade-off in some instances, but this is often not competitive with private vehicle use.** Public transport fares are determined by public transport authorities and are set at levels that enable partial cost recovery, but do not signal the full costs of service delivery. However, even at these subsidised levels, public transport struggles to compete with privately owned vehicle trips (as currently priced) as the primary mode for most households. The willingness to pay for public transport should be considered within the context of the effective subsidies (through unpriced externalities) for the dominant substitute - private vehicle trips.
- **Price and quality trade-offs are well applied in toll roads, and available in the form of mode choice and private service options across some of the network.** Case study 7 addresses toll roads.

Case study 7 - Toll roads: targeted prices

Toll roads are sections of the network where users are charged at the point of use in order to recover the costs of investment over the asset lifetime (or until the debt is repaid). New Zealand currently has three toll roads: the Northern Gateway, Takitimu Drive and the Tauranga Eastern Link. A summary of the price of each toll is provided in the table below.

Toll Charges (August 2023)	Northern Gateway	Takitimu Drive	Tauranga Eastern Link
Car, motorcycle, or light commercial vehicle (3.5 tonnes or less)	\$2.60	\$2.10	\$2.30
Heavy vehicle (over 3.5 tonnes)	\$5.20	\$5.40	\$5.60
Caravan or trailer	No extra charge	No extra charge	No extra charge

For each toll charged, approximately 80 cents goes toward covering the costs of operation and the remainder is used to pay down the debt (interest and principal) used to fund the original investment, as well as goods and services tax (GST) on the fee.

This case study demonstrates alignment with Principle 6 as toll roads support whole of life cost recovery, and alignment with Principle 11 as legislation limits tolling to new roads where a free alternative route exists, thus providing a price-quality trade-off.

Source: NZ Transport Agency, Tolls and fees

Goal 3: Pricing should incentivise broadly distributed benefits

Principle 12

Appropriate publicly-funded subsidies: Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network or investment in it, and where these benefits would exist even when pricing already aligns with principles 1-11

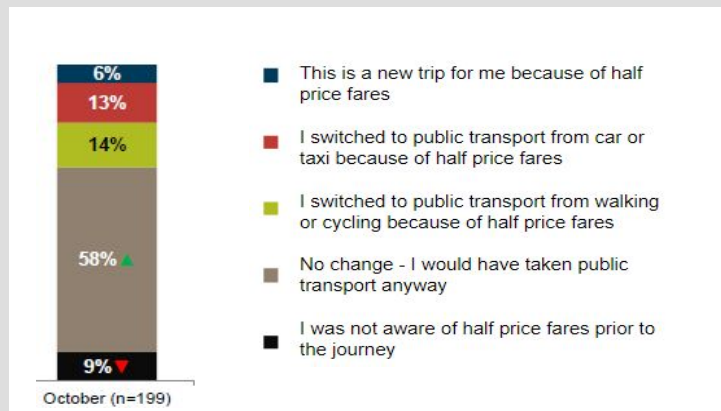
The land transport sector currently has a mixed performance against this principle:

- **Large subsidies in public transport are justified in principle by the broad net benefits of this service, however subsidies in land transport are extensive and confusing.** The subsidisation of public transport makes it more affordable for those who rely on it. Enabling these people to better participate in society is beneficial overall. The subsidy is also beneficial in that providing public transport services is more efficient than investing in additional road capacity for example (eg, a bus lane can be at least five times more efficient at moving people than a regular vehicle lane).
- **Investment in rail generates broad net benefits to society, potentially justifying a subsidy.** In addition to benefits from increased public transport usage (described above), rail network improvements enable more freight to be transported by rail instead of by truck, reducing freight emissions.
- **Private road transport is effectively subsidised by local government budgets, free use of public land for parking, and the high opportunity cost of land for roads.** These circumstances are not consistent with the condition of widely distributed benefits from greater use of the network or investment in it.
- **The Total Mobility scheme provides a publicly-funded travel subsidy to those who qualify.** Funded in partnership by local and central government, the Total Mobility scheme assists eligible people, with long-term impairments to access appropriate transport to meet their daily needs and enhance their community participation.

Case study 8 - Impact of half price fares

The Government offered half-price fares for public transport trips nationwide between April 2022 - June 2023. Surveys of users (conducted May- October 2022) showed considerable responsiveness to price during this temporary price change, with a third of respondents increasing their use of public transport in response to the subsidies.

13% of respondents switched to public transport from a car or taxi, a lower carbon alternative, while 6% of people made a trip that they otherwise wouldn't, suggesting higher participation in society. This is consistent with **Principle 12, providing net benefits through greater use of the network.**



Source Waka Kotahi RN009A - Impact of half-price public transport fares - a research note February 2023

Land transport - key opportunities for improvement (1 of 2)

Key opportunities for improvement

Of the four sectors, the land transport sector has the greatest room for improvement in its pricing performance. This reflects how the current system settings of the sector do not support competition or effective regulation - and instead reflect public sector governance and policy to support infrastructure design, delivery and service provision. While the use of pricing within the land transport sector will not be effective or appropriate in all cases, there is opportunity for existing pricing mechanisms within the sector to be used more effectively and/or additional mechanisms to be introduced. Mechanisms can be used to improve signals for availability and cost of networks, pricing for externalities and to better align investment risk and benefits.

The key opportunities for improved pricing performance in the land transport sector include:

- **Reduction in non-priced use.** Many users do not pay directly for the transport services they use (eg, free on-street parking, electric vehicles' exemption from road user charges), which harms cost-recovery and incentivises inefficient use. System settings prevent sector-wide implementation of cost-recovery from users.
- **Building an evidence base to inform decision-making.** There is a misalignment of investment risk and benefits, and the incentives for investment are driven by policy rather than pricing. More explicit pricing of externalities (such as through congestion pricing) would enhance options assessment and network efficiency, as well as improved pricing to signal the willingness to pay for changes in service levels and transport mode options.
- **Improving price signals.** Existing pricing mechanisms and exceptions (road user charges, electric vehicle subsidy, fuel tax) lack signalling power for investment and could be improved. Case study 9 and case study 10 (on the next page) demonstrate the potential for price signalling improvements.

Case study 9 - The role of technology and data

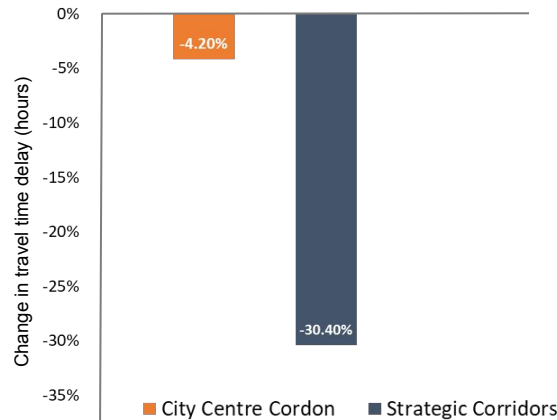
Technology plays a pivotal role in optimising infrastructure utilisation. Technology that facilitates the rapid collection and analysis of network usage data enables the design of schemes to support the efficient management and use of infrastructure and provides insights for pricing strategies.

- **Dynamic Pricing - TEXpress.** The TEXpress network of managed lanes in Texas maintains traffic at a minimum speed of 50 mph through real time monitoring of traffic flow and dynamic pricing. There are more than 100 miles of TEXpress open on eight North Texas roadways. There are two types of lanes on the TEXpress, one has fewer entries and exits and does not incur a toll. The other is managed by a fluctuating toll which is designed to signal to the user the price for expecting to travel at 50 mph. High occupancy vehicles can pre-register for a 50% discount on peak charges.
- **Real-time signalling.** An electric vehicle charge-up scheme in California allows users to benefit from discounted electricity during periods of excess supply. Electric vehicle owners receive SMS notifications of charge up periods when electricity is offered at a discount for vehicle charging. The network operator schedules these events, typically in the afternoon, when excess solar generation causes system supply to exceed demand. The combination of geographic system data, communications technology and half hourly customer metering are critical to this offering.
- **Congestion charges.** Congestion pricing has been demonstrated to be highly effective at managing road capacity and improving efficiency by reducing traffic, resulting in higher average travel speeds, improved trip reliability and higher public transport utilisation. Singapore, London, Dubai, Milan, Gothenburg and Stockholm all utilise congestion pricing regimes. The European schemes ringfence the revenue for transportation expenditure, and in Milan this is specifically for public transport.

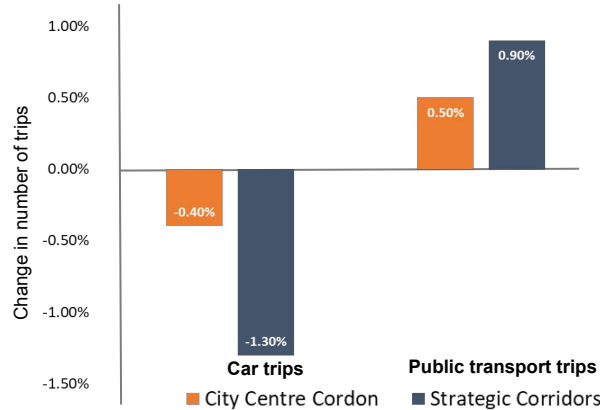
Land transport - key opportunities for improvement (1 of 2)

Case study 10 - Congestion pricing: an example of what could be

Total change in travel time delay during morning peak, in 2028



Change in mode of transport during morning peak, in 2028



Source The Congestion Question Technical Report, July 2020

As part of The Congestion Question (2020), options for introducing congestion pricing schemes in Auckland were identified and analysed against a baseline without a scheme. The two congestion pricing options compared in the graphs to the left are:

- **Strategic Corridors:** Vehicles are charged to travel on the strategic and arterial network in the Auckland region.
- **City Centre Cordon:** Vehicles are charged to enter and exit the city centre during peak travel periods. Covers a small area.

The graph on the left shows an expected decline in travel time delay during the morning peak under both the City Centre Cordon and Strategic Corridor schemes, compared to the baseline. However, there is a substantial difference between the two schemes - the Strategic Corridor scheme is much more comprehensive, expanding the proportion of trips subject to the congestion pricing scheme. The result shows pricing has the potential to shift user interactions with the network in ways that improve efficiency (**principle 5**) and better reflect the lower external costs per trip of public transport compared to travelling by private car (**principle 7**).

The graph to the right shows the expected changes in the number of car and public transport trips during the morning peak period by 2028 under the two options. The critical comparison is between the reduction in car trips (a reflection of the cost burden to those users) and the reduction in travel time delay in the left-side graph (the external benefits of those foregone trips). This demonstrates that even a marginal reduction in trips can create a substantial reduction in time delay, reflecting the physical nature of congested traffic flow.



2b. Water

Current system settings - scope

Water sector - overview

The water sector in New Zealand is currently owned and operated by local government - either local government or Council Controlled Organisations in the case of Auckland and Wellington - with central government providing the legislative framework and central policy settings that guide local government service delivery. The key components of the water sector are water supply, wastewater and stormwater - and more detail on these components is included on the right.

Pricing is a key feature of the provision of water services in New Zealand (either directly through water bills or indirectly through rates), however local government is not required to ring-fence the costs and revenue associated with the delivery of water services - which constrains the ability to recover costs.

The water sector is currently going through a period of significant change - as part of the water services reform programme commenced in 2020. This reform programme seeks to improve the safety, reliability and affordability of water services in New Zealand, focusing on the structural and legislative elements of the water sector. Given the specific scope and direction of reform is uncertain, the current system settings section is an overview of the existing settings within the water sector.

To provide the foundation for understanding the current pricing analysis, further detail on the current system settings for the water sector follows. This includes an overview of the sector structure and legislative framework, approach to price setting, pricing structures and key trends.

Water sector - scope

The scope for the current pricing analysis for the water sector includes water supply, wastewater and stormwater:

- **Water supply relates to the supply of drinking water, and wastewater relates to the collection, treatment and discharge of wastewater.** Water supply and wastewater operations are vertically integrated, as one entity provides both services.
 - **For water supply, the high-level process includes:** abstraction at source - treatment - bulk transmission to local networks - local distribution - retail.
 - **For wastewater, the process is effectively the reverse of water supply:** retail - local reticulation - bulk transmission out of the local network - treatment - discharge.
- **Stormwater relates to the drainage of water (particularly from hard surfaces such as roofs, roads and carparks).** Stormwater operations differ from water supply and wastewater, with stormwater being captured by the local reticulation network (which include either stormwater drains and pipes, or sustainable urban drainage systems such as ponds, streams and vegetation designed to slow down and hold water), which is then discharged. Unlike wastewater, stormwater does not require treatment prior to being discharged.

Reflecting the above, for the purposes of the current system settings overview, water supply and wastewater are considered together given the similarity in the structure and approach to their operations - with stormwater considered separately.

Current system settings - sector structure and legislative framework

Below is a high-level overview of the structure and legislative framework that governs and sets the parameters for the water sector. This is designed to provide the foundation for understanding the role of pricing within the sector. As part of the water services reform programme the structure and legislative framework for the water sector is evolving, however given this reform is still in progress, the information reflects current settings. **The next page provides a more detailed view of how this translates to price setting in the water sector.**

Water supply and wastewater

Key organisations

- **Territorial local authorities or unitary councils**, responsible for the water supply and wastewater services.
- **Council controlled organisations**, manage water supply and wastewater services in Auckland (Watercare) and Wellington (Wellington Water).
- **Taumata Arowai - water services regulator**, responsible for setting and ensuring compliance with drinking water standards.
- **Regional councils**, responsible for setting standards related to the quality of water that re-enters waterways (and other receiving environments) through the provision of resource consents for discharging wastewater.
- **Department of Internal Affairs**, responsible for local government.
- **Office of the Auditor General**, which audits local government long term plans.

Legislative framework

- **Local Government Act 2002**. Provides the framework and requirements for local government in the provision of water services.
- **Local Government (Auckland Council) Act 2009**. Provides the framework and requirements for Auckland Council to provide water and wastewater services.
- **Water Services Act 2021**. Provides the framework for the supply of safe drinking water, as well as setting obligations for wastewater networks
- **Water Services Entities Amendment Act**. Establishes 10 water services entities, to deliver water supply, wastewater and stormwater services.
- **Water Services Legislation Act**. Provides the functions and powers for the water services entities.
- **Taumata Arowai—the Water Services Regulator Act 2020**. Establishes Taumata Arowai as the water services regulator.

Stormwater

Key organisations

- **Territorial local authorities or unitary councils**, responsible for the management of the stormwater network.
- **Council controlled organisation** in Wellington (Wellington Water), manages stormwater services in Wellington.
- **Regional councils**, responsible for setting standards related to the quality of water that re-enters waterways (and other receiving environments) through the provision of resource consents for stormwater.
- **Department of Internal Affairs**, responsible for local government.
- **Office of the Auditor General**, which audits local government long term plans.

Legislative framework

- **Local Government Act 2002**. Provides the framework and requirements for local government in the provision of water services.
- **Local Government (Auckland Council) Act 2009**. Provides the framework and requirements for Auckland Council in the provision of stormwater services.
- **Water Services Act 2021**. Sets obligations for stormwater networks.
- **Water Services Entities Amendment Act**. Establishes 10 water services entities, to deliver water supply, wastewater and stormwater services.
- **Water Services Legislation Act**. Provides the functions and powers for the water services entities.

Current system settings - approach to price setting

	Water supply and wastewater	Stormwater
Who sets prices	<p>Local government and Council Controlled Organisations</p> <p>In Auckland, the Council Controlled Organisation (Watercare) sets water supply and wastewater prices, and elsewhere local government agencies are responsible for price setting.</p>	<p>Local government</p> <p>Local government agencies are responsible for setting stormwater prices.</p>
Who pays	<p>Developers and property owners</p> <p>Local government agencies and Council Controlled Organisations charge property owners for water supply and wastewater. In practice, property owners may then pass this cost through to their tenants.</p>	<p>Developers and property owners</p> <p>Local government charge property owners rates, a component of which reflects the cost of the stormwater network</p>
How prices are set	<p>Price setting is based on a flexible cost-recovery framework, which is informed by the constraints in the Local Government Act (in particular, local government agencies are not allowed to make a surplus from the provision of water services, with any additional revenue required to be reinvested); expenditure plans; and policy decisions about levels of service (e.g. security of supply, response times, water pressure). Some local government agencies may have principles to inform pricing, but this is not consistent.</p>	<p>As with water supply and wastewater, price setting is based on a flexible cost-recovery framework informed by the Local Government Act; expenditure plans; and policy decisions about levels of service. Stormwater is more often priced through developer contribution schemes. In Auckland, causer pays principles are used to determine developer contribution charges. As with the other waters, this is not consistent across local government agencies.</p>

Current system settings - common pricing structures (1 of 2)

Pricing structure overview

Pricing in the water sector is made up of a combination of fixed and variable pricing:

- **Fixed pricing.** Fixed pricing may be used to recover the fixed costs associated with water supply, wastewater and stormwater regardless of the level of use. Due to limited ring-fencing within local government of the costs and revenue associated with water service operations, in practice the full fixed costs are not recognised in pricing (e.g. some governance and operational costs are supported by wider local government operations rather than specific to water). Fixed prices in the water sector are generally set at a daily or annual charge. Developer contributions are also levied as fixed charges.
- **Variable pricing.** Variable pricing is based on use and may reflect the impact of use on the network. Some councils set variable prices in the form of a block tariff - these are volumetric charges where users pay different amounts for different consumption levels.

For water supply and wastewater, both fixed and variable pricing is adopted. Some councils use fully fixed charges, some use fully variable charges, and other use a mix of the two. There is an increasing emphasis on variable pricing to enable prices to better reflect use. To improve maturity and embed the use of variable pricing within water supply and wastewater a greater use of metering is required. For stormwater, fixed pricing is adopted as it is not possible to measure (and price for) individual use (except for some development contributions) due to the nature of the stormwater network.

Seasonally varying charges are not widely used in the water sector in New Zealand.

The tables on the next page provide more detail on the pricing structures adopted within the water sector.



Current system settings - common pricing structures for water users

Water supply and wastewater pricing structures		
	Fixed	Variable
Residential	<ul style="list-style-type: none"> Fixed charge - in form of uniform annual charge or daily fixed charge 	<ul style="list-style-type: none"> Volumetric (per cubic metre) Block tariff (a rate per cubic metre that varies according to consumption volume thresholds)
Commercial	<ul style="list-style-type: none"> Fixed charge - in form of uniform annual charge or daily fixed charge 	<ul style="list-style-type: none"> Volumetric (per cubic metre)
Industrial (extremely high users)	<ul style="list-style-type: none"> Fixed charge - in form of uniform annual charge or daily fixed charge 	<ul style="list-style-type: none"> Block tariff (a rate per cubic metre that varies according to consumption volume thresholds)

Stormwater pricing structures	
	Fixed
Urban	<ul style="list-style-type: none"> Targeted rates <ul style="list-style-type: none"> Annual charge per separately used or inhabited part of a property or; Annual rate based on the capital value of the property General rates <ul style="list-style-type: none"> Rate per capital value
Rural	<ul style="list-style-type: none"> Targeted rates <ul style="list-style-type: none"> Annual charge per separately used or inhabited part of a property or; Annual rate based on the capital value of the property General rates <ul style="list-style-type: none"> Rate per capital value

Current system settings - key trends

In addition to the current system settings, emerging trends in the water sector have been identified to support the current pricing analysis. These trends highlight the opportunities and challenges facing the water sector. They partly reflect the current water services reform programme, aimed at improving the way water infrastructure and services are planned, maintained, delivered and funded. **The emerging trends identified are described at a high-level below.**

Water services reform

Water services reform has implications for the water sector's future pricing performance, providing an opportunity to introduce improved practices. **The key areas of the current water services reform programme of relevance to the current pricing analysis include:**







- **Increased emphasis on compliance with drinking water standards.** Taumata Arowai has been established primarily to improve compliance in water services, which will improve drinking water quality in New Zealand. This emphasis will likely result in a need for increased investment to meet drinking water quality standards.
- **Rationalisation of governance of water services.** The current water services reform proposes a shift in water sector governance responsibilities. If implemented, this will change the nature and opportunity for cost-recovery in the sector - with the possibility of better ring-fencing of costs and revenue to support improved cost-recovery through pricing.
- **Potential for economic regulation.** The role of economic regulation within the water sector is being considered. Current proposals draw from the non-competitive segments of the telco and energy sectors, including establishing target revenues, funding of investment plans, pricing and customer service standards.

Other key trends in the water sector

- **Stronger emphasis on metering to support variable pricing.** There are many potential benefits that can be achieved through metering in the water sector - supported by improved technology - including building an understanding of demand and improving the efficient use of water through pricing signals.
- **Expiry of wastewater and stormwater resource consents.** In granting new resource consents for the discharge of wastewater and stormwater, regional councils are implementing greater restrictions to support improved environmental and sustainability outcomes (e.g. improving the quality of the wastewater and stormwater discharged). This trend is expected to continue, and may result in increased cost in the delivery of these services.
- **Increased adoption of sustainable urban drainage systems in stormwater.** These systems are becoming increasingly common where it is possible for them to be used in place of traditional drainage and pipe networks, to support improved environmental and sustainability outcomes.
- **Grey water recycling.** The treatment of wastewater from appliances such as showers, baths and sinks, to be re-used and fed back into a property for non-potable purposes such as flushing toilets - is an increasingly common method used to support better water resource management. It is not yet well utilised in New Zealand.



Current pricing analysis - water sector scorecard

The current system settings for the water sector provide the foundation for understanding the water sector's performance against the proposed Pricing Goals and Principles. The scorecard below provides a summary of the water sector's performance, demonstrating that while the water sector has a mixed performance against the proposed Pricing Goals, there is scope for improved performance. **The remainder of this section includes the detailed analysis that informed this scorecard, and the key opportunities identified through this analysis.**

Current pricing analysis scorecard - Water			
Goal	RAG rating	Sector direction	Rationale
Goal 1 Pricing mechanisms should guide investment decisions			<p>The water sector is considered to have a mixed performance against Goal 1. The following factors informed this assessment:</p> <ul style="list-style-type: none"> Affordability and funding challenges may limit investment in service quality, by deferring maintenance or renewal. Consideration of options for growth-related water infrastructure is not informed by pricing signals. Existing rate based charges, including Uniform Annual Charges, do not provide sufficient information to guide investment choices. <p>Increased focus on funding future investment and improving the quality of water services are expected to improve performance against Goal 1.</p>
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions			<p>The water sector is considered to have a mixed performance against Goal 2. The following factors informed this assessment:</p> <ul style="list-style-type: none"> Volumetric pricing incentivises usage behaviour, such as conservation and leak reduction, but does not target network constraints. Local government is required to recover whole of life costs, including depreciation of past investments and operating costs. There is inconsistency across the water sector for pricing positive and negative externalities. Pricing methodologies are not publicly available with the exception of infrastructure growth charges and development contributions. <p>Increased metering and more focus on user pays funding mechanisms are expected to improve performance against Goal 2.</p>
Goal 3 Pricing should incentivise broadly distributed benefits			<p>The water sector is considered to have a mixed performance against Goal 3. The following factors informed this assessment:</p> <ul style="list-style-type: none"> The Local Government Act prohibits charging in excess of costs. This means any efficiency gains must be passed to users via lower prices. However, due to the lack of ring fencing of the revenue and costs associated with water services within local government budgets it is difficult to assess how effectively this applies in practice. Pricing reflects the cost base to deliver water services, rather than price-quality trade-offs. There are limited alternatives for residential customers, however there is the option to bypass the public network and self-supply. Limited public subsidies apply for water services or water infrastructure, with services largely funded by users or ratepayers. <p>Improvements in evidence to support investment and funding decisions (for Goals 1 and 2) may also deliver improvements to Goal 3 over time.</p>

Goal 1: Pricing mechanisms should guide investment decisions

Goal 1 scoring overview

Goal	RAG rating	Sector direction
Goal 1 Pricing mechanisms should guide investment decisions		

The water sector has a mixed performance against Goal 1. Current pricing practices are not strongly aligned with investment choices and service quality options, and there are many public and private water schemes which deliver different service outcomes across the country. This scoring is informed by the detailed analysis of the water sector against the proposed Pricing Principles that fall under Goal 1:

1. **Quality of service:** Pricing should create incentives to improve the quality of service in ways that users want to pay for
2. **Network configuration options:** Pricing should reflect differences in whole of life costs between network configuration options
3. **Level of investment:** Pricing should incentivise a level of investment which balances the associated benefits and costs
4. **Risk allocation:** Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

Principle 1

Quality of service: Pricing should create incentives to improve the quality of service in ways that users want to pay for

The water sector currently has a mixed performance against this principle:

- **Where there is volumetric charging there is a connection between investment in service quality and provider revenue**, through lost revenue during bursts and periods of water restrictions.
- **There is no signal for water quality and potability through price**, with water quality standards set by policy in the form of targets for health, operational and environmental outcomes.
- **Affordability and funding challenges may limit investment in service quality, by deferring maintenance or renewal**. This challenge may be greater for those networks investing to meet significant new or incremental demand.

Goal 1: Pricing mechanisms should guide investment decisions

Principle

2

Network configuration options: Pricing should reflect differences in whole of life costs between network configuration options

The water sector currently has a mixed performance against this principle:

- **Network configuration is strongly influenced by urban planning.** While infrastructure costs are a consideration for local government, they are not well reflected in pricing.
- **Consideration of options for growth-related water infrastructure is not informed by pricing signals.** For example:
 - The reliance on per-connection fixed charges distorts signals of the costs of greenfield growth versus growth in areas with existing capacity in the network. This limits the comparison of different network configuration options based on existing signals. Watercare plans to transition toward charging a greater share of the costs of growth to the developments that cause the need for new investment. Case study 12 (overleaf) provides an example of the unintended effects of infrastructure growth planning on the wastewater network.
 - Development contributions do not reflect the full cost of growth-related infrastructure, and therefore do not enable decisions regarding network configuration to be informed by pricing. Case study 13 provides further detail on infrastructure growth charges.
- Networks are physically separated from each other, and **prices on each network are based on the costs of that network**. Those costs and prices can differ substantially, particularly rural vs urban networks.
- **Development contributions are often location-based**, and typically try to capture (at least part of) the different infrastructure costs of connecting to the existing network from different locations.

Goal 1: Pricing mechanisms should guide investment decisions

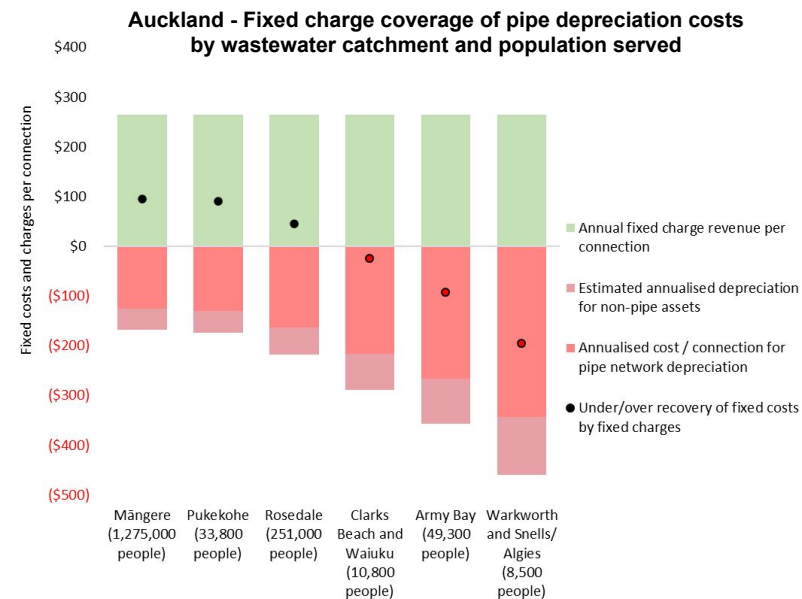
Case study 11 - Unintended effects of urban growth planning on the wastewater network in Auckland

The choices made by urban planners about where a city will grow have long-term consequences for infrastructure costs and cost-recovery. In wastewater, pipes are the largest component of capital costs, at about 70% of overall asset replacement values. Since these costs are driven by the length of pipe and extent of the area serviced, decisions about urban growth and density influence how cost-efficient the network can be.

In Auckland, existing users pay for wastewater services in two parts: a **volumetric charge** for their level of use and a region-wide **fixed charge** as a constant rate regardless of level of use.

Together, these charges are intended to cover operating costs, depreciation, and finance costs. Of these, operating costs are more influenced by usage, while depreciation and finance costs are determined by the value of the asset base. The figure to the right shows how fixed charge revenues for wastewater services in Auckland compare to the annualised depreciation cost of network assets in several catchments. As the figure illustrates, a single fixed charge amount per domestic connection does not reflect the differences in fixed costs (represented by annual depreciation) between different types and densities of network configuration.

The network configuration can be determined outside a water utilities' control by plans for urban growth and development. But urban planners do not receive a signal from fixed fee rates, which are intended to recover the cost of maintaining the existing asset base, about how their spatial decisions affect renewal costs in the long run. **This case study demonstrates poor alignment with Principle 2, because decisions on network configurations are made in the absence of price signals.**



Note: Annual fixed charge revenue was \$264 per connection per year in 2022. People per catchment, people per connection are according to Watercare Asset Management Plan 2021 (Watercare AMP). Annualised cost is the straight-line annual depreciation of asset replacement cost per km of network pipe (including both transmission and local network pipes). Non-pipe asset values for each location are assumed to reflect the network-wide average breakdown between pipe and non-pipe assets for wastewater. All cost data is from (Watercare AMP).

Goal 1: Pricing mechanisms should guide investment decisions

Principle 3

Level of investment: Pricing should incentivise a level of investment which balances the associated benefits and costs

The water sector currently has a mixed performance against this principle:

The existing rate based charging practices, including Uniform Annual Charges, do not provide sufficient information to guide investment choices. Metered unit tariffs combined with daily fixed charges tend to be uniform for each user group, and do not explicitly signal future investment needs or options. Therefore, investment decisions are driven by forecasts of population growth and hence user demand (volume and connections) as well as service quality requirements. However, unit tariffs, increasing block tariffs or per pan charges provide some signal of the impact of incremental use on total investment needs.

Case study 12 - Infrastructure growth charges price schedule

Infrastructure growth charges are a mechanism for Watercare to recover the costs of expanding infrastructure due to development growth. They are based on the relationship between forecast investment in new infrastructure needed to service growth, and the expected number of new connections to that infrastructure. They are recovered from property owners or developers who are adding new connections to the network or otherwise expanding demand. This means the charges will vary across catchments to reflect the specific investment required, as shown in the table for water and wastewater. This **demonstrates alignment with principles 2 and 3**.

Infrastructure growth charges are reduced by the net present value of future interest and depreciation payments, which are recovered through ongoing water and wastewater charges. This ensures no user is charged twice for the same asset.

Principle 4

Risk allocation: Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

The water sector currently has a mixed performance against this principle:

The service provider (either local government or council-controlled organisation) is responsible for managing the risks associated with water services. There is some risk allocation via development contributions and targeted large user pricing. Development policies, developers and urban planners have significant influence on network costs. However the financial risk predominantly sits with councils - if costs are above forecast, or usage below, councils cover that. Ultimately this means that ratepayers cover the risk, despite their lack of influence.



Area	Water and wastewater		Water only		Wastewater only	
	Excl. GST	Incl. GST	Excl. GST	Incl. GST	Excl. GST	Incl. GST
Metropolitan	\$14,903	\$17,138	\$7,451	\$8,569	\$7,451	\$8,569
Beachlands and Maraetai (wastewater only)	\$10,068	\$11,578	N/A	N/A	\$10,068	\$11,578
Helensville and Parakai	\$28,194	\$32,423	\$14,097	\$16,212	\$14,097	\$16,212
Kawakawa Bay (wastewater only)	\$35,261	\$40,550	N/A	N/A	\$35,261	\$40,550
Northeast sub-regional	\$22,119	\$25,437	\$7,078	\$8,140	\$15,041	\$17,297
Omaha/Matakana/Point Wells (wastewater only)	\$9,770	\$11,236	N/A	N/A	\$9,770	\$11,236
Owhanake (wastewater only)	\$32,360	\$37,214	N/A	N/A	\$32,360	\$37,214
Southwest sub-regional	\$23,929	\$27,518	\$7,418	\$8,531	\$16,551	\$18,988
Wellsford	\$23,706	\$27,262	\$10,193	\$11,722	\$13,512	\$15,538

Figures to the nearest dollar

Source: Watercare, Infrastructure Growth Charge

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Goal 2 scoring overview

Goal	RAG rating	Sector direction
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions		

The water sector has a mixed performance against Goal 2. There is limited monitoring of types of use in the water sector, and a lack of pricing incentives to encourage efficient use of the network. However, the transition from fixed charges to volumetric charges has begun to improve signals. This scoring is informed by the detailed analysis of the water sector against the proposed Pricing Principles that fall under Goal 2:

- 5. Usage behaviour:** Pricing should encourage efficient and appropriate use of the network
- 6. Whole of life costs by type of use:** Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour
- 7. Signalling externalities:** Prices should signal both positive and negative externalities generated by the network and its use
- 8. Appropriate user-funded subsidies:** Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave
- 9. Transparent and reasonable implementation:** Pricing should be developed and implemented in a transparent and reasonable manner

Principle 5

Usage behaviour: Pricing should encourage efficient and appropriate use of the network

The water sector currently has a mixed performance against this principle:

- Volumetric pricing incentivises usage behaviour, such as conservation and leak reduction, but generally does not target times or locations with network constraints.** Case study 14 on volumetric pricing on the next page provides more detail on this.
- Property rate based charges do not incentivise efficient network use.** Fixed annual charges are consistent with whole of life cost recovery but may result in cross-subsidisation as large and small users within a user group (e.g. different household make-ups) pay the same amount.

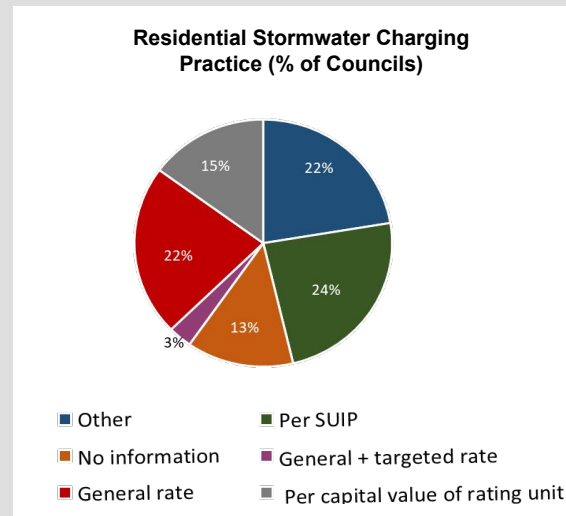
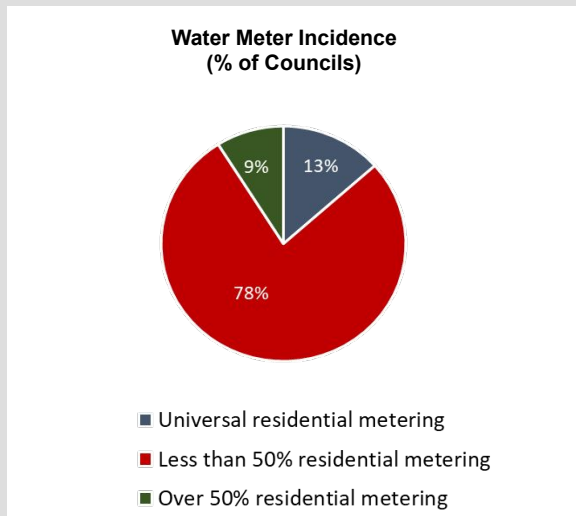
Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Case study 13 - Metered vs unmetered use

There is significant diversity in the water service charging practices of councils, which suggests there is scope to improve consistency of pricing incentives across New Zealand. The two charts below highlight this:

- For water, this depends on availability and use of meters, as illustrated on the left below. Unmetered water connections may be charged per a Separately Used or Inhabited Part (SUIP) charge, or a targeted or general rate.
- Residential stormwater charging practice is also illustrated below, with costs recovered in a similar manner to the non metered water charges.

While residential metering and per SUIP charging enable some signals for use, most councils rely on mechanisms that do not enable these signals (**Principle 5**).



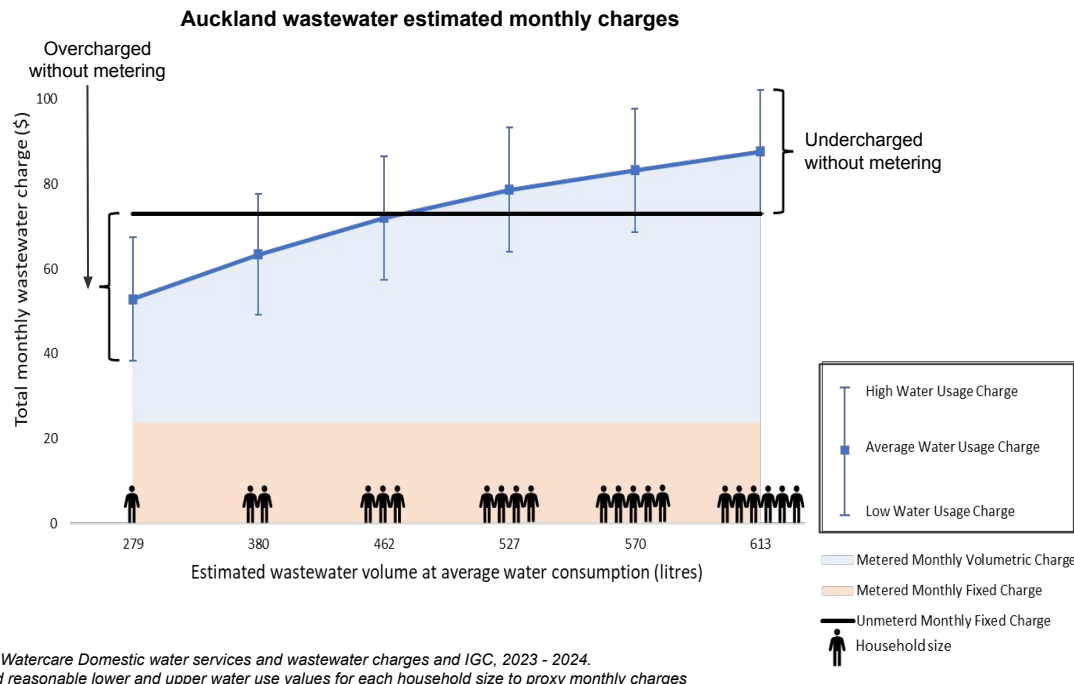
Source: Building Research Association of New Zealand (BRANZ), Residential water tariffs in New Zealand, 2018

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Case study 14 - Impacts of volumetric pricing: metered vs unmetered wastewater

In order to provide volumetric pricing, connections need to be metered. There is not universal metering across the country, which is an immediate barrier to implementing the Pricing Principles supporting Goal 2.

This case study highlights how costs and benefits are aligned for high and low users under different pricing structures using Watercare's residential wastewater tariff options. A two part tariff, based on a unit charge and a monthly charge, is offered to those with meters. The few customers without meters pay a fixed monthly charge. The wastewater volume for each household is estimated from metered water consumption. Under the two part tariff, all households pay the same fixed rate, but low use households pay less overall due to the variable charge, as shown by the blue line to the right. The unmetered monthly fixed charge (the black line) does not reflect the usage of the network and results in cross subsidies by low use households of high use households. **This case study demonstrates how a lack of data (such as from metering) can result in poor alignment with Principle 5.**



Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle 6

Whole of life costs by type of use: Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour

The water sector currently performs well against this principle:

- **Under the Local Government Act, local government is required to recover whole of life costs, including depreciation of past investments, and operating costs.** Investigations by the Auditor General have confirmed that this practice is generally followed by councils. However, as investment needs increase to address new demand, water quality and environmental standards, renewals and maintenance deficits and resilience this principle may become more challenging to meet in the future.
- **Local governments with multiple water schemes** may also recover the costs of each scheme from the users connected to it.

Principle 7

Signalling externalities: Prices should signal both positive and negative externalities generated by the network and its use

The water sector currently has a mixed performance against this principle:

- **There is inconsistency across the water sector in pricing positive and negative externalities.** In particular:
 - There are significant public health and environmental benefits associated with water services and therefore the current structure of ratepayer subsidies of water services, including stormwater services, may be appropriate
 - Environmental impacts are important within the water sector, but are not well reflected in prices
 - Pricing structures may help to signal externalities, e.g. variable pricing is aligned with abstraction, treatment and discharge impact
 - Regulation including resource management consenting requirements for water offtake and discharge is intended to manage environmental impacts.

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle 8

Appropriate user-funded subsidies: Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave

The water sector currently has a mixed performance against this principle:

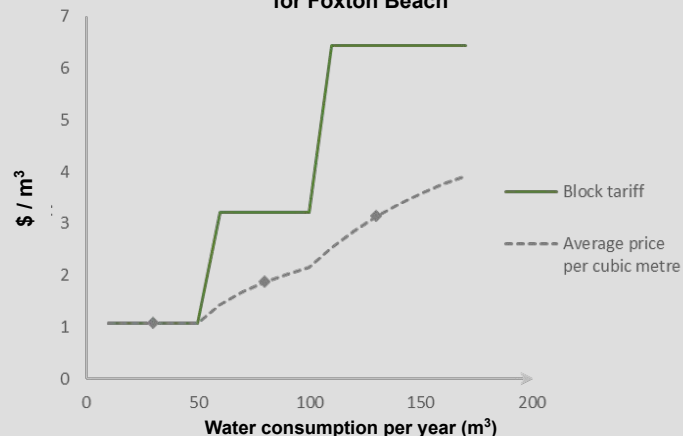
- **Cross-subsidy exists within the water sector, but is not well understood.** This is due to the wide range of funding options employed by local government and council-controlled organisations. Key examples of likely cross-subsidisation in the water sector include:
 - Higher use connections may fund subsidies under volumetric or block charging, while lower use connections may fund subsidies under Uniform Annual Charges
 - Subsidisation between user groups - residential and commercial
 - Those with higher value properties may fund subsidies under property rate based charges
 - The funding sources for transport networks also partly fund stormwater infrastructure, although the funding source is predominantly general or local rates.

Case study 15 illustrates how different block tariffs for water services may create cross subsidies between high and low users.

Case study 15 - Increasing block tariff at Foxton Beach

Horowhenua District Council implements an increasing block tariff for water consumption. The chart below shows the unit price applied to the first 50 cubic metres, and the step increases to prices for incremental use. Those who use more water pay a higher average rate. This is consistent with providing a basic level of service at a more affordable rate. **This is an example of alignment with Principle 8, as less price-sensitive users would consume some water at higher prices, subsidising a lower price for more price-sensitive users at lower usage levels.**

Increasing residential incremental water consumption block tariff for Foxton Beach



Source: Horowhenua District Council, Water Consumption Rates

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle 9

Transparent and reasonable implementation: Pricing should be developed and implemented in a transparent and reasonable manner



The water sector currently has a mixed performance against this principle:

- **Pricing methodologies are not publicly available with the exception of infrastructure growth charges and development contributions.**
However, the transparency of pricing methodologies is expected to change under the current water sector reforms.
- **Water sector prices are typically transparent and understandable.**
Prices and targeted rates are well presented with adequate supporting explanation. The exception is general rates, where it is difficult to understand how much from that source is being used to fund water services.



Goal 3: Pricing should incentivise broadly distributed benefits

Goal 3 scoring overview

Goal	RAG rating	Sector direction
Goal 3 Pricing should incentivise broadly distributed benefits		

The water sector has a mixed performance against Goal 3. Pricing does not significantly influence the distribution of benefits among stakeholders for water services. Water is largely self-funded, supported by ratepayers. Some users choose efficient bypass and to access private schemes which may provide lower service quality at lower cost. This scoring is informed by the detailed analysis of the water sector against the proposed Pricing Principles that fall under Goal 3.

- 10. **Benefits of efficiency gains:** Pricing should provide incentives for suppliers to lower prices as they become more efficient
- 11. **Price-quality trade-offs:** Prices should allow users to make price-quality trade-offs
- 12. **Appropriate publicly-funded subsidies:** Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network, investment in it, or both.

Principle 10

Benefits of efficiency gains: Pricing should provide incentives for suppliers to lower prices as they become more efficient

The water sector currently has a mixed performance against this principle:

- **The Local Government Act prohibits charging in excess of costs.** This means any efficiency gains must be passed to users via lower prices. However, due to the lack of ring fencing of the revenue and costs associated with water services within local government budgets it is difficult to assess how effectively this applies in practice.
- **Affordability concerns incentivise efficient operations, but in practice this may result in deferred investment and maintenance resulting in higher lifetime cost.** Expenditure decisions are heavily influenced by political considerations, which typically involve much shorter time horizons than the lives of the assets.

Goal 3: Pricing should incentivise broadly distributed benefits

Principle 11

Price-quality trade-offs: Prices should allow users to make price-quality trade-offs

The water sector currently has a mixed performance against this principle:

- **Pricing reflects the cost base of the delivery of water services, rather than price-quality trade-offs.** There are high minimum standards for public networks, including for pressure, water quality and wastewater discharge. While water quality is standardised, quality trade-offs exist in network design such as water pressure and security of supply. This is evident in different network configurations for larger and smaller population areas - however pricing reflects the cost base, rather than explicit pricing/service options.
- **There is some access to alternatives for residential customers, who may chose to bypass the public network and self-supply.** Households can (subject to resource consent) install a water tank, and connect it such that water is collected from the property (e.g. the roof), stored, and then piped into the house network and appliances. They can also install a septic tank, to collect wastewater, which can be periodically emptied by a private company.
- **There are more service and cost options available for industrial customers.** While network-wide security of supply cannot be influenced by a single customer, additional local network redundancy can be provided. Water can be provided at a specific pressure and specific service level standards could be arranged. Industrial customers can negotiate customer-specific charging arrangements, including the level of the charges and also the structures.

Principle 12

Appropriate publicly-funded subsidies: Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network or investment in it, and where these benefits would exist even when pricing already aligns with principles 1-11

The water sector currently has a mixed performance against this principle:

- **There are limited public subsidies for the delivery of water services or investment in water infrastructure.** While there are some instances of central government funding to address network failures and delivery upgrades, in general the water sector is largely self-funded by users and local government - through rates, user charges, development contributions and consenting fees.

Key opportunities for improvement in pricing performance

Key opportunities for improvement

The water sector, similar to the land transport sector, has significant scope for improvement in pricing performance. The current system settings emphasise local government ownership and provision of water services, without requiring ring fencing of associated costs and revenue to enable appropriate price setting. Water sector reform may address some of the challenges associated with the current system settings and therefore improved performance against Goals 1, 2 and 3. Reform provides an opportunity to consider the role of pricing within this sector to a greater extent than has been done previously.

The key opportunities for improved pricing performance in the water sector include:

- **Fully funding water services.** Current reforms seek to improve funding and financing of water services, including through more widespread use-based charges.
- **Building an evidence base to inform decision-making.** Pricing practices generally do not reflect investment choices and service quality options. Alongside this, a better understanding of existing cross subsidies between groups of water service users and other stakeholders will help to guide pricing reform.
- **Investing in metering.** The transition away from fixed charges to volumetric charging has begun to improve price signals to users but more investment in metering is required. This is illustrated in case study 16, opposite.
- **Tailoring stormwater funding solutions.** Stormwater services are interconnected with other infrastructure and require tailored funding solutions.

Case study 16 - Peak demand pricing for water

Greater use of volumetric pricing is a key driver to improve outcomes in New Zealand. Even where we have water meters, there is no capability to monitor time of day usage like there is in the energy sector. The demand for water has two peaks during the day, like energy, and currently it is technically infeasible to price for peak demand because of the nature of water meters. Peak use is not as much of an issue in this sector as water can be stored in reservoirs within the network.

However, there is also a seasonal demand pattern, which is weighted to summer use and is driven by activities like irrigation. Warm dry areas like Central Otago generally use around twice as much water per household in the summer as the rest of the country. With standard water metering there is still the opportunity to implement variable pricing to reflect restricted supply at certain times of the year. Seasonal water pricing is implemented in Australia and the US.

The table below contains the different rates charged by Hunter Water in New South Wales. The higher charges during drought periods reflect the shortage of supply across the water network.

Charge type	Annual charge	Variable charge
Water service	\$29.51	-
Water usage non-drought	\$2.89	Per kilolitre registered
Water usage - drought response days	\$3.39	Per kilolitre registered
Sewer service	\$789.18	-

There is also the option of separate metering for irrigation, where the price can be targeted at non-essential use, which in New Zealand is frequently managed by use restrictions and 'hose bans'. Given that New Zealand has many residential properties without meters, it is unlikely that dual metering will be implemented in the near future.

Source: Customer Charges, effective 1 July 2023 - 30 June 2024

A silhouette of a person with short dark hair and glasses, holding a mobile phone to their ear. They are positioned on the left side of the frame, looking out over a landscape at sunset. The sky is a mix of light blue and orange, with the sun's glow visible on the horizon. A semi-transparent white horizontal band is centered across the image, containing the text.

2c. Telco

Current system settings - scope

Telco sector - overview

The telco sector is competitive, meaning pricing outcomes are determined largely by the market. This sets it apart from the other three sectors - land transport, water and energy - as, while there may be competitive segments within these sectors, they are generally guided by regulation and central government policy.

The telco sector is comprised of:

- **Fixed line networks.** Providing physical connections to end customers or connection nodes by cable, through which end users receive phone line, broadband and other data services. Fixed line services are predominantly provided over fibre optic networks, and to a lesser extent copper and cable legacy networks which are gradually being phased out. Fibre Fixed Line Access Services are provided by Chorus and three Local Fibre Companies. Various other providers own and operate both public and private fixed line networks.
- **Wireless networks.** Mobile and other wireless networks use radio waves to connect end users. There are multiple wireless networks used in New Zealand, including the major 3G, 4G and 5G mobile broadband networks (e.g. Spark, One New Zealand, and 2Degrees); local radio networks used for private and public communication (e.g. VHF/UHF marine radio, local mesh radio networks); and satellite based connections (e.g. Starlink).

The competitive nature of the telco sector drives high paced innovation and evolution of improved technologies. Fibre and 5G mobile broadband are recent examples of innovation that allows for much higher bandwidths across fixed and wireless networks, whereas new satellite based networks are providing wireless broadband services to rural and remote areas. The focus of this study is pricing of public fixed and mobile networks.

Telco sector - scope

There are three key components involved in providing connectivity to homes and businesses for fixed line and mobile network services, which form the scope of the current pricing analysis:

1. **Network infrastructure.** This refers to the physical components of telco networks that connect homes and businesses to services, and provides the backbone foundation for how the rest of the telco sector operates. Network infrastructure refers to the passive infrastructure in the telco networks (layers 0-1), which do not actively process or transmit data.
2. **Wholesale market.** This refers to the regulated and commercial wholesale market - in particular, the wholesale services made available by the telco infrastructure owners. The wholesale market plays an important role in shaping outcomes at the retail level for customers. The wholesale market includes the active layer of the network (layers 2 and above), which are the components that process, route and transmit data and communications.
3. **Retail market.** This refers to the retail market for end customers. Retail telco markets are where combinations of network infrastructure and wholesale offers are packaged up by competing retailers to market to customers. The structure of the retail market has the most direct impacts on customer experience. The retail market in New Zealand has been significantly shaped by wholesale market access regulation, the government's ultra-fast broadband initiative, and the three mobile network operators investment in connectivity to homes and businesses.

To provide the foundation for understanding the current pricing analysis, further detail on the current system settings for the telco sector follows. This includes an overview of the sector structure and legislative framework, approach to price setting, pricing structures and key trends.

Current system settings - sector structure and legislative framework (1 of 2)

Below is a high-level overview of the structure and legislative framework that governs and sets the parameters for the telco sector. This is designed to provide the foundation for understanding the role of pricing within the sector. **The following pages provide a more detailed view of how this translates to price setting in the telco sector.**

Infrastructure

Key organisations

- **The Commerce Commission**, responsible for regulation of fibre fixed line access services and legacy copper services and other supplier undertakings.
- **Ministry of Business, Innovation and Employment**, administers the Telecommunications Act and the Commerce Act and is responsible for providing advice to Ministers on the sector.
- **Telco Carriers Forum Code**. Provides for the facilitation of the transfer of telecommunications services in New Zealand.

Legislative framework

- **Telecommunications Act 2001 (Part 2 & 6)**. Provides for regulation of legacy copper and fibre fixed line access services.
- **The Commerce Act 1986 (Part 2)**. Empowers the Commerce Commission to monitor competition and address market power.
- **Undertakings under Part 2A and 4AA of Telecommunications Act 1986**. Supplier undertakings for copper, fibre, & rural broadband.

Wholesale

Key organisations

- **The Commerce Commission**, responsible for regulation of some fibre and legacy wholesale copper products
- **MBIE**, responsible for sector legislation (refer opposite), as well as management of radio spectrum to support wireless applications.
- **Telco Carriers Forum**, responsible for the Telco Carriers Forum code.

Legislative framework

- **Telecommunications Act 2001 (Part 2 & 6)**. Provides for regulation of fibre fixed line access services and legacy copper wholesale inputs.
- **The Commerce Act 1986 (Part 2)**. Empowers the Commerce Commission to monitor competition and address market power.
- **The Radiocommunications Act 1989**. Provides for the tradeable, fixed-term management rights over parts of the radio spectrum
- **Telecommunications (Interception Capability and Security) Act 2013**. Establishes obligations for telecommunications providers to provide interception capability and network security.

Current system settings - sector structure and legislative framework (2 of 2)

Retail

Key organisations

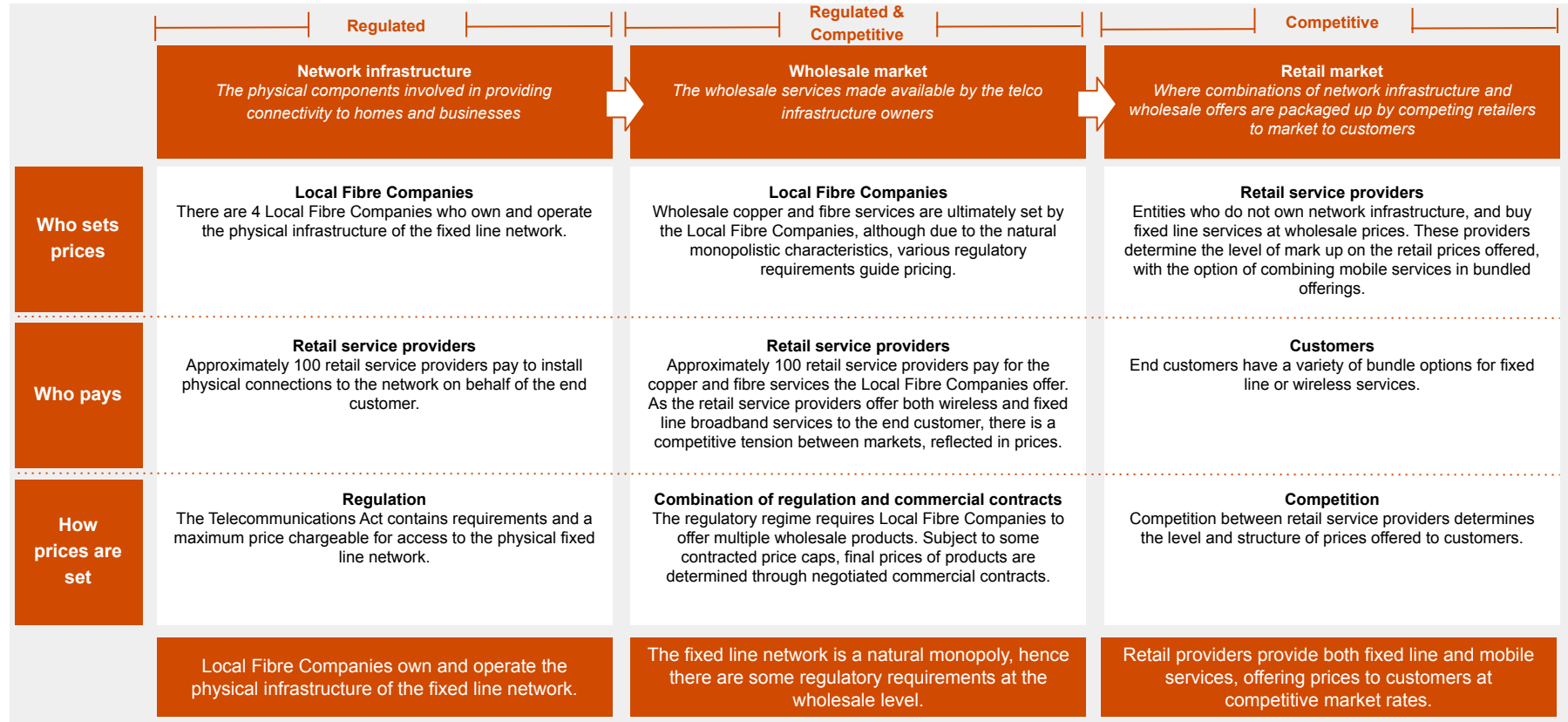
- **The Commerce Commission**, responsible for monitoring of retail competition and fair trading and regulation of number porting, mobile termination and colocation services
- **Telco Carriers Forum**, industry body responsible for developing codes and standards alongside other stakeholders (e.g. number porting)
- **Ministry of Business, Innovation and Employment**, as above.

Legislative framework

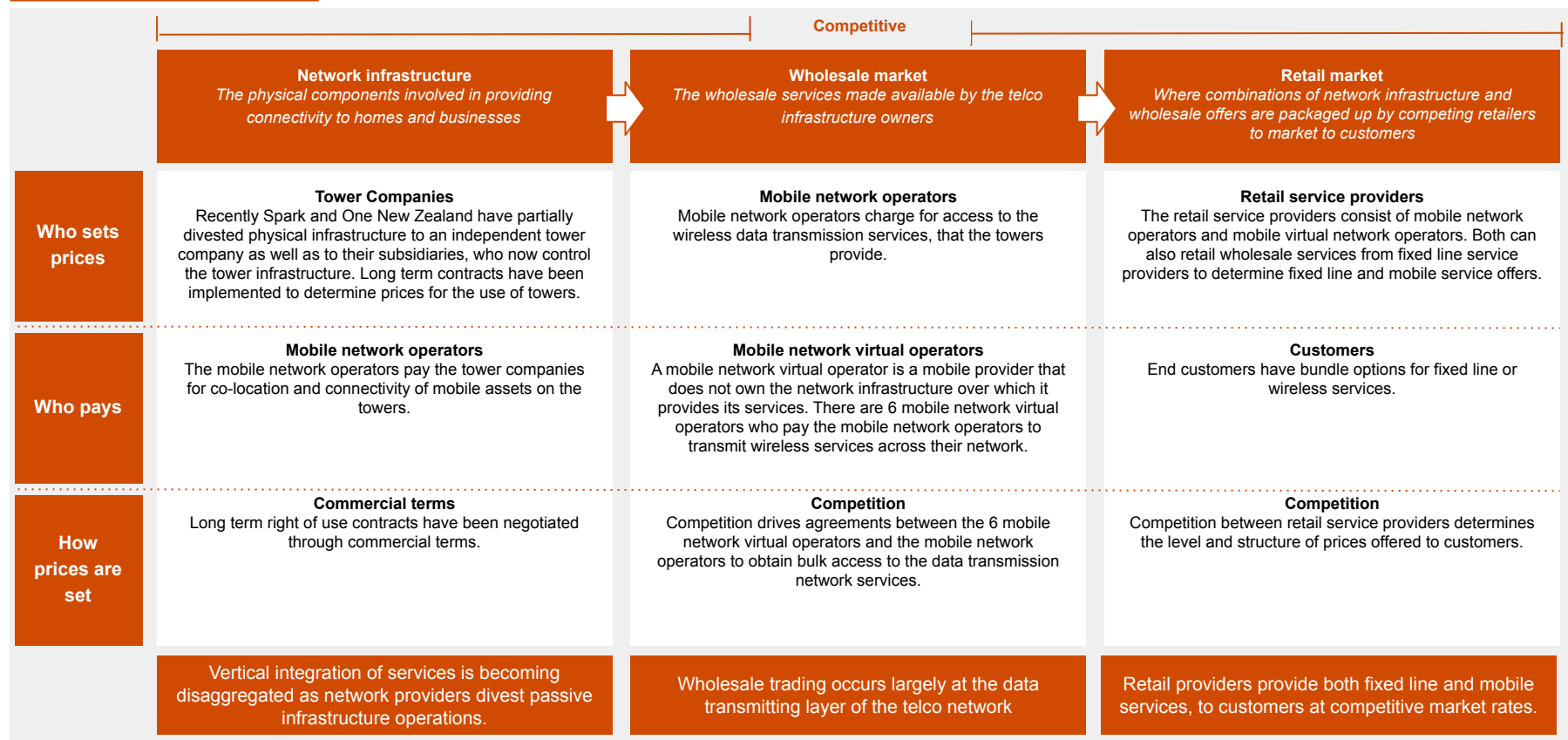
- **Fair Trading Act**, protects customers from misleading and deceptive trader behaviour, and unfair trading practices
- **The Commerce Act 1986 (Part 2)**. Empowers the Commerce Commission to monitor competition and address abuse of market power.
- **Determinations under Telecommunications Act** relevant to retailing include number porting regulations, Mobile Termination Access Services determination, and mobile colocation determination.
- Regulated codes overseen by the Commerce Commission and developed by the Telecommunications Carriers Forum.



Current system settings - approach to price setting in the fixed line network



Current system settings - approach to price setting in the mobile network



Current system settings - common pricing structures

Pricing structure overview

Pricing in the retail segments of the telco sector consists of a combination of fixed and variable pricing:

- **Fixed pricing.** Customers can enter into fixed price contracts, where a set price is paid on a recurring basis for a mobile or data plan. Most commonly, this is a bundle of broadband, mobile and other related services (e.g. Spotify premium discount).
- **Variable pricing.** The evolution of the telco market and bundling of services has reduced reliance on variable prices. In this structure, the customer pays on usage basis for their texts, calling minutes or data. Typically, service levels are restricted instead if bundled offering service levels are used.

The approach and structure of pricing in the telco sector is largely determined by the market due to the competitive nature of the sector. Specifically, retailers determine the structure of their prices to suit customer needs, to maximise their customer base. This has resulted in widespread service bundling - with prices offered to customers for combinations of bundled services.

Wholesale and network charges are typically based on recurring fixed charges for pre-specified data bandwidth services for access services. Fixed charges are also used for point to point links, co-location and space rental, and other data management services. Variable charges can be used for data services per gigabit or for excess usage, but often service levels are reduced where fixed price service thresholds are met.

Time-of-use pricing is not currently available for general customers served by Spark, One NZ, 2degrees or Trustpower (the four largest telco retailers, making up 84% of total market).

The table on the right provides more detail on the pricing structures adopted within the telco sector.

Pricing structure table

Mobile network and fixed line pricing structure		
	Fixed pricing	Variable pricing
Mobile network and broadband (bundled)	<ul style="list-style-type: none">• Recurring pre-pay• Recurring post-paid	<ul style="list-style-type: none">• Variable charge per usage (\$ per unit of use)
Wholesale	<ul style="list-style-type: none">• Recurring charge for wholesale data services (e.g. \$ per gigabit per second)• Data centre co-location and connectivity services (\$ per service)• Backhaul charge (\$ per gigabit per second)	<ul style="list-style-type: none">• Variable data usage (\$ per gigabyte)• Additional or excess use charges per service (\$ per gigabit per second)
Network / Towers	<ul style="list-style-type: none">• Monthly charge (\$ per fixed line connection) by bandwidth category or fibre link• Tower and exchange co-location space rental charge and other connectivity services	<ul style="list-style-type: none">• N/A

Current system settings - emerging trends in the telco sector

In addition to an understanding of the current system settings, emerging trends in the telco sector have been identified to support the current pricing analysis. These trends highlight disaggregation of the sector into core infrastructure and technology and data services as a commodity. **The emerging trends identified are described at a high-level below.**

Supply side trends







- In the last decade, the sector has separated along the lines of core infrastructure assets - fixed line networks, cell towers, and backhaul assets - and technology and customer segments - comprising wholesale, mobile and retail businesses. This change was first unlocked with the Government UFB and RBI initiatives in the early 2010s and has been confirmed by recent private investment decisions.
- This separation is evidence of the allocation of capital to meet different investment risk profiles by the parties most suited to manage these risks. Physical assets are longer term, lower risk investments, requiring less innovation and lower returns, whereas mobile and customers segments carry greater risk.
- The pervasive offerings of “over the top” internet services by global technology companies (e.g. Facebook, Whatsapp etc) has driven local telco providers to focus on base level infrastructure and data services. Where they were once vertically integrated and innovating to technology services, they are now increasingly more a utility focused on provision of base data services.
- Rollout of fibre and rural broadband connections has steadily continued but begun to slow as mobile and satellite technologies become more viable alternatives, particularly in providing service in remote areas.
- The telco sector plays an ever more critical role in the economy and society through providing social and business connectivity, economic platforms, public services and resilience. The Covid-19 pandemic demonstrated this critical role in coordinating responses and maintaining economic activity. This coincided with a surge in demand for data service on the networks.

Demand side trends

- The sector has seen rapid data usage demand growth over the last decade driven by cloud computing, video, gaming, and other high data applications. Demand for network-provided text messages, phone calls, content and other services has been displaced by over the top service providers.
- Customers uptake of mobile broadband services has increased significantly as costs have fallen and as successive mobile technology generations have been rolled out. Most customers have ‘cut the cord’ on traditional fixed phone lines in place of mobile, with many also moving solely onto to wireless based broadband services, foregoing fixed line offerings. Whether this trend becomes widespread will depend on the technological advances in bandwidth expansion for fibre, mobile, and satellite.
- Data aggregators, such as Microsoft and Amazon, have begun to establish more data centres in New Zealand. This increases network demand on core infrastructure, but also improves quality of services as data is hosted locally.
- The Internet-of-Things and machine-to-machine connection are accelerating. This is the next level of innovation by tech firms built on the foundation provided by 5G networks, and is expected to unlock significant economic benefits for the digital economy.
- The Rural Broadband Initiative and satellite broadband (e.g. Starlink) are improving accessibility for remote areas. This is an example of global competition in local markets.
- Affordability of basic telco services has been steadily improving as a side-effect of increases in willingness to pay for more advances services.
- Digital literacy remains a barrier to accessing many benefits of telco services.



Current pricing analysis - telco sector scorecard

The current system settings for the telco sector provide the foundation for understanding the sector's performance against the proposed Pricing Goals and Principles. The scorecard below provides a summary of the telco sector's performance, demonstrating a strong performance against the proposed Pricing Goals. This is largely as a result of natural competition within the sector. The notable exception is that prices do not yet fully reflect whole of life costs for the core network as the sector transitions from price controls to market pricing. **The remainder of this section includes the detailed analysis that informed this scorecard, and the key opportunities identified through this analysis.**

Current pricing analysis scorecard - Telco			
Goal	RAG rating	Sector direction	Rationale
Goal 1 Pricing mechanisms should guide investment decisions			<p>The telco sector is considered to perform well against Goal 1. The following factors informed this assessment:</p> <ul style="list-style-type: none"> • There is natural competition between retail service providers, supported by strong user demand and competing technologies. • Retail service providers have good incentives to consider the trade-offs between technology options for investment. • Investment risk falls on the service providers who can manage that risk. • Some willingness to pay signals are muted by the prevalence of "all-you-can-stream" pricing design. <p>As the telco sector currently performs well against Goal 1, the sector performance is not expected to change significantly.</p>
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions			<p>The telco sector is considered to have mixed performance against Goal 2. The following factors informed this assessment:</p> <ul style="list-style-type: none"> • Private ownership, downstream market competition combined with upstream network monopolies incentivise whole of life cost recovery. • However, network suppliers have not yet fully transitioned to cost-reflective pricing following UFB contract based pricing. • Current fibre pricing does not influence time of use, despite lower quality of service at peak in high-traffic areas. • While prices are not currently adjusted to signal externalities to users, this is not prohibited by the current system settings • Some user-funded cross subsidies exist, some users experience digital poverty and limited access to telco services. • The telco sector is competitive and while pricing information is widely available, pricing methods and margins are not. <p>Pricing approaches will continue to evolve, reflecting changes in technology and service offerings, and better alignment of network prices to costs.</p>
Goal 3 Pricing should incentivise broadly distributed benefits			<p>The telco sector is considered to perform well against Goal 3. The following factors informed this assessment:</p> <ul style="list-style-type: none"> • Competition drives sharing of efficiency gains with users through prices as retail service providers seek to maintain retail margins. • The emerging practice of bundling of utility services (energy and telco) offered by retail service providers allows for efficiency gains. • Competition within the telco sector incentivises differentiated service levels, enabling users to make price-quality trade-offs. • Central government investment is targeted towards high value areas for public benefit. <p>As the telco sector currently performs well against Goal 3, the sector performance is not expected to change significantly.</p>

Goal 1: Pricing mechanisms should guide investment decisions

Goal 1 scoring overview

Goal	RAG rating	Sector direction
Goal 1 Pricing mechanisms should guide investment decisions		

The telco sector is considered to be performing well against Goal 1. Natural competition in the telco market results in pricing signals which promote efficient investment in new technologies and quality of service which is consistent with user demand and allocation of market risk. This scoring is informed by the detailed analysis of the telco sector against the proposed Pricing Principles that fall under Goal 1:

1. **Quality of service:** Pricing should create incentives to improve the quality of service in ways that users want to pay for
2. **Network configuration options:** Pricing should reflect differences in whole of life costs between network configuration options
3. **Level of investment:** Pricing should incentivise a level of investment which balances the associated benefits and costs
4. **Risk allocation:** Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

Principle 1

Quality of service: Pricing should create incentives to improve the quality of service in ways that users want to pay for

The telco sector currently performs well against this principle:

- **The unique characteristic of the telco sector is the natural competition between Retail Service Providers, supported by strong user demand and a range of competing technologies.** This supports increasing the availability of pricing options, and associated signalling to support improvements to quality of service.
- **There are no explicit quality incentives in place for fibre network performance, although there are disincentives for falling below an established standard.** Network performance is subject to disclosure, monitoring and contractual standards.
- **The 'equivalence of inputs' obligations on fibre networks ensures that core network and cable configuration and pricing supports retail competition for downstream services.** This mechanism, regulated by the Commerce Commission, requires that the monopoly portion of the network provides the same quality and price of service to third-party access seekers as it provides to its own downstream operations. While not explicitly aimed at improving quality of service, this is an effective way to harness downstream competition to create upstream incentives for network suppliers.
- **Competition with mobile drives quality performance and investment in infrastructure in most of the network.** Different quality of service is reflected in pricing options (e.g. prices signal speed and capacity of service).

Goal 1: Pricing mechanisms should guide investment decisions

Principle 2

Network configuration options: Pricing should reflect differences in whole of life costs between network configuration options

The telco sector currently performs well against this principle:

- **Competition drives innovation and investment in network technologies.**
For example, the new satellite internet connection technology can provide internet access to more remote areas, which have high costs to serve by fibre cables.
- **The choice of transmission technology, i.e., fibre, mobile, or satellite, and the extent to which these channels overlap are the most significant configuration factors.** Pricing is separate by network type, so the competing technologies cause cost differences between configuration options. These are reflected in prices, assuming each mode is priced to cover costs. The exception is fibre, as discussed in case study 17 and under Goal 2 below.

Principle 3

Level of investment: Pricing should incentivise a level of investment which balances the associated benefits and costs

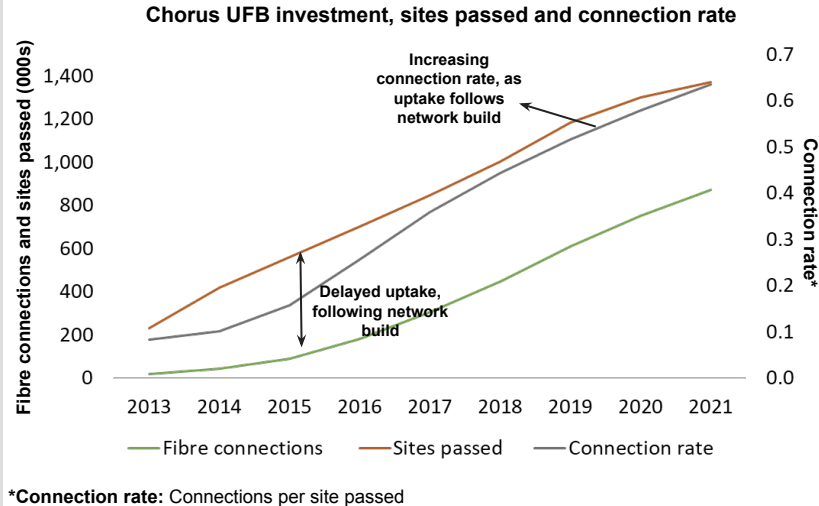
The telco sector currently has a mixed performance against this principle:

- **The risk of entry and competition from other technologies, and user uptake of services incentivises an efficient level of investment, supported by regulation of networks which provides for cost recovery.** Competition and demand is strong, and investment reflects these market dynamics.
- **Some willingness to pay signals are muted** by the prevalence of “all-you-can-stream” pricing design paired with poor transparency around how time of use affects quality.
- **Retail service providers have good incentives to consider the trade-offs between investment options, given the pace of change in technology.**
For example:
 - The fibre build-out was made ahead of demand in most areas following large publicly backed investment in the fibre network. Cost recovery was delayed as average prices did not reflect actual uptake in the early years. This is described in more detail case study 17 on the next page.
 - The rural broadband decision to deploy mobile broadband in remote areas also reflects investment choice. Fibre network owners are extending networks into rural areas through the rural broadband initiative.

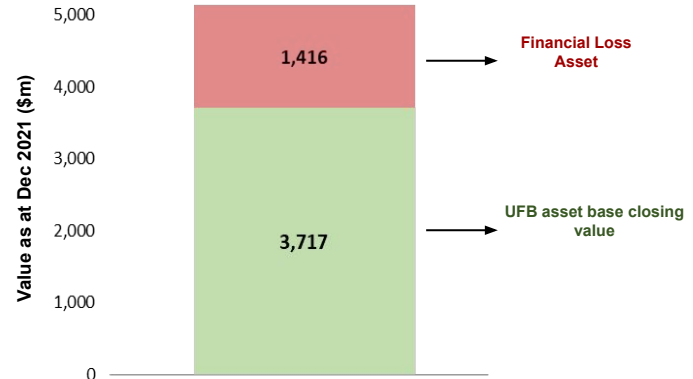
Goal 1: Pricing mechanisms should guide investment decisions

Case study 17 - Investment in fibre ahead of uptake and risk allocation

In the build-out of the fibre-optic broadband network, the government financed a large portion of capital expenditure, effectively subsidising investment well ahead of market demand at the time. For risk allocation, fibre companies faced uncertain long-term demand for the new technology. The benefits of greater access to broadband were widely distributed, and would not have been achievable at the same level without the sharing of the initial investment risk. The fibre companies also shared in that risk by deferring cost recovery until uptake emerged. The financial loss asset, illustrated in the graph on the right below, is the portion of the initial investment by Chorus which was not recovered during the build out, and which will be recovered through pricing from current and future users. **This case study demonstrates alignment with Principle 3 for investing trade-offs, Principle 4 for the allocation of risk and Principle 12 for the appropriate use of public subsidies.**



Chorus Depreciated Asset Base Value and Financial Loss Asset (FLA) as at Dec 2021



Sources:
UFB investment and fibre connection values - Chorus Annual Reports 2013 - 2021; Cumulative sites passed - Chorus Our Fibre Plans Report, 2020; Chorus RAB - Commerce Commission - Chorus' initial regulatory asset base as at 1 January 2022

Goal 1: Pricing mechanisms should guide investment decisions

Principle 4

Risk allocation: Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them



The telco sector currently performs well against this principle:

- **Market competition and regulatory models guide allocation of investment risk.** Prices are set to reflect an appropriate allocation of risk and ensure appropriate incentives for investment in new technology such as ultra-fast broadband. Case study 17 on the previous page provides an example of appropriate risk allocation within the telco sector.
- **Demand risk arising from technological obsolescence is reflected in fibre network pricing.** This currently affects prices only weakly, reflecting the confidence of suppliers that the risk is manageable, for example through the rate of recovery of return of capital (depreciated) over the life of the assets. Telco providers are the right parties to bear this risk as they are in a position to monitor competition and make investments in competing technologies themselves. The original government financing of the UFB networks provided initial protection against demand risk, but this risk resides with the local fibre companies now that the build has been completed, and they seek to recover their costs, net of the financing benefit provided by the Crown.



Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Goal 2 scoring overview

Goal	RAG rating	Sector direction
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions		

The telco sector is considered to be performing well against Goal 2. Natural competition encourages efficient network use as prices are responsive to changes in market dynamics. There are high net public benefits associated with telecommunication services, reflected in some user funded subsidies to promote widespread access. This scoring is informed by the detailed analysis of the telco sector against the proposed Pricing Principles that fall under Goal 2:

5. **Usage behaviour:** Pricing should encourage efficient and appropriate use of the network
6. **Whole of life costs by type of use:** Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour
7. **Signalling externalities:** Prices should signal both positive and negative externalities generated by the network and its use
8. **Appropriate user-funded subsidies:** Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave
9. **Transparent and reasonable implementation:** Pricing should be developed and implemented in a transparent and reasonable manner

Principle 5

Usage behaviour: Pricing should encourage efficient and appropriate use of the network

The telco sector currently has a mixed performance against this principle:

- **Retail pricing is market led and allows for usage-based charging, however current fibre pricing does not influence time of use, and quality of service may be lower at peak times in high-traffic areas.** This may change as user expectations evolve and mobile broadband becomes more competitive. In addition, many telco pricing plans reflect bandwidth. But the cost of providing the service is significantly influenced by network length and connection uptake.

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle 6

Whole of life costs by type of use: Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour

The telco sector currently has mixed performance against this principle:

- **Private ownership and market competition in the telco sector incentivise whole of life cost recovery.** For the monopoly networks, regulation currently permits full cost recovery, net of the benefits of Crown financing.
- **Past unrecovered costs during the transition to fibre are permitted to be reflected in current prices.** During the initial investment period before user demand was sufficient to cover costs, the fibre companies deferred cost recovery to allow attractive pricing for early users. Regulation allowed this loss to be recovered later once demand was strong enough to create market power for the network monopolies. This was permitted through a mechanism called the financial loss asset, described in case study 17.
- **Network monopolies are transitioning to cost-reflective pricing.** While the pricing regime now allows fibre network suppliers to set prices with fewer restrictions, the legacy of contract prices remains in current pricing approaches, for example aligning price changes to inflation or otherwise stopping short of loss-minimising or profit maximising pricing behavior. This is a transition into a new market setting and suppliers have yet to fully embrace cost reflective pricing.

Principle 7

Signalling externalities: Prices should signal both positive and negative externalities generated by the network and its use

The telco sector currently performs well against this principle:

- **While currently prices are not adjusted to signal externalities to users, this is not prohibited by the current system settings.** Positive and negative externalities of the telecommunications sector are large and difficult to measure, but considered net-positive. They are difficult to distinguish from net consumer surplus as almost everyone is a user.
- **The loss-making prices enabled by government support during the early rollout period for the fibre network can be considered an adjustment for positive externalities.** In this case, the externality is the benefit to later users and the public of the network scale achieved at a loss during the rollout phase.
- **Telco congestion is typically managed by limiting use through fair usage policies, rather than through peak demand pricing.** Fair usage policies ensure equitable access for users, and include data use limits and control mechanisms such as traffic management to prioritise certain uses, and reducing internet speed when users exceed data limits (throttling).

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle

8

Appropriate user-funded subsidies: Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave

The telco sector currently has a mixed performance against this principle:

- **Some user-funded cross subsidies exist in the telco sector, including through the Telecommunications Development Levy.** The Telecommunications Development Levy is a small user funded subsidy supporting affordable access to rural broadband infrastructure, services for hearing impaired users and support for 111 services. Each provider pays the Telecommunications Development Levy, the costs of which are recovered from telco users. Funds are allocated to selected providers to subsidise specific services. As these providers implement the subsidy, pricing distortions are minimised, and the subsidy is aligned with network pricing.
- **Some retailers offer subsidised plans for low-income users.** Skinny Jump offers subsidised broadband plans for households who can't access broadband due to cost. In FY22, 23,000 eligible households used Skinny Jump including those at risk of digital poverty due to affordability issues such as seniors, job seekers, disabled people, families with children, those in social housing, refugees and migrants.

Principle

9



Transparent and reasonable implementation: Pricing should be developed and implemented in a transparent and reasonable manner

The telco sector currently has a mixed performance against this principle:

- **Fibre networks face mandatory disclosure of information on pricing and elements of cost-recovery through regulation.** This does not include mandatory disclosure of pricing methodologies other than disclosure to the Commerce Commission of the Equivalence of Inputs (including pricing) obligations for Layer 1 services.
- **The rest of the telco sector is competitive and while pricing information is widely available, pricing methods and margins are not.** Pricing options are generally targeted to user needs, ie: unlimited use vs capped use, but industry terminology and invoicing practices can be overly technical. Plain english guides are available to help users make choices about product and pricing options.

Goal 3: Pricing should incentivise broadly distributed benefits

Goal 3 scoring overview

Goal	RAG rating	Sector direction
Goal 3 Pricing should incentivise broadly distributed benefits		

The telco sector is considered to be performing well against Goal 3. Public backed fibre build out has generated broad net benefits, including targeted investment to support social service access. Competition drives good outcomes for most stakeholders, by incentivising efficiencies and price and service options for users across the competing technologies. This scoring is informed by the detailed analysis of the telco sector against the proposed Pricing Principles that fall under Goal 3:

10. **Benefits of efficiency gains:** Pricing should provide incentives for suppliers to lower prices as they become more efficient
11. **Price-quality trade-offs:** Prices should allow users to make price-quality trade-offs
12. **Appropriate publicly-funded subsidies:** Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network, investment in it, or both.

Principle 10

Benefits of efficiency gains: Pricing should provide incentives for suppliers to lower prices as they become more efficient

The telco sector currently performs well against this principle:

- **Competition drives the sharing of the benefits of efficiency gains with users through prices as retail service providers seek to maintain retail margins.** Regulation of Chorus provides incentives for expenditure efficiencies which are passed on through fibre network prices. Other networks are benchmarked with Chorus and price accordingly.
- **The practice of bundling of utility services (energy and telco) offered by retail service providers allows for potential efficiency gains.** Combining services allows for potential efficiency gains, but also gives a well-established platform for transparency and consolidation of customer prices making it easier to make service and plan decisions. The Commerce Commission is concerned about the comparability of bundled offers and is considering additional disclosure obligations on retailers in this respect.

Goal 3: Pricing should incentivise broadly distributed benefits

Principle 11

Price-quality trade-offs: Prices should allow users to make price-quality trade-offs

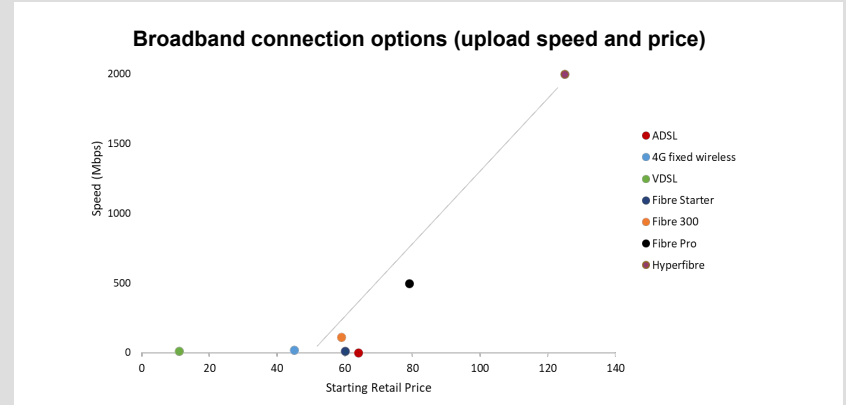
The telco sector currently performs well against this principle:

- **Competition within the telco sector incentivises differentiated service levels, enabling users to make price-quality trade-offs.** This is evidenced by the range of subscription products and services available. Broadband satellite also strengthens offerings to rural areas. Case study 18 provides an example of price-quality trade offs within the telco sector.
- **Prices for most telco services are set by competitive market interactions, allowing benefits to be shared among users and providers.** For example, high end products are initially priced at a premium, then over time they become the baseline product. Technological benefits are shared over time via product development as the technology is disseminated.

Case study 18 - Price-quality trade-offs in broadband

Broadband users have a number of connection options for different levels of service, with a range of prices (noting not all services are available in all locations). Users are able to choose the level of service they require and can afford. Higher priced connection services offer higher average download speeds, which reduces latency, and increases service reliability such as streaming performance.

The chart below shows a range of connection plans using copper, fibre or 5G technologies - this information is available to users. Currently approximately 13% of New Zealand does not have access to the fibre network and therefore rural users have fewer options available to them. **This case study demonstrates alignment with Principle 11, as it demonstrates how telco prices enable users to make price-quality trade-offs.**



Source: Chorus study based on Measuring Broadband New Zealand (MBNZ)

Goal 3: Pricing should incentivise broadly distributed benefits

Principle 12

Appropriate publicly-funded subsidies: Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network or investment in it, and where these benefits would exist even when pricing already aligns with principles 1-11

The telco sector currently performs well against this principle:

- **Central government investment is targeted towards high value areas for the public.** The large public backed financing of the fibre network build out has generated broad net benefits due to widespread access to this critical service. There was also targeted investment in fibre infrastructure for schools, libraries, and other social infrastructure supported by government funding. This public support for telecommunications connectivity across New Zealand continues with the rural broadband initiative, mobile blackspot fund, rural capacity upgrade programme, marae digital connectivity programme and the remote users scheme.
- **The Rural Broadband Initiative is extending rural fibre services to improve both service quality and pricing options.** The take up of the service options on the existing network helps inform the service requirements for the rural network. Case study 19 shows areas in the South Island with access to fibre. Fibre access is concentrated to urban areas, hence the initiative to expand the network to rural areas.
- **Further publicly-funded subsidies may be warranted to address those facing digital poverty reflect affordability challenges or limited options for connectivity.** In 2022, the Commerce Commission found that there is considerable variation across New Zealand in the affordability of fibre broadband, ranging from 1.1% to 1.8% of average net household income for basis fibre plans.

Case study 19 - Fibre availability in the South Island

The map below provides an overview of fibre availability in the South Island, demonstrating that this is currently concentrated in urban areas.



Source: Broadband Map NZ

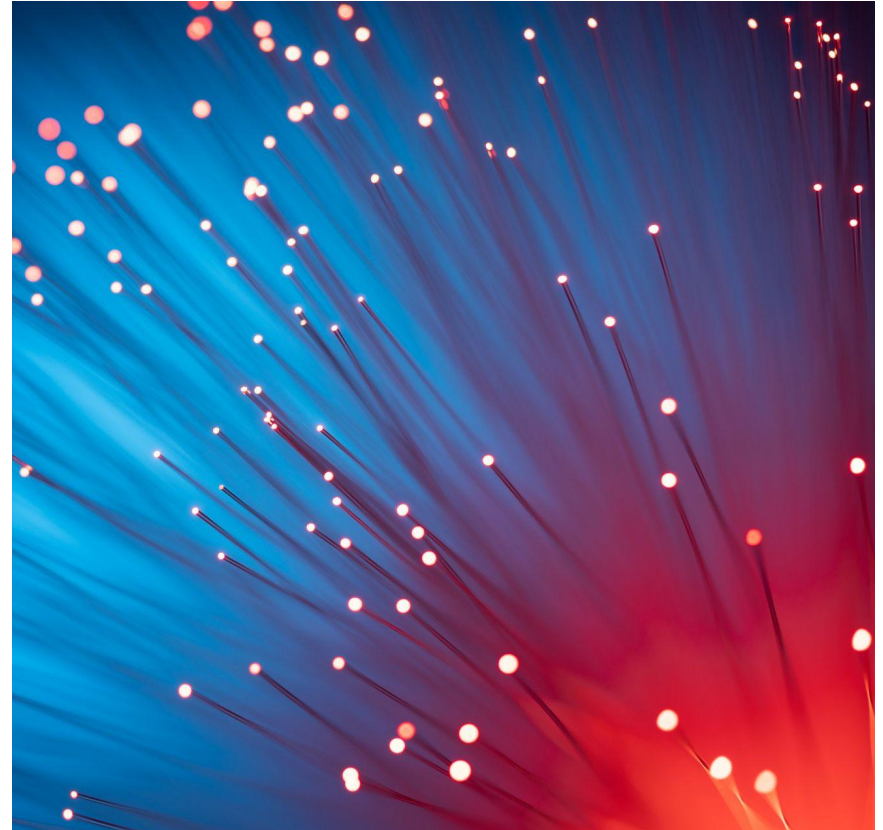
Telco - key opportunities for improvement

Key opportunities for improvement

The telco sector performs well against the proposed Pricing Goals and Principles, as a result of the natural competition within the sector - which is supported by regulation where appropriate. The key opportunities are where the existing strong foundation can be built on to drive pricing performance and maturity. This will have benefits for the telco sector against Goal 2 in particular and for improved performance in other sectors over time.

The key opportunities for improved pricing performance in the telco sector include:

- **Improving equity.** Pricing could evolve to improve services for user groups experiencing digital poverty or with limited access to services, which would likely improve net public benefits.
- **Evolving network pricing.** Network pricing could evolve to better match costs, benefits and service levels. Fibre network suppliers have an opportunity to develop more capability in price setting following the transition away from price controls. This would require greater capability in monitoring what the market can bear alongside the risk of stranded assets as technology evolves.
- **Retail pricing sophistication.** Retail pricing approaches miss an opportunity to apply more sophisticated pricing for congestion at peak times. This mutes signals both for users on the costs of usage patterns, and for suppliers on user willingness to pay for greater capacity at peak.
- **Managing risks.** While public financing supported the investment in fibre ahead of demand, technology risk remains. Regulation of prices will need to adapt accordingly, including potentially removing regulatory constraints if user uptake of fibre starts to decline due to other technologies.





2d. Energy

Current system settings - scope

Energy sector - overview

The energy sector is comprised of both competitive and monopoly segments, and is majority funded through pricing rather than other forms of funding and investment. Systematic vertical separation of the sector was implemented along with regulatory frameworks that distinguish between the competitive (generation and retail) and non-competitive (transmission and distribution) components of the sector. **The current pricing analysis focuses on the non-competitive parts of the energy sector, as they must set prices rather than have a market determine them. This report considers both the electricity and gas sub-sectors that form the energy sector:**

- **Electricity.** Electricity is a nearly universal source of energy to users in New Zealand. A majority (c.82%) of New Zealand's electricity is generated through renewable energy sources - such as hydropower, geothermal power and wind energy.
- **Gas.** Natural gas provides an additional option of networked energy in the North Island, with up to 500 terajoules of energy used from gas each day - about a third of which is used to generate or co-generate electricity. The other two thirds is used primarily by large industrial and commercial gas customers.

To provide the foundation for understanding the current pricing analysis, the following pages provide a high-level overview of the current system settings for the energy sector. This is an overview of sector structure and legislative frameworks, approach to price setting, pricing structures and key trends.

Energy sector - scope

There are four key components involved in supplying homes and businesses with electricity and gas, which form the scope of the current pricing analysis:

- **Wholesale market:** this includes the generation and transmission of electricity and gas, as follows:
 1. **Generation/Production.** This refers to the generation of electricity and the production of gas for sale into the respective markets. There are a number of generators and gas producers in the energy sector in New Zealand, enabling a competitive market.
 2. **Transmission.** This refers to the transportation of electricity and gas from the place of generation or production to the local network or direct-connect users (large industrial customers). In both electricity and gas, this is non-competitive and pricing is supported by regulation.
- **Retail market:** this includes the distribution and sale of electricity and gas to homes and businesses, as follows:
 3. **Distribution.** This refers to the local distribution of electricity and gas to homes and businesses where it is consumed. In both electricity and gas, this is non-competitive and pricing is supported by regulation.
 4. **Retail.** This refers to the sale of electricity and gas to residential and business customers. There is a range of retailers in the energy sector in New Zealand, enabling competition.

Current system settings - sector structure and legislative framework

Below is a high-level overview of the structure and legislative framework that governs and sets the parameters for the energy sector. This is designed to provide the foundation for understanding the role of pricing within the sector. **The next page provides a more detailed view of how this translates to price setting in the energy sector.**

Electricity

Key organisations

- **The Electricity Authority**, responsible for regulating the electricity market (including pricing).
- **The Commerce Commission**, responsible for the economic regulation of electricity transmission and distribution businesses (including setting revenue and quality standards).
- **Ministry of Business Innovation and Employment**, administers the Electricity Industry Act and the Commerce Act and is responsible for providing advice to Ministers on sector performance, policies and investment.

Legislative framework

- **The Electricity Industry Act 2010**. Provides the framework for the regulation of the electricity industry and establishes the role of the Electricity Authority. **The Electricity Participation Code 2010** is the set of rules that govern nearly every aspect of the electricity market, including pricing - set by the Electricity Authority in accordance with the Electricity Industry Act.
- **The Commerce Act 1986**. Part 4 of the Commerce Act covers economic regulation of all electricity distribution businesses, designed to promote outcomes that are consistent with those produced in competitive markets.

Gas

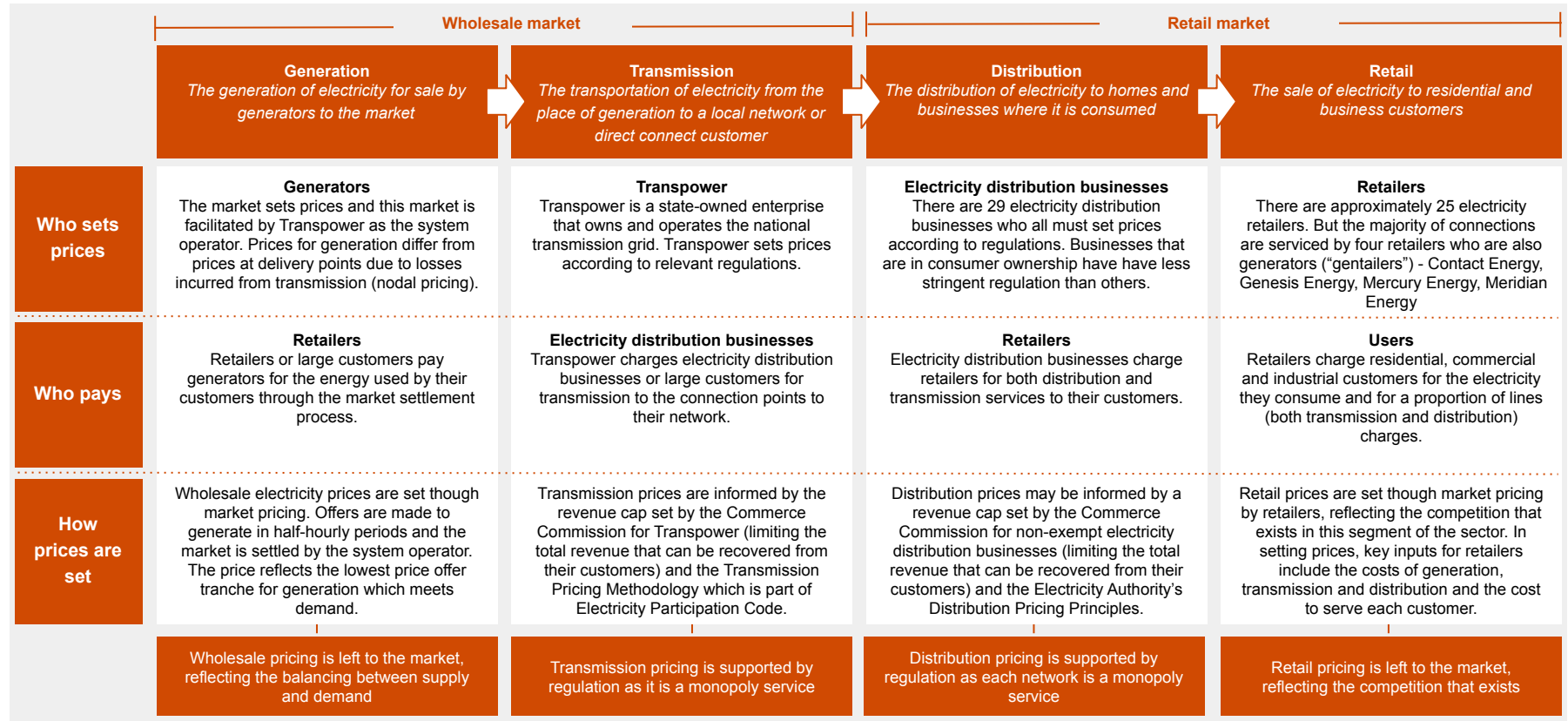
Key organisations

- **The Gas Industry Company**, responsible for market governance and regulation of gas, with the objective of maintaining downward pressure on delivered gas prices.
- **The Commerce Commission**, responsible for the economic regulation of gas transmission and distribution businesses in a similar way to electricity but has a role in pricing (unlike electricity).
- **Ministry of Business Innovation and Employment**, administers the Gas Act and the Commerce Act and is responsible for providing advice to Ministers on sector performance, policies and investment.

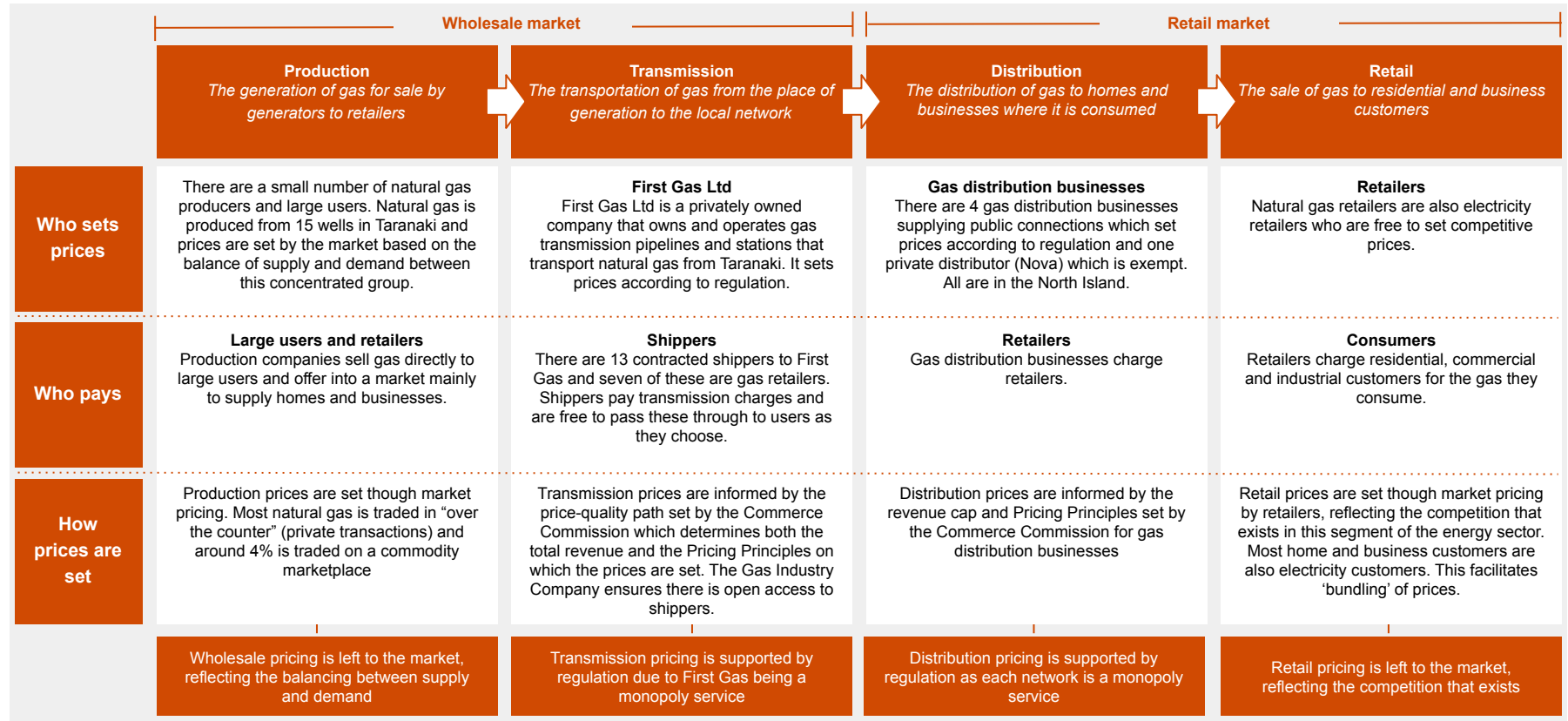
Legislative framework

- **The Gas Act 1992**. Provides for the regulation, supply, and use of gas, and the regulation of the gas industry.
- **The Commerce Act 1986**. Part 4 of the Commerce Act covers all gas transmission and distribution businesses. Part 4's purpose is to promote outcomes that are consistent with those produced in competitive markets. This covers regulated disclosure of prices and pricing methodologies.

Current system settings - approach to price setting in electricity



Current system settings - approach to price setting in gas



Current system settings - pricing structures

Pricing structure overview

Pricing in the energy sector - for both electricity and gas - is made up of a combination of fixed and variable pricing:

- **Fixed pricing.** The fixed pricing component may cover the fixed costs of maintaining electricity and gas supply to the user regardless of level of use. Fixed charges are usually set as a daily charge but other fixed charges may be set for industrial customers, such as capacity charges. Regulation requiring a low fixed charge for residential low users is being phased out. This only applied to electricity users but retailers have voluntarily applied this to gas as well.
- **Variable pricing.** Variable pricing is based on usage and may reflect the impact of use. Variable pricing structures and settings vary significantly across networks depending on the network configuration, the customer base, whether the customer offers a demand response (controlled/uncontrolled), meter-types (e.g. smart), demand profiles, and level of maturity in pricing methodology, as well as the impact of regulation on fixed charges.
- **Peak demand pricing.** Peak demand pricing is utilised in the electricity sector. The gas transmission sector uses capacity reservation pricing, with overrun charges where actual use exceeds nominated capacity which is a form of peak pricing.

Effective electricity pricing requires achieving the right balance between the fixed and variable components.

The bulk of gas supply is to large industrials connected to transmission and therefore in spite of the network and regulatory similarities to electricity, the operation and pricing is substantially different. There is less complexity in the mass market pricing of gas, because customers can substitute other energy sources for gas.

The tables on the next page provide more detail on the pricing structures adopted within the energy sector.



Current system settings - common pricing structures

Electricity

Distribution including transmission		Retail	
Fixed	Variable	Fixed	Variable
Residential <ul style="list-style-type: none"> Low user daily charge (\$/day) Standard daily charge (\$/day) Connection charge (\$) 	<ul style="list-style-type: none"> Volumetric charge (c/kWh) <ul style="list-style-type: none"> Anytime Time of Use Controlled/uncontrolled 	<ul style="list-style-type: none"> Low user daily (\$/day) Standard daily (\$/day) 	<ul style="list-style-type: none"> Volumetric charge (c/kWh) <ul style="list-style-type: none"> Anytime Time of Use Controlled/uncontrolled rate Injection rate (c/kWh)
Commercial <ul style="list-style-type: none"> Standard daily charge (\$/day) Capacity charge (\$/kVA) Connection charge (\$) 	<ul style="list-style-type: none"> Volumetric charge (c/kWh) <ul style="list-style-type: none"> Anytime Time of Use Controlled/uncontrolled Interruptible load Demand charge (\$/MW) 	<ul style="list-style-type: none"> Standard daily (\$/day) Capacity charge (\$/kVA) 	<ul style="list-style-type: none"> Volumetric charge (c/kWh) <ul style="list-style-type: none"> Anytime Time of Use Controlled/uncontrolled Injection rate (c/kWh)
Industrial <ul style="list-style-type: none"> Daily charge (\$/day) Capacity charge (\$/kVA) Connection charge (\$) 	<ul style="list-style-type: none"> Volumetric charge (c/kWh) <ul style="list-style-type: none"> Anytime Time of Use Interruptible load Demand charge (\$/MW) 	<ul style="list-style-type: none"> Daily charge (\$/day) Capacity charge (\$/kVA) 	<ul style="list-style-type: none"> Volumetric charge (c/kWh) <ul style="list-style-type: none"> Anytime Time of Use Injection payment (c/kWh)

Gas

Transmission		Distribution		Retail	
Variable	Fixed	Variable	Fixed	Variable	Fixed
Residential <ul style="list-style-type: none"> Volumetric charge (\$/GJ) 		<ul style="list-style-type: none"> Standard daily (\$/day) Connection charge (\$) 	<ul style="list-style-type: none"> Volumetric charge (\$/GJ) 	<ul style="list-style-type: none"> Standard daily (\$/day) Volumetric charge (c/kWh) 	
Commercial <ul style="list-style-type: none"> Volumetric charge (\$/GJ) 		<ul style="list-style-type: none"> Standard daily (\$/day) Connection charge (\$) 	<ul style="list-style-type: none"> Volumetric charge (\$/GJ) 	<ul style="list-style-type: none"> Standard daily (\$/day) Volumetric charge (c/kWh) 	
Industrial <ul style="list-style-type: none"> Throughput charge (\$/GJ) Capacity reservation fee (\$/GJ/max daily quantity) 	<ul style="list-style-type: none"> Daily (\$/day) Connection charge (\$) 	<ul style="list-style-type: none"> Volumetric charge (\$/GJ) 			

Injection rate/payment = compensation for electricity generated by an individual/entity that is exported to the electricity system

Key

kWh	Kilowatt hours	kVa	Kilo-volt-amperes	MW	Megawatts
c	Cents	GJ	Gigajoules		

Current system settings - emerging trends in the energy sector

In addition to the current system settings, emerging trends in the energy sector have been identified to support the current pricing analysis. These trends highlight the opportunities and challenges facing the energy sector - largely driven by the ongoing energy transition placing increased emphasis on managing the competing objectives of the energy trilemma - sustainability, security and affordability - while decarbonising the energy system. **A high-level description of the emerging trends is set out below.**

Electricity trends







- **Reform of distribution pricing.** The Electricity Authority is continuing with reform of distribution pricing to support: more efficient pricing; better investment in and use of distribution networks; appropriate price signals to consumers as they consider investing in their own distributed energy resources; and an efficient transition to a low-emissions economy. Annual scorecards for each distributor are prepared by the regulator to highlight progress and areas for improvement.
- **Improved signalling.** Technology developments mean that signals about use of networks will become more available and useable for short and long-term decisions. This may allow an increased level of efficiency in network operation without the need for upgrading the physical assets.
- **Cost reductions in batteries and solar panels.** This may facilitate increasing levels of efficient network bypass ("going off-grid")
- **Peak use of the network is increasing at a faster rate than overall use.** This is a particular issue for variable pricing as peak demand is the main driver of investment in capacity upgrades. Some of this increase has been attributed to the removal of the Regional Coincident Peak Demand charge in transmission pricing. Another contributing factor is increased electric vehicle uptake. As a result, there is a focus on encouraging demand side response to reduce demand at peak times, due to load shifting, interruptible load, grid scale and customer storage and energy efficiency.

Gas trends

- **The energy transition.** This creates uncertainty for the future of natural gas, with its production and use already in decline, however the rate of future decline is not clear. The forthcoming Gas Transition Plan is intended to provide some certainty on the pathway for gas. The role of gas in providing security of supply in electricity is a key issue for the energy sector.
- **Price-quality paths for gas pipeline business.** The Commerce Commission determined updated price-quality paths for gas pipeline business in 2022. These were designed to: accelerate capital cost recovery; limit expenditure to reflect the future transition away from natural gas while allowing for short-term growth and sufficient funds to adequately maintain networks; and recognise the uncertain future of gas. This has increased prices in the short term as recovery of capital has been brought forward. The risk for prices going forward is that a large amount of revenue may need to be recovered from a small number of customers, if customers transition away from gas significantly.
- **A non-network alternative is available for natural gas (bottled LPG) and electricity is also a natural competitor for gas.** These two factors suggest gas networks may face sufficient competition to not require price regulation.



Energy sector scorecard

The current system settings for the energy sector provide the foundation for understanding the energy sector's performance against the proposed Pricing Goals and Principles. The scorecard below provides a summary of the energy sectors performance, demonstrating that the sector is performing well against a majority of the proposed Pricing Goals - with scope for improved performance due to increasing flexibility to respond to the fast pace of change in the sector, better use of data and non-wire solutions, and increasing maturity in applying Pricing Principles. **The remainder of this section includes the detailed analysis that informed this scorecard, and the key opportunities identified through this analysis.**

Current pricing analysis scorecard - Energy			
Goal	RAG rating	Sector direction	Rationale
Goal 1 Pricing mechanisms should guide investment decisions			<p>The energy sector is considered to perform well against Goal 1. The following factors informed this assessment:</p> <ul style="list-style-type: none"> Financial incentives for quality performance are passed through into prices by some electricity networks. Regulation provides incentives for service quality for some networks, such as minimum standards, or penalties and rewards for service levels, which are set to maintain service performance consistent with customer expectations. Network configuration is designed to reflect load criticality and size of load. Signals of cost differences are achieved through time of use prices which reflect demand profiles and nodal prices which reflect demand location. Current system settings enable investment to meet demand or where the expected net benefits to users are positive. Regulation enables the allocation of risks between investors and users, subject to willingness to pay. <p>Current practice will continue to improve as the energy transition accelerates given the scale of investment and criticality of the energy system.</p>
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions			<p>The energy sector is considered to have a mixed performance against Goal 2. The following factors informed this assessment:</p> <ul style="list-style-type: none"> Pricing methodologies are designed to recover fixed costs and signal avoidable costs for each customer group. Load control and interruptible load respond to price signals to reduce demand at peak times, avoiding or deferring investment in additional capacity. Retail tariffs which reward demand side flexibility are emerging. Distortionary user subsidies still exist but low user pricing regulations are being phased out. Pricing transparency is mandatory through a well-developed disclosure scheme, which applies for all electricity and gas networks. Some network pricing signals are lost through retail pricing structures. <p>Pricing practices have improved but there is opportunity for more refinement and better outcomes and options for users.</p>
Goal 3 Pricing should incentivise broadly distributed benefits			<p>The energy sector is considered to perform well against Goal 3. The following factors informed this assessment:</p> <ul style="list-style-type: none"> Regulation in the energy sector is designed to distribute efficiency gains and benefits among different users, and incentivises networks to become more efficient as revenues and expenditure allowances are capped There are price-quality trade-offs reflected in prices and this is expected to increase as pricing evolves Central government is investing to support decarbonisation through the Government Investment in Decarbonising Industry fund. <p>Improvement in achieving Goal 3 is expected to follow improvements in achieving Goals 1 and 2.</p>

Goal 1: Pricing mechanisms should guide investment decisions

Goal 1 scoring overview

Goal	RAG rating	Sector direction
Goal 1 Pricing mechanisms should guide investment decisions		

The energy sector is considered to be performing well against Goal 1. The energy transition is making some investments riskier, while opening opportunities for investment in new technologies. Regulation largely drives incentives to invest and risk allocation, allowing suppliers to pass on costs through revenue recovery. Network pricing is evolving towards more cost reflective pricing. This scoring is informed by the detailed analysis of the energy sector against the proposed Pricing Principles that fall under Goal 1:

1. **Quality of service:** Pricing should create incentives to improve the quality of service in ways that users want to pay for
2. **Network configuration options:** Pricing should reflect differences in whole of life costs between network configuration options
3. **Level of investment:** Pricing should incentivise a level of investment which balances the associated benefits and costs
4. **Risk allocation:** Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

Principle 1

Quality of service: Pricing should create incentives to improve the quality of service in ways that users want to pay for

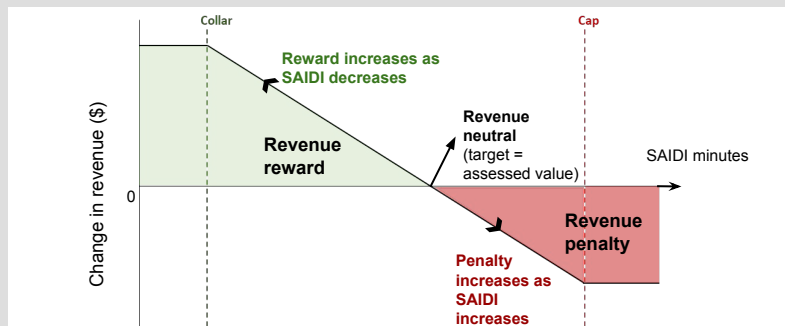
The energy sector currently has a mixed performance against this principle:

- **Energy sector regulation provides incentives for service quality, such as minimum standards, penalties and rewards for variance in service targets, which are set to maintain service performance consistent with customer expectations.** Case study 20 overleaf illustrates quality incentives through prices. These incentives only apply to those electricity networks which are not consumer owned.
- **Financial incentives for quality performance are passed through into prices by electricity transmission and distribution networks.** Regulation incentivises performance improvements and penalises performance degradation with financial rewards or penalties which are passed onto customers through prices. The value of lost load, a measure of customer willingness to pay for reliability, is used to derive the incentive rates for each network. Gas networks and consumer owned electricity networks do not have the same financial incentive regime.
- **Some service levels are explicitly differentiated through prices, providing customer choice.** Examples include pricing discounts for controlled or interruptible load, where networks use demand side responses to address network constraints. Customers who choose to participate are rewarded with lower prices. Those who do not, pay more for uninterrupted service.

Goal 1: Pricing mechanisms should guide investment decisions

Case study 20 - Regulated quality incentive scheme

The regulated quality incentive scheme for some electricity networks rewards customers when network reliability falls below target levels, and rewards electricity distribution businesses when it is above target levels. The financial rewards are capped at two percent of the annual regulated revenue of the electricity distribution business and are applied as a revenue adjustment, which flows through to network prices. **This is aligned with Principle 1 as the pricing regime creates incentives for the supplier to maintain or improve quality of service as well as Principle 3 as the revenue neutral point is a good example of where the costs and benefits align.**



Source: Commerce Commission

Key definitions:

SAIDI: System Average Interruption Duration Index

Cap: maximum value for interruptions subject to financial incentive

Collar: minimum value for interruptions subject to financial incentive

Assessed Value: the actual SAIDI value in the year

Principle 2

Network configuration options: Pricing should reflect differences in whole of life costs between network configuration options

The energy sector currently has a mixed performance against this principle:

- **Network configuration is designed to reflect load criticality and size of the load, with signals of cost differences achieved through time of use prices for timing issues and nodal prices for locational issues.** For example, Transpower tests options for grid investments. The increasing complexity of the sector, and climate change risk mean that non-network options are tested, for example embedded generation to support reliability in remote areas. The embedded generation may be compensated for providing this service. Time of use pricing is relatively new for electricity networks, and is not currently widely passed on to residential and small commercial users.
- **In the wholesale electricity market, the energy price reflects the grid constraints and can be a useful signal for grid investment.** In particular, nodal pricing is a mechanism that charges location-based marginal prices according to the cost of increasing offtake at a specific node in the grid. Higher nodal prices reflect areas with higher demand relative to available supply, which indicates where to direct investment either in new grid assets or new supply.
- **Network prices recover whole of life costs from multiple customers.** The costs and service levels associated with different network configurations, for example the level of redundancy in the local or regional network, may not be reflected in network wide prices, because they are not location specific.

Goal 1: Pricing mechanisms should guide investment decisions

Principle 3

Level of investment: Pricing should incentivise a level of investment which balances the associated benefits and costs

The energy sector currently performs well against this principle:

- **The level of network investment is regulated by economic regulation administered by the Commerce Commission.** This includes disclosure and approval of investment plans and allowances.
- **Pricing is influenced by regulated pricing principles** to reflect economic costs and specific investment challenges.
- **Current system settings enable investment to be directed towards areas with higher levels of demand or where the expected net benefits to users are positive.** For example, the transmission pricing methodology uses a market benefit approach to determine the beneficiaries of grid investments.
- **Network pricing is evolving towards more cost reflective pricing.** Legacy two part pricing (anytime variable/fixed) is being transitioned out by electricity distributors in response to regulatory changes, access to smart meter data and in response to changing customer demands. Higher peak period pricing reflects the costs of providing additional network capacity where networks are constrained, and off peak pricing signals low network costs to encourage users to shift demand, eg: for electric vehicle charging. Rebalancing towards fixed charges also reflects the largely fixed nature of network costs. Transmission pricing will also transition to more cost reflective prices as residual charges are replaced with benefit based charges when future benefit based grid investments are made.

Principle 4

Risk allocation: Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

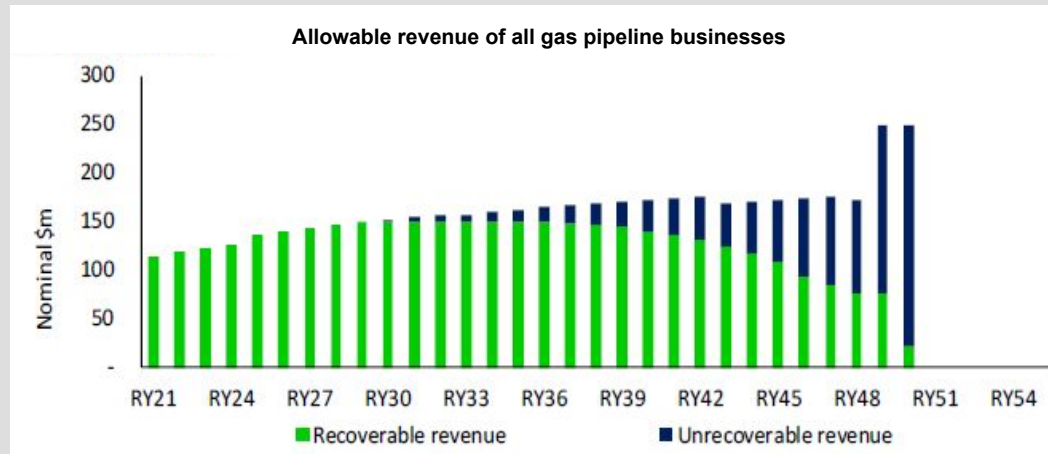
The energy sector currently performs well against this principle:

- **Regulated monopolies allocate risks with regulated boundaries.** Wherever demand risk is low and willingness to pay high, a regulated monopoly can mitigate risk for either users or suppliers by adjusting prices, provided the regulations allow for this.
- **Risks must be re-assessed due to the energy sector transition to renewable electricity.** There are levers to address demand and investment risk which influence prices. The gas sector is challenged by demand uncertainty due to policy decisions but is actively considering innovative solutions such as repurposing the network for green gases like hydrogen.
- **Gas networks have high levels of uncertainty about future demand.** Government policy may impede gas network suppliers from managing demand risk, and prohibit them from adjusting prices to reflect expected disconnections as gas users switch to electricity as illustrated in case study 21 overleaf. This is being monitored through the regulatory regime and at policy level through the Gas Transition Plan.
- **The energy sector transition is making some investments riskier.** Regulation largely drives incentives to invest and risk allocation. Electricity networks will need to invest ahead of demand to facilitate an affordable energy transition. The sector is currently considering how the investment risk is managed through pricing, including for example, allocation of upstream reinforcement costs between current and future new load.

Goal 1: Pricing mechanisms should guide investment decisions

Case study 21 - Asset stranding and willingness to pay

In 2022, the Gas Infrastructure Future Working Group made a submission to the Commerce Commission. Modelling under the current regulatory settings showed there was a high probability that forecast allowable revenue would not be able to be recovered as the networks were wound down towards 2050. The graph below shows how total forecast regulated allowable revenue may not be recovered due to limits on customer willingness to pay. Policy directed at reducing the number of connections to gas would drive up prices for remaining customers, as the same costs would need to be covered by a smaller customer base. From the asset owner perspective, the risk is that assets will be stranded due to a change in policy settings, thus reducing incentives to continue to invest in supplying the regulated gas infrastructure service. From an equity point of view it is possible that customers stranded on the network, paying materially higher prices, would be those who did not have agency or capability to switch appliances to electricity. In response, the Commerce Commission implemented accelerated depreciation for gas transmission and distribution networks to address some of this risk in keeping with **principle 4**. This brings forward capital recovery and increases the near term prices to users while there is still a substantial customer base.



Source: GIFWG submission to Commerce Commission, 12/3/2022, Initial analysis paper

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Goal 2 scoring overview

Goal	RAG rating	Sector direction
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions		

The energy sector is considered to have a mixed performance against Goal 2. Pricing mechanisms signal the different types of interactions with the network and some associated externalities. Pricing is evolving to improve alignment of costs and benefits for users, incentivise demand response and signal future investment costs. This scoring is informed by the detailed analysis of the energy sector against the proposed Pricing Principles that fall under Goal 2:

- Usage behaviour:** Pricing should encourage efficient and appropriate use of the network
- Whole of life costs by type of use:** Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour
- Signalling externalities:** Prices should signal both positive and negative externalities generated by the network and its use
- Appropriate user-funded subsidies:** Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave
- Transparent and reasonable implementation:** Pricing should be developed and implemented in a transparent and reasonable manner



Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle

5

Usage behaviour: Pricing should encourage efficient and appropriate use of the network

The energy sector currently has a mixed performance against this principle:

- **Pricing methodologies are designed to recover fixed costs and signal avoidable costs (through variable charges) for each customer group, and getting the balance between fixed and variable charges is key to influencing usage behaviour.** Legacy pricing conventions were for high variable charges for network services, and the transition to more cost reflective pricing structures is taking some time. Regulation has hindered this transition for residential customers due to caps on fixed charges for low users. Technology limitations have also hindered implementing more cost reflective variable prices. Smarter metering and billing systems are required to record use, develop cost reflective prices and bill consistent with customer demand profiles.
- **Load control and interruptible load (such as irrigation load) respond to price signals to reduce demand at peak times, and avoid investment in additional capacity or loss of supply.** Customers are rewarded with lower prices during control periods, which allows them to reduce their electricity bills.
- **Network pricing signals are not fully passed through in retail charges.** Network prices are becoming more cost reflective, but the price signals are not fully passed on to customers by retailers. Therefore customers are not able to respond to the pricing signal, for example by moving discretionary demand to lower cost, off peak periods.
- **Rewarding demand flexibility.** The electricity market does not yet consistently provide retail tariffs which reward demand side flexibility. Policy makers are seeking to incentivise the uptake of distributed energy resources. Tariffs targeting electric vehicle owners are becoming more prevalent. Regulated minimum feed-in-tariffs for distributed solar generation are not a feature of the market, but have been used in other jurisdictions to incentivise the uptake of distributed energy resource.

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle 6

Whole of life costs by type of use: Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour

The energy sector currently performs well against this principle:

- **The sector is self funding through user charges, and whole of life cost recovery is regulated for networks.** Costs are recovered over the useful life of the assets, and apportioned to users based on user group (e.g. residential and commercial) profiles of use. Network owners finance capital investment, and recover investment costs, through depreciation and return on investment charges recovered through customer prices over time. Operating costs are also recovered through customer prices. Initial connection costs are typically priced separately from usage costs and partially or fully funded up front by the customer.
- **Costs which are driven by usage behaviour are reflected in variable prices.** In energy markets, energy prices are variable, and network and retail prices are a mix of variable and fixed prices - reflecting the cost base. Some variable prices currently recover costs which do not reflect use, partly due to historical convention, customer preference and regulated caps on fixed prices. The sector is moving towards recovering more costs through fixed charges to better align prices to cost drivers. For example customers with solar panels may not be contributing sufficiently to network costs, where fixed costs are recovered through variable charges.
- **Case study 22 on time of use pricing** regimes on the next page provides an example of how pricing regimes can support signalling whole of life costs.

Principle 7

Signalling externalities: Prices should signal both positive and negative externalities generated by the network and its use

The energy sector currently performs well against this principle:

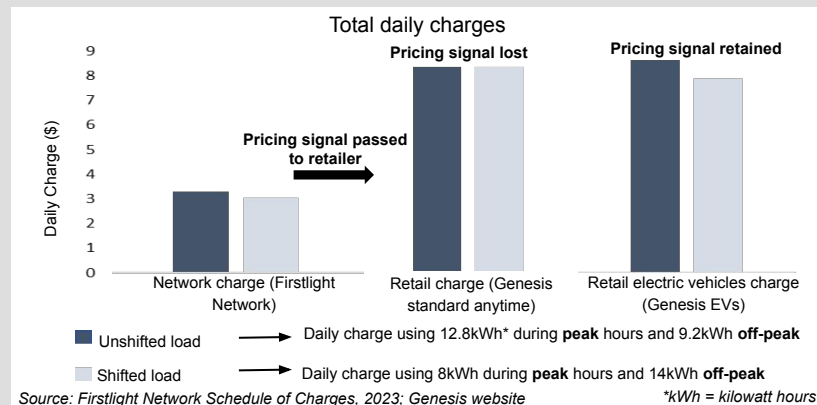
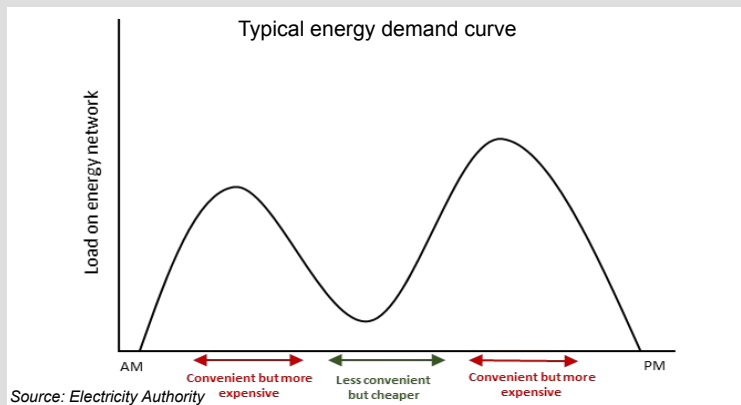
- **Major externalities are environmental and largely driven by generation rather than distribution.** Carbon prices play an important role in the energy system. Generation plants which emit carbon dioxide incur carbon emissions costs, which are passed onto customers through energy prices.
- **There is significant public benefit in widespread access to reliable and resilient energy services.** This is reflected in the regulatory regime which provides for prices which reflect costs necessary to ensure sufficient investment is made to maintain reliable and resilient services. This includes setting the return on investment above the mid-point estimate because of the significant disruption to energy customers that could result from underinvestment. This principle is currently being challenged for gas networks, as the transition of gas demand to electricity, or other fuels, is expected to reduce the criticality of the gas network infrastructure to the energy system.

Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Case study 22 - Time of use pricing regimes

Time of use pricing reflects the impact of usage patterns on costs, and is designed to shift use away from peak times on the network in order to reduce network congestion by offering lower prices during off peak periods. Higher prices during peak periods signal the costs of providing additional network capacity. The effectiveness of the signal will depend on how consumers perceive the trade-off between price and convenience, as indicated in the graph below right. Most electricity distributors have implemented time of use pricing structures, supported by the widespread implementation of electricity smart meters. These are typically structured as peak, shoulder and off peak charges which apply across each day. Off peak charges may also apply on weekends.

Some retailers are not passing on the signal so customers are unable to respond to it. The **graph on the right below** shows the difference in daily charges when a customer shifts load in response to a retail peak pricing signal (electric vehicle charge) compared to a flat variable price (standard anytime), despite the network (Firstlight Network), charging the retailer a higher charge for network use at peak times. **This case study is a useful demonstration of alignment with Principle 6. However, the signal that encourages efficient usage behaviour as per Principle 5 may be muted by retail pricing.**



Goal 2: Pricing should incentivise efficient and socially beneficial network interactions

Principle 8

Appropriate user-funded subsidies: Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave

The energy sector currently has a mixed performance against this principle:

- **Distortionary user subsidies still exist but low user pricing regulations are being phased out.** The electricity low user fixed charge tariff regulations were introduced in 2004 with the intent to incentivise energy efficiency due to the higher variable rates, and to support low-income, low-use households by minimising their fixed charges. This assumes that low-income and low-use are strongly correlated. However this is not always the case, which has resulted in poorly targeted pricing outcomes. The regulations are currently being phased out over a five year transition period which allows for annual increases in fixed retail charges of 30c/day.
- **Some rural/urban price averaging applies within supply regions but cost-reflective differentiation is in place due to geographic network boundaries.** Although urban and rural users connected to a network may pay similar prices, rural users may supplement their network service with off-grid solutions in order to achieve the service quality they require. Currently rural network service levels are lower than urban areas due to network configuration and responsiveness to network outages in rural areas where fewer customer may be affected by an outage.

Principle 9



Transparent and reasonable implementation: Pricing should be developed and implemented in a transparent and reasonable manner

The energy sector currently performs well against this principle:

- **Pricing transparency is mandatory through a well-developed disclosure scheme, which applies for all networks and Transpower.** This regulated requirement to publish pricing methodologies annually means that there is transparency over the components of annual target revenue, allocation to user groups and pricing structures adopted for network pricing. New prices must also be notified to customers before they are implemented, including a comparison with prior period prices. However, some complexity eg: terminology, may be difficult for users. Retailers often present pricing in a more customer friendly manner than networks, which is consistent with the market structure.
- **Networks are required to consult with retailers on changes to pricing.** In the energy market, retailers purchase network services including transmission services, from distributors on behalf of most customers. Networks must consult with retailers on changes to pricing structures before they are implemented. Networks must also comply with common market protocols, including standardised datafiles when billing retailers for network services.
- **Powerswitch enables customer friendly comparisons of electricity and gas pricing plans.** Energy customers are able to compare retail pricing plans available to them through the Powerswitch website which was established to promote retail competition.

Goal 3: Pricing should incentivise broadly distributed benefits

Goal 3 scoring overview

Goal	RAG rating	Sector direction
Goal 3 Pricing should incentivise broadly distributed benefits		

The energy sector is considered to be performing well against Goal 3. In the energy sector, pricing regulation drives the sharing of benefits of efficiencies through prices. There are price-quality trade-offs reflected in prices and this is expected to increase as pricing evolves. Energy hardship at the user level is mitigated by social policy. This scoring is informed by the detailed analysis of the energy sector against the proposed Pricing Principles that fall under Goal 3:

- 10. Benefits of efficiency gains:** Pricing should provide incentives for suppliers to lower prices as they become more efficient
- 11. Price-quality trade-offs:** Prices should allow users to make price-quality trade-offs
- 12. Appropriate publicly-funded subsidies:** Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network, investment in it, or both.

Principle 10

Benefits of efficiency gains: Pricing should provide incentives for suppliers to lower prices as they become more efficient

The energy sector currently performs well against this principle:

- Regulation in the energy sector is designed to distribute efficiency gains and benefits among different users, and incentivises improved efficiency as revenues and expenditure allowances are capped.**
- Explicit financial incentives apply to some electricity distribution businesses.** Electricity distribution businesses that are price-quality regulated are able to retain cost savings for five years before passing these efficiencies on to customers through lower prices. Downward pressure on energy prices also have a large flow on effect to the economy in general.
- Wholesale energy markets are competitive** which incentivises suppliers to remain cost competitive, particularly when supply exceeds demand and wholesale prices fall.

Goal 3: Pricing should incentivise broadly distributed benefits

Principle 11

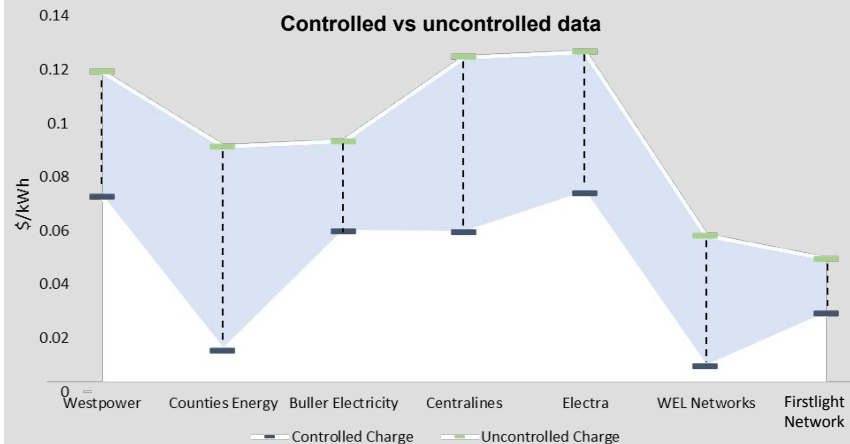
Price-quality trade-offs: Prices should allow users to make price-quality trade-offs

The energy sector currently performs well against this principle:

- **There are price-quality trade-offs reflected in prices and this is expected to increase as pricing evolves.** Networks widely use hot water load control with controlled (discounted) and uncontrolled tariffs, to manage demand at peak times. Large users have options for demand response, and receive discounted network charges for providing this service. Networks receive benefit by reducing investment in network capacity.
- **Value of interruptible load reflected in network prices.** As illustrated in case study 23, networks reflect the value of interruptible load (in this instance the ability to turn off a customer's hot water heating during network peaks) by offering lower prices for customers who offer up their hot water load for this purpose. Networks which are more constrained, like Counties Energy and WEL Networks, offer a more discounted price for this service compared with those who are less constrained, such as Westpower and Firstlight Network.
- **Urban and rural users connected to a network may pay similar prices, however rural users may supplement their network service with off-grid solutions in order to achieve the service quality they require.** This choice is reflected in the level of investment suppliers are required to make in their rural networks, minimising cost to serve as much as possible.

Case study 23 - Ripple control

Electricity distribution businesses have some capacity to manage demand through “ripple control” - which refers to a relay switch on the installation control point which turns off the electric hot water cylinder. It is a network management tool which has been employed since the 1950s. The comparisons between uncontrolled or anytime tariffs and controlled tariffs across a sample of electricity distribution businesses are shown in the graph below. This demonstrates the different value each network places on having the ability to switch off load as needed. **This case study is a useful demonstration of alignment with Principle 11, as the benefit to the network is deferred investment in additional peak capacity, which lowers costs for users.**



Source: Electricity Distribution Businesses FY22 Pricing Methodologies

Goal 3: Pricing should incentivise broadly distributed benefits

Principle 12

Appropriate publicly-funded subsidies: Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network or investment in it, and where these benefits would exist even when pricing already aligns with principles 1-11.

The energy sector currently performs well against this principle:

- **Central government is investing to support decarbonisation.** The Government Investment in Decarbonising Industry Fund is a government initiative to support the investment in decarbonisation projects such as electrification of industrial processes. The fund supports demand side infrastructure upgrades to support the transition to renewable electricity without distorting prices for electricity services. Case study 25 provides an example of projects given co-funding.
- **Energy hardship is currently being addressed through policy, rather than pricing.** Energy hardship is an emerging equity issue and is driven by many factors other than network pricing. The government is taking a holistic look at the causes of energy hardship, but in the interim, affordability of energy use is addressed through social policy - as demonstrated in case study 24 below.
- **Energy and gas provision is almost free of subsidies, especially relative to the transport and water sectors.**

Case study 24 - Winter energy payment

The winter energy payment is a targeted payment to relieve energy hardship which is administered through the Ministry of Social Development. The payment is automatically paid to beneficiaries and those on government superannuation with the intention of supporting those people to maintain warm homes through winter. It will not distort use of, or charges to, others. **This case study demonstrates alignment with Principle 12.**

Source: Work and Income, Winter Energy Payment

Case study 25 - Government Investment in Decarbonising Industry fund

The Government Investment in Decarbonising Industry Fund is a partnership between Government and business to accelerate the decarbonisation of industrial process heat in New Zealand. Below is an example of the projects approved through the fifth round of funding in July 2023. Taken together, these projects are expected to deliver:

- A total reduction of 67,300 tonnes of lifetime carbon abatement.
- An annual carbon abatement equivalent to taking 24,925 cars off the road.

Selection of funded projects:

- **Topuni Timber Electrification (Topuni Timber Ltd) - \$145,000.** Expected to deliver 400 tonnes of lifetime carbon abatement.
- **Mataura Electrification, Decarbonisation and Energy Efficiency project (Alliance Group Limited) \$1,630,000.** Expected to deliver 2,520 tonnes of lifetime carbon abatement.
- **SPM Awarua Electric Boiler, Decarbonisation and Energy Efficiency project (AFFCO New Zealand Limited) \$2,229,157.** Expected to deliver 5,450 tonnes of lifetime carbon abatement.
- **High pressure electrode boiler and high temperature heat pumps, site electrification and decarbonisation project (Open Country Dairy Limited) \$17,696,150.** Expected to deliver 41,110 tonnes of lifetime carbon abatement.

This case study is a useful demonstration of alignment with Principle 12.

Source: The Energy Efficiency and Conservation Authority, The Government Investment in Decarbonising Industry Fund: Round Five Projects - July 2023

Energy - key opportunities for improvement

Key opportunities for improvement

As with the telco sector, the energy sector performs well against the proposed Pricing Goals and Principles, as a result of the strong regulatory framework, effective market signals from the competitive parts of the sector and associated emphasis on using prices to drive outcomes and inform decision-making. Reflecting this, the key opportunities are areas where the existing strong foundation can be built on to continue to drive pricing performance and maturity. This will have benefits for the energy sector in its performance against Goals 1, 2 and 3 as well as supporting improved performance in other sectors.

The key opportunities for improved pricing performance in the energy sector include:

- **Incentivising efficiency.** Pricing practices in electricity are still evolving. However there is strong guidance and monitoring from the regulator which is supporting the sector to move towards improving price signals to incentivise efficient use and investment outcomes, including for new or upgraded connections and more customer (demand side) participation in energy markets.
- **Communicating increased complexity.** The energy system is becoming more complex and pricing will need to adapt as energy markets evolve. Pricing is just one component of more complex market arrangements, and effective customer communication will be key to ensuring pricing plays its part in achieving affordable outcomes for users.
- **The energy transition may require network investment ahead of demand to facilitate decarbonisation.** Pricing approaches will need to consider investment risk and affordability for users during the transition period.





Cross-sector findings



Cross-sector findings - summary

Summary of cross-sector findings

























There is significant variability in pricing performance and levels of pricing maturity across the four sectors, with sectors performing more strongly where the current system settings were designed to promote competition and incentivise efficient investment in services. In particular:

- **Those sectors responsible for funding services predominantly through direct user charges (telco and energy) perform far better against the Pricing Goals and Principles.**
- **System settings are critical to enabling achievement of the pricing goals and principles.** Market structure, policy settings, legislation, and regulation can support or prevent good pricing practice.
- **As operational practice matures, price signals can become more targeted and performance against the principles improves.** For example, many options for price quality trade-offs depend on a level of operational maturity, including transparency, access to data and information, and systems and processes for billing and monitoring.
- **Under-recovery of costs may compromise service quality and lead to cascading failures over time,** despite user willingness to pay for better service and resilience.
- **Recovering the costs of long-lived infrastructure requires a consistent long-term approach** that recognises the risk of changes in demand and technology.
- **Once cost-reflective pricing is implemented, adjustments can reflect either unpriced costs and benefits or reallocate costs among users to achieve other outcomes.** Without it, adjustments risk creating harmful distortions.



Summary scorecard

The summary scorecard below provides a view of performance against the proposed Pricing Goals of all four sectors, to support cross-sector comparison. This summary scorecard demonstrates the impact of the current system settings on sector performance - with the land transport and water sectors having a poorer performance when compared to the telco and energy sectors. This reflects the significantly different system settings within these sectors - with the latter two responsible for fully funding services through user charges. **Appendix D contains a summary of the performance of each sector against the proposed Pricing Goals and Principles.**

	Land transport		Water		Telco		Energy	
Goal	RAG rating	Sector direction	RAG rating	Sector direction	RAG rating	Sector direction	RAG rating	Sector direction
Goal 1 Pricing mechanisms should guide investment decisions								
Goal 2 Pricing should incentivise efficient and socially beneficial network interactions								
Goal 3 Pricing should incentivise broadly distributed benefits								

Key opportunities across the four sectors

Based on the current pricing analysis, key opportunities to improve pricing performance and outcomes were identified within each of the four sectors.

Land transport	Water	Telco	Energy
<ul style="list-style-type: none"> • Reduction in non-priced use. Many users do not pay directly for the transport services they use (eg, free on-street parking, electric vehicle' exemption from road user charges), which harms cost-recovery and incentivises inefficient use. System settings prevent sector-wide implementation of cost-recovery from users. • Building evidence base to inform decision-making. There is a substantial misalignment of investment risk and benefits, and the incentives for investment are driven by policy rather than pricing. • More explicit pricing of externalities, such as through congestion pricing, would enhance options assessment and network efficiency, as well as improved pricing to signal the willingness to pay for changes in service levels and transport mode options. • Improving price signals. Existing pricing mechanisms and exceptions lack signalling power for investment and could be improved. 	<ul style="list-style-type: none"> • Future funding of water services. Current reforms seek to improve the future funding and financing of water services, including through more widespread use-based charges. • Building evidence base to inform decision-making. Pricing practices generally do not reflect investment choices and service quality options. Alongside this, a better understanding of existing cross subsidies between groups of water service users and other stakeholders will help to guide pricing reform. • Investing in metering. The transition away from fixed charges to volumetric charging has begun to improve price signals to users but more investment in metering is required. • Tailoring stormwater funding solutions. Stormwater services are interconnected with other infrastructure and require tailored funding solutions. 	<ul style="list-style-type: none"> • Improving equity. Pricing could evolve to improve services for user groups experiencing digital poverty (due to unaffordability of access and poor connectivity options in remote areas), which would likely improve net public benefits. • Evolving network pricing. Network pricing could evolve to better match costs, benefits and service levels. Fibre network suppliers have an opportunity to develop greater capability in monitoring what the market can bear alongside the risk of stranded assets as technology evolves. • Retail pricing sophistication. Retail pricing approaches miss an opportunity to apply more sophisticated pricing for congestion at peak times. This mutes signals both for users on the costs of usage patterns, and for suppliers on user willingness to pay for greater capacity at peak. • Managing risks. While public funding supported the investment in fibre ahead of demand, technology risk remains. Regulation of prices will need to adapt accordingly, including potentially removing regulatory constraints if user uptake of fibre starts to decline due to other technologies. 	<ul style="list-style-type: none"> • Incentivising efficiency. Pricing practices in electricity are still evolving, however there is strong guidance and monitoring from the regulator which is supporting the sector to move towards improving price signals to incentivise efficient use and investment outcomes. • Communicating increased complexity. The energy system is becoming more complex and pricing will need to adapt as energy markets evolve. • The energy transition may require network investment ahead of demand to facilitate decarbonisation. Pricing approaches will need to consider investment risk and affordability for users during the transition period.

3

Conclusion and key
themes

Conclusion: key themes and lessons - section overview

Focus of this section

This section highlights the key themes and lessons from the application of proposed Pricing Goals and Principles:

- **Key themes from current pricing analysis.** This describes the key themes identified through the current pricing analysis, with a focus on the key factors that can create high performance.
- **Key lessons from the application of the proposed Pricing Goals and Principles.** This explains the key lessons identified through the application of the proposed Pricing Goals and Principles to support the ongoing development of the economic framework for pricing infrastructure as well as its future application.
- **Next steps.** This explains how the current pricing analysis in this report will support Te Waihanga's ongoing development of the economic framework for pricing infrastructure.



Key themes identified through current pricing analysis (1 of 2)

The current pricing analysis and cross-sector findings in Section 2 enabled the identification of key themes relevant to implementing the Pricing Goals and Principles. These themes are focused on the areas critical for driving improved pricing performance across the four sectors, and are described below.

System settings

Competition or regulation to promote outcomes consistent with the outcomes of competitive markets provide effective signals to both suppliers and users.

Sectors where competition exists, supported by regulatory oversight where appropriate, generally perform more highly against the proposed Pricing Goals and Principles.

Missing signals for network configuration decisions create long-term distortions and path dependency.

A critical weakness in underperforming sectors is a lack of understanding about the full social and economic costs of competing options for network configuration, or a separation of decision making from those who do understand these costs.

Prices set by policy dampen key signals and are vulnerable to capture for purposes other than the efficient provision of infrastructure.

Compared to prices set by regulation or in competitive markets, legislated or policy-based prices are less responsive to changes in the network and its use.

Implementation

Usage data is critical to inform the decisions of suppliers and decision-makers

Quality data is key and the ability to implement many of the Pricing Principles well is predicated on being able to access detailed data on use.

Pricing signals need to be understandable and reach the user to be effective.

Simplicity in a signal is critical. Where there is a lack of vertical integration in a sector, the party interacting with the customer should have the responsibility of making sure appropriate signals are received and understood.

Key themes identified through current pricing analysis (2 of 2)

The current pricing analysis and cross-sector findings in Section 2 enabled the identification of key themes relevant to implementing the Pricing Goals and Principles. These themes are focused on the areas critical for driving improved pricing performance across the four sectors, and are described below.

Adjustments

Positive externalities lead to underinvestment, negative externalities to overinvestment.

Where network use drives large costs or benefits to the public that remain unpriced, investment levels and configuration choices become distorted, leading to funding difficulties, adverse impacts on people or environments, and suboptimal network performance.

Central government funding can support outcomes where strong external benefits are provided by the network.

Intervention by government by providing investment ahead of need or in support of other policy goals, can positively influence the achievement of the proposed Pricing Goals and Principles.

Understanding user willingness to pay is key to supporting more equitable outcomes.

The ability to differentiate levels of service creates more opportunity to differentiate prices, which allows more efficient cost recovery while also ensuring broad accessibility to the service. This could be restricted by the physical or technical nature of the network but should provide incentives to innovate.

Key lessons from application of the proposed Pricing Goals and Principles

Alongside building understanding of how the current system settings of the four sectors perform against the proposed Pricing Goals and Principles, the current pricing analysis was also designed to identify lessons from the application of the proposed Pricing Goals and Principles in order to support Te Waihanga's continued development of the economic framework for pricing infrastructure and its future application. **The overarching key lessons are included below, and Appendix C provides a detailed view of updates to the proposed Pricing Goals and Principles as a result of the current pricing analysis.**

Lesson One

The proposed Pricing Goals and Principles are applicable, and enable analysis, across the four sectors.

The current pricing analysis tested the applicability of the proposed Pricing Goals and Principles across the four sectors. This demonstrated that the proposed Goals and Principles are largely effective in building a sector-agnostic understanding of the components of strong pricing performance. This holds despite some of the proposed Pricing Principles having more applicability to some sectors than others. With some adjustments, these principles will form an appropriate foundation for the economic framework for pricing infrastructure.

Lesson Two

Communication of the proposed Pricing Goals and Principles needs to reflect the wide range of stakeholders across the four sectors to which they are intended to apply.

To be effective, the proposed Pricing Goals and Principles need to be well understood by a range of audiences - including those involved in price setting, decision-makers, policy-makers and users. Through the current pricing analysis, opportunities to simplify the proposed Pricing Goals and Principles were identified (as shown in Appendix C). This lesson will continue to be critical as Te Waihanga takes forward the development of the economic framework for pricing infrastructure.

Lesson Three

The design of pricing systems must consider not only the different roles of pricing, but also the limits of pricing as a tool to achieve policy objectives.

Infrastructure pricing has several important roles. Infrastructure pricing sends signals to suppliers, about where they should invest in increased capacity or improved services. It also sends signals to users about when, where, and how they should use networks. There is a risk that using pricing to achieve broader central or local government objectives can undermine signals to suppliers and users.

Lesson Four

There is a hierarchy of infrastructure Pricing Goals and Principles.

Goal 1 is the most important to get right first, because it guides sector-wide investment and network configuration choices that have long-lived, path-dependent impacts on infrastructure. Goal 2 is the next most important, as it sends signals to users about when, where, and how they should use networks to maximise overall social benefits. Goal 3, which relates to adjustments to improve affordability and accessibility for subgroups of users, should be pursued after the basics of pricing are achieved, rather than as an alternative.

Looking ahead

Ongoing development of the economic framework for pricing infrastructure

The current pricing analysis in this report forms Part 2 of the overarching four part Pricing Study commissioned by Te Waihanga to support the development of the economic framework for pricing. It therefore builds on Part 1, where the proposed Pricing Principles and Goals were developed and tested with Te Waihanga and stakeholders to support refinement.

Reflecting the fit of the current pricing analysis with the overarching Pricing Study, the information and findings in this report will be used to support:

- Ongoing engagement with a range of infrastructure stakeholders - to enable the continued testing and development of the evidence base for the economic framework for pricing.
- Initial engagement with central and local government decision-makers - to build understanding and awareness of the potential benefits and key opportunities to improve the application of pricing.
- Te Waihanga's ongoing policy development and advice on pricing, including through the development of the next infrastructure strategy.

The current pricing analysis will be combined with the other parts of the Pricing Study into a final report, to provide a single reference point for Te Waihanga.





Appendices

Appendix A: Restrictions

This document has been prepared for and only for Te Waihanga in accordance with the Consultancy Services Order dated 16 January 2023.

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Appendix B: Pricing Goals and Principles used in this analysis (detailed version)

Plain english version adopted for current pricing analysis

Pricing mechanisms should guide investment decisions

1. **Quality of service:** Pricing should create incentives to improve the quality of service in ways that users want to pay for
2. **Network configuration options:** Pricing should reflect differences in whole of life costs between network configuration options
3. **Level of investment:** Pricing should incentivise a level of investment which balances the associated benefits and costs
4. **Risk allocation:** Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them

Pricing should incentivise efficient and socially beneficial network interactions

5. **Usage behaviour:** Pricing should encourage efficient and appropriate use of the network
6. **Whole of life costs by type of use:** Prices should reflect the whole of life costs of the network, including initial investment costs, connection costs, and costs driven by usage behaviour
7. **Signalling externalities:** Prices should signal both positive and negative externalities generated by the network and its use
8. **Appropriate user-funded subsidies:** Pricing may allow appropriate user-funded cross-subsidies, or recovery of revenue shortfall for suppliers, with minimum distortions in how the subsidising users behave
9. **Transparent and reasonable implementation:** Pricing should be developed and implemented in a transparent and reasonable manner

Pricing should incentivise broadly distributed benefits

10. **Benefits of efficiency gains:** Pricing should provide incentives for suppliers to lower prices as they become more efficient
11. **Price-quality trade-offs:** Prices should allow users to make price-quality trade-offs
12. **Appropriate publicly-funded subsidies:** Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network or investment in it, and where these benefits would exist even when pricing already aligns with principles 1-11.

Detailed version to support technical application

Goal 1: Harness the signalling power of prices to guide investment choices and allocate risk

1. Pricing should incentivise suppliers to invest in improvements to efficiency, resilience, and quality of supply in ways that reflect user and stakeholder demand.
2. Pricing should send timely signals to suppliers and users about the whole of life and risk-adjusted cost differences between configuration options for the network.
3. Pricing should incentivise an efficient level of investment in the network, where an increase would involve more costs than benefits, and a decrease would give up more benefits than it saves in costs.
4. Pricing regimes should align the risks and rewards of investment among sector participants so that risks fall on those with the greatest ability to manage them.

Goal 2: Incentivise efficient and socially beneficial investment, configuration, and usage

5. Pricing should encourage usage behaviour that optimises network cost-efficiency and discourage misuse.
6. Prices should reflect the whole of life costs of availability, connection, and use of the network, noting these may be priced separately.
7. Prices that signal whole of life costs should be adjusted by intervention, where practical, to signal the external costs and benefits of use of the network where this incentivises socially beneficial changes in usage, investment levels or network configuration.
8. Where prices that signal whole of life and external costs would prevent a subset of users from accessing a minimum level of service, or under-recover costs for suppliers, price-based adjustments may be applied in ways that minimise distortions in usage behaviour.
9. Prices for users or groups of users should be developed transparently and with regard to what can reasonably be expected of users and suppliers given the practical challenges of implementation in each sector.








Goal 3: Incentivise broadly distributed benefits among stakeholders

10. Pricing should provide incentives to suppliers to share the benefits of efficiency gains with users and other stakeholders.
11. Prices should allow users to make trade-offs between the quality, timing, or level of service they receive and the price they pay.
12. Pricing as a cost-recovery mechanism should be supplemented by public funding where:
 - net external benefits are positive and widely distributed among stakeholders, including among the least advantaged, and
 - funding shortfalls or prices that comply with Principles 1-11 would otherwise prevent socially beneficial quality levels or usage behaviour.

Appendix C: Overview of key changes to proposed Pricing Goals and Principles after undertaking this analysis

Updated proposed Pricing Goals and Principles	Explanation and rationale for changes
<p>Pricing mechanisms should guide investment decisions</p> <ol style="list-style-type: none"> Whole of life costs: Prices should reflect all costs of the network, including both up front and ongoing costs Network configuration options: Pricing should reflect differences in total costs between different network configuration Level of investment: Pricing should incentivise a level of investment which balances the associated benefits and costs Risk allocation: Pricing should allocate risks to those who are most capable of managing them or stand to benefit from higher rewards by bearing them Benefits of efficiency gains: Pricing should provide incentives for suppliers to lower prices as they become more efficient 	<p>Goal 1: Harness the signalling power of prices to guide investment choices and allocate risk</p> <p>We have moved principle 6 to principle 1 as we see this as the foundational relationship between pricing and investment in infrastructure.</p> <p>We have moved principle 10 (now 5) to be under Goal 1 because while it does have distributional effects, the core of the principle is about incentivising suppliers to invest in efficiency. Making sure gains are shared through lower prices is not as challenging as providing incentives for suppliers to improve.</p>
<p>Pricing should incentivise efficient and socially beneficial network interactions</p> <ol style="list-style-type: none"> Usage behaviour: Pricing should discourage misuse of the network and encourage usage behaviour that optimises network cost-efficiency Quality and choice: Pricing should incentivise suppliers to invest in improvements to quality of supply in ways that reflect user and stakeholder demand and enable price-quality trade-offs. External costs and benefits: Prices should signal external costs and benefits generated by the network and its use to the extent that this incentivises socially beneficial changes in usage behaviour. User friendly implementation: Pricing should be developed and implemented in a transparent and reasonable manner 	<p>Goal 2: Incentivise efficient and socially beneficial investment, configuration, and usage</p> <p>Principle 5 is unchanged but is now principle 6.</p> <p>We have combined Principles 1 and 11 into the new principle 7 as both concern the quality of service offered, whether from the supplier investment perspective or the consumer options perspective.</p> <p>We have revised the label of principle 9 to “User Friendly Implementation” and replaced the word externalities for the plain english to external costs and benefits.</p> <p>We have moved principle 8 to Goal 3 for the reasons outlined below.</p>
<p>Pricing should incentivise broadly distributed benefits</p> <ol style="list-style-type: none"> Adjustments minimise distortions: Pricing may allow subsidies between users or adjustments for cost-recovery where these do not create undue changes in usage behaviour Appropriate public subsidies: Publicly-funded subsidies are warranted where broad net benefits to the public would arise from greater use of the network or investment in it, and where these benefits would exist even when pricing already aligns with principles 1-11. 	<p>Goal 3: Generate broadly distributed benefits for society</p> <p>We have adjusted the phrasing of Goal 3 to focus on the desired outcomes for society that may not be adequately provided for by adherence to Principles under the first two Pricing Goals. Two categories of adjustments are considered - those funded by users and those funded by taxpayers.</p> <p>Principle 8 has been moved to Goal 3 (now principle 10). It concerns the distribution of costs and benefits in two ways, but imposes the same condition on each. The first way concerns distribution between high-cost and low-cost users, the second concerns distribution of the cost burden of recovering revenue shortfalls for suppliers.</p> <p>Principle 12 is unchanged but is now principle 11.</p>

Appendix D: Summary proposed Pricing Goals and Principles performance

Goal	Principle	Land transport		Water		Telco		Energy	
		Principle performance	Goal RAG	Principle performance	Goal RAG	Principle performance	Goal RAG	Principle performance	Goal RAG
Goal 1: Pricing mechanisms should guide investment decisions	1. Quality of service	Underperforms		Mixed		Performs well		Mixed	
	2. Network configuration options	Underperforms		Mixed		Performs well		Mixed	
	3. Level of investment	Mixed		Mixed		Mixed		Performs well	
	4. Risk allocation	Mixed		Mixed		Performs well		Performs well	
Goal 2: Pricing should incentivise efficient and socially beneficial network interactions	5. Usage behaviour	Mixed		Mixed		Mixed		Mixed	
	6. Whole of life costs by type of use	Mixed		Performs well		Mixed		Performs well	
	7. Signalling externalities	Underperforms		Mixed		Performs well		Performs well	
	8. Appropriate user-funded subsidies	Mixed		Mixed		Mixed		Mixed	
	9. Transparent and reasonable implementation	Mixed		Mixed		Mixed		Performs well	
Goal 3: Pricing should incentivise broadly distributed benefits	10. Benefits of efficiency gains	Mixed		Mixed		Performs well		Performs well	
	11. Price-quality trade-offs	Mixed		Mixed		Performs well		Performs well	
	12. Appropriate publicly-funded subsidies	Mixed		Mixed		Performs well		Performs well	

Appendix E: Reference list (1 of 4)

Land transport sector resources

Current system settings resources

- Auckland Transport website, Bus & Train fares
- Auckland Transport, City Rail Link Business Case 2015
- Greater Auckland, The National Land Transport Programme 2021 - 2024, 2021
- Ministry of Business, Innovation & Employment, Duties, taxes and direct levies on motor fuels in New Zealand
- Ministry of Transport (Te Manatū Waka), Background to the road user charges (RUC) system 2022
- Ministry of Transport (Te Manatū Waka), Domestic Transport Costs and Charges Study 2023
- Ministry of Transport (Te Manatū Waka), Government Policy Statement on Land Transport 2021/22 - 2030/31
- New Zealand Infrastructure Commission, How much do we pay for infrastructure? Household expenditure on infrastructure services 2023
- New Zealand Legislation, Crown Entities Act 2004
- New Zealand Legislation, Government Rounding Powers Act 1989
- New Zealand Legislation, Land Transport Act 1999
- New Zealand Legislation, State Owned Enterprises Act 1986
- New Zealand Legislation, The Land Transport (Rail) Legislation Act 2020
- New Zealand Legislation, The Railways Act 2005
- NZ Transport Agency website, Funding system
- NZ Transport Agency website, Licensing (rego) fees
- NZ Transport Agency website, National Land Transport Funding
- NZ Transport Agency website, Rail safety fees and charges
- NZ Transport Agency website, Registration fees
- NZ Transport Agency website, Road user charges
- NZ Transport Agency website, The land transport regulatory system
- NZ Transport Agency website, Transport transition

Case study resources

- **Case study 1 - Development contributions in practice: Drury.** Sources:
 - Auckland Council Drury Development contribution model released 12 September 2022
 - G2 Detailed transport costs v3; Te Waihangā Analysis .
- **Case study 2 - Cost of infringement compared to parking.** Transport (Offences and Penalties) Regulations 1999 (revised 2006), Schedule 1b
- **Case study 3 - The unpriced cost of space.** Sources:
 - Littman, T., NCE Cities - Sprawl Subsidy Report.
 - QV Property analysis
- **Case study 4 - Prices which reflect use.** Source: Waka Kotahi, road user charges rates and transaction fees.
- **Case study 5 - Electric vehicles road user charges exemption.** Source: Road User Charges (Exemption Period for Light Electric RUC Vehicles (order 2012), New Zealand Government
- **Case study 6 - Lime scooters.** Sources:
 - Micromobility: Licensing and regulating e-scooter and e-bike rental operators, Auckland Council
 - New Licences for e-scooter and e-bike businesses in Auckland, Our Auckland Auckland Council, 2022
- **Case study 7 - Toll roads: targeted prices.** Source: Z Transport Agency, Tolls and fees
- **Case study 8 - Impact of half price fares.** Source Waka Kotahi RN009A - Impact of half-price public transport fares - a research note February 2023
- **Case study 9 - The role of technology and data.** Sources:
 - Texas Department of Transportation, TEXpress Lanes.
 - California Public Utilities Commission
 - The Congestion Question Technical Report, July 2020
- **Case study 10 - Congestion pricing: an example of what could be.** Source: The Congestion Question Technical Report, July 2020

Appendix E: Reference list (2 of 4)

Water sector resources

Current system settings resources

- New Zealand Legislation, Local Government Act 2002
- New Zealand Legislation, Local Government (Auckland Council) Act 2009
- New Zealand Legislation, Taumata Arowai—the Water Services Regulator Act 2020
- New Zealand Legislation, Water Services Act 2021
- Local council websites/Rate Schedules
- Local Government in New Zealand - Local Councils
- Water Services Reform Programme website

Case study resources

- **Case study 11 - Unintended effects of urban growth planning on the wastewater network.** Source: *Watercare Asset Management Plan 2021 (Watercare AMP)*.
- **Case study 12 - Infrastructure growth charges price schedule.** Source: *Watercare, Infrastructure Growth Charge*.
- **Case study 13 - Metered vs unmetered use.** Source: *Building Research Association of New Zealand (BRANZ), Residential water tariffs in New Zealand, 2018*.
- **Case study 14 - Impacts of volumetric pricing: metered vs unmetered wastewater.** Source: *Watercare Domestic water services and wastewater charges and IGC, 2023 - 2024*.
- **Case study 15 - Increasing block tariff at Foxton Beach.** Source: *Horowhenua District Council, Water Consumption Rates*.
- **Case study 16 - Variable pricing.** source: *Hunter Water, Customer Charges, effective 1 July 2023 to 30 June 2024*

Appendix E: Reference list (3 of 4)

Telco sector resources

Current system settings resources

- Commerce Commission, *Annual Telecommunications Monitoring Reports*
- Commerce Commission, *Telecommunications Draft Product Disclosure – Retail Service Bundling Guidelines*, September 2023
- Commerce Commission, *Fibre price-quality path and information disclosures*
- Commerce Commission, *Fixed line telecommunications Regulation Overview 2020*
- Commerce Commission, *Regulated industries - Telecommunications*
- Commerce Commission, *Regulated industries - Fibre*
- Ministry of Business, Innovation & Employment, *Fibre regulations*
- New Zealand Legislation, *Broadband Marketing Code*
- New Zealand Legislation, *Fair trading act*
- New Zealand Legislation, *Number porting regulation*
- New Zealand Legislation, *Telco Carriers Forum Code*
- New Zealand Legislation, *Telecommunications Act 2001 (Part 2 & 6)*
- New Zealand Legislation, *Telecommunications (Interception Capability and Security) Act 2013*
- New Zealand Legislation, *The Commerce Act 1986 (Part 2)*
- New Zealand Legislation, *The Radiocommunications Act 1989*
- Spark Foundation *Annual Report 2022*

Case study resources

- **Case study 17 - Investment in fibre ahead of uptake and risk allocation.**
Sources:
 - *UFB investment and fibre connection values - Chorus Annual Reports 2013 - 2021*
 - *Cumulative sites passed - Chorus Our Fibre Plans Report, 2020*
 - *Chorus RAB - Commerce Commission - Chorus' initial regulatory asset base as at 1 January 2022*
- **Case study 18 - Price-quality trade offs in broadband.** *Source: Chorus study based on Measuring Broadband New Zealand (MBNZ) report*
- **Case study 19 - Fibre availability in the South Island.** *Source: Broadband map NZ, 2023*

Appendix E: Reference list (4 of 4)

Energy sector resources

Current system settings resources

- Commerce Commission New Zealand, Regulated industries - Electricity Lines
- Commerce Commission New Zealand, Regulated industries - Gas pipelines
- Electricity Authority, Industry
- Electricity Distribution Businesses - Commerce Commission, Pricing Methodology and Schedules
- Energy retailers publicly displayed pricing on websites
- First Gas Pricing Methodology for Gas Transmission Services
- Gas distribution pipelines - Commerce Commission, input methodologies
- Gas Industry Co., Gas market settings investigation
- Gas Industry Co., Gas production and consumption
- New Zealand Legislation, The Electricity Industry Act 2010, New Zealand Legislation
- New Zealand Legislation, The Commerce Act 1986
- New Zealand Legislation, The Gas Act 1992
- Transpower Pricing Methodology

Case study resources

- **Case study 20 - Regulated quality incentive scheme:** Source: Commerce Commission
- **Case study 21 - Asset stranding and willingness to pay:** Source: GFWG submission to Commerce Commission, 12/3/2022, Initial analysis paper
- **Case study 22 - Time of use pricing regimes:** Sources:
 - Firstlight Network Schedule of Charges, 2023; Genesis charges on website
 - Electricity Authority
- **Case study 23 - Ripple control.** Source: Electricity Distribution Businesses FY22 Pricing Methodologies
- **Case study 24 - Winter energy payment.** Source: Work and Income, Winter Energy Payment
- **Case study 25 - Government Investment in Decarbonising Industry fund.** Source: The Energy Efficiency and Conservation Authority, The Government Investment in Decarbonising Industry Fund: Round Four Projects - July 2023



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