

Key priorities for the New Zealand electricity industry



Information for Ministers
and Ministerial Review



7 February 2025

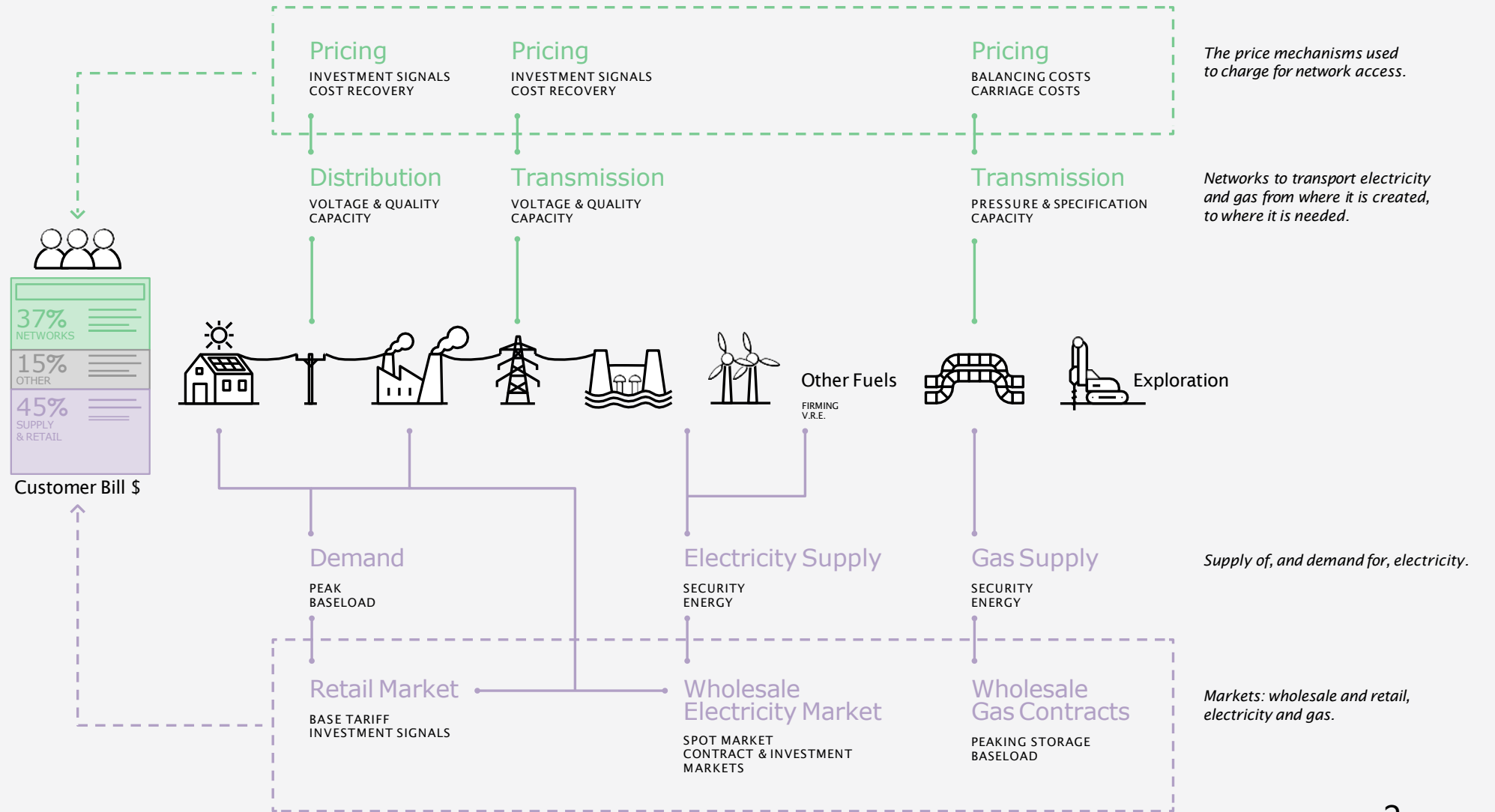
New Zealand's Energy System

A basic overview of electricity system 'architecture'.

Electricity and energy underpin almost all aspects of economic and societal activity. Electricity systems have critical 'jobs' to do for the economy and society. These systems are also necessarily complex. Our conception of the electricity industry spans four

broad components. The market was launched in 1996, and has undergone incremental change since. The design of the market strikes a careful balance between operational coordination (meeting demand and providing resilience) and enabling competition amongst

investors to find the lowest cost and lowest risk future for the overall system, and therefore the customer.

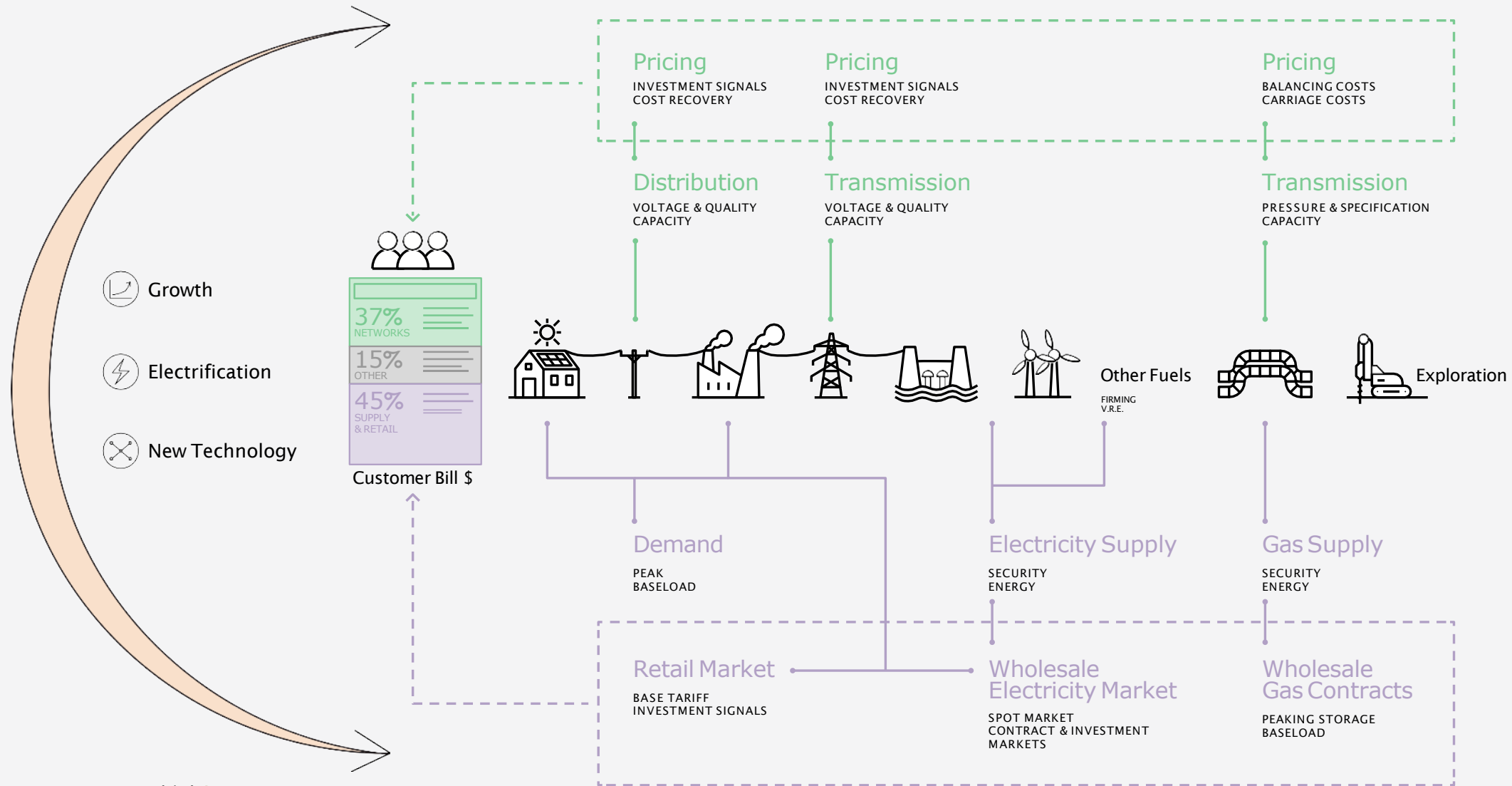


Pressures on Our Energy System

The system is experiencing profound changes, most of them externally driven.

Our electricity system is not the same system it was in 1996. Variable renewables are now prevalent in the system, and the technology driving demand, have both changed materially. Together, these two changes mean that the best pathway for

decarbonising the energy system is to electrify transport and process heat (giving rise to 20Mt of emissions today), and meet the resulting demand by growing a highly renewable electricity system (responsible for around 4Mt of emissions today).



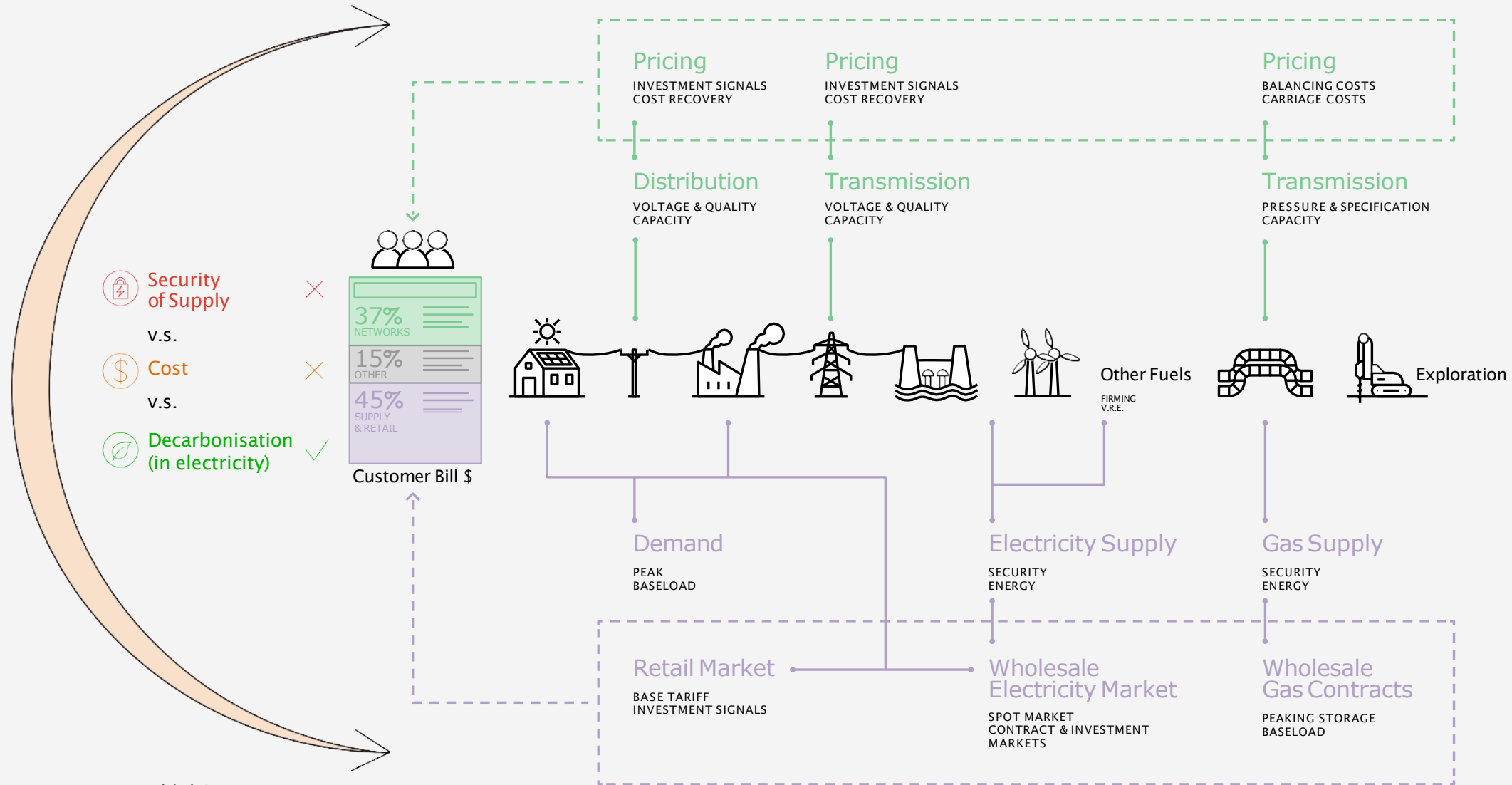
These Pressures Are Creating Tension

Illustrating the decarbonisation-security-affordability issues through the lens of the trilemma.

The World Energy Council energy trilemma highlights that the stability of energy systems worldwide can be characterised as requiring tradeoffs between three 'limbs' – sustainability, affordability, and security.

The energy trilemma highlights that the tensions between decarbonisation, cost, and security & reliability must be carefully balanced. Allowing any of the legs of the trilemma to fall out of balance can then affect the other legs.

The New Zealand electricity system is out of balance.

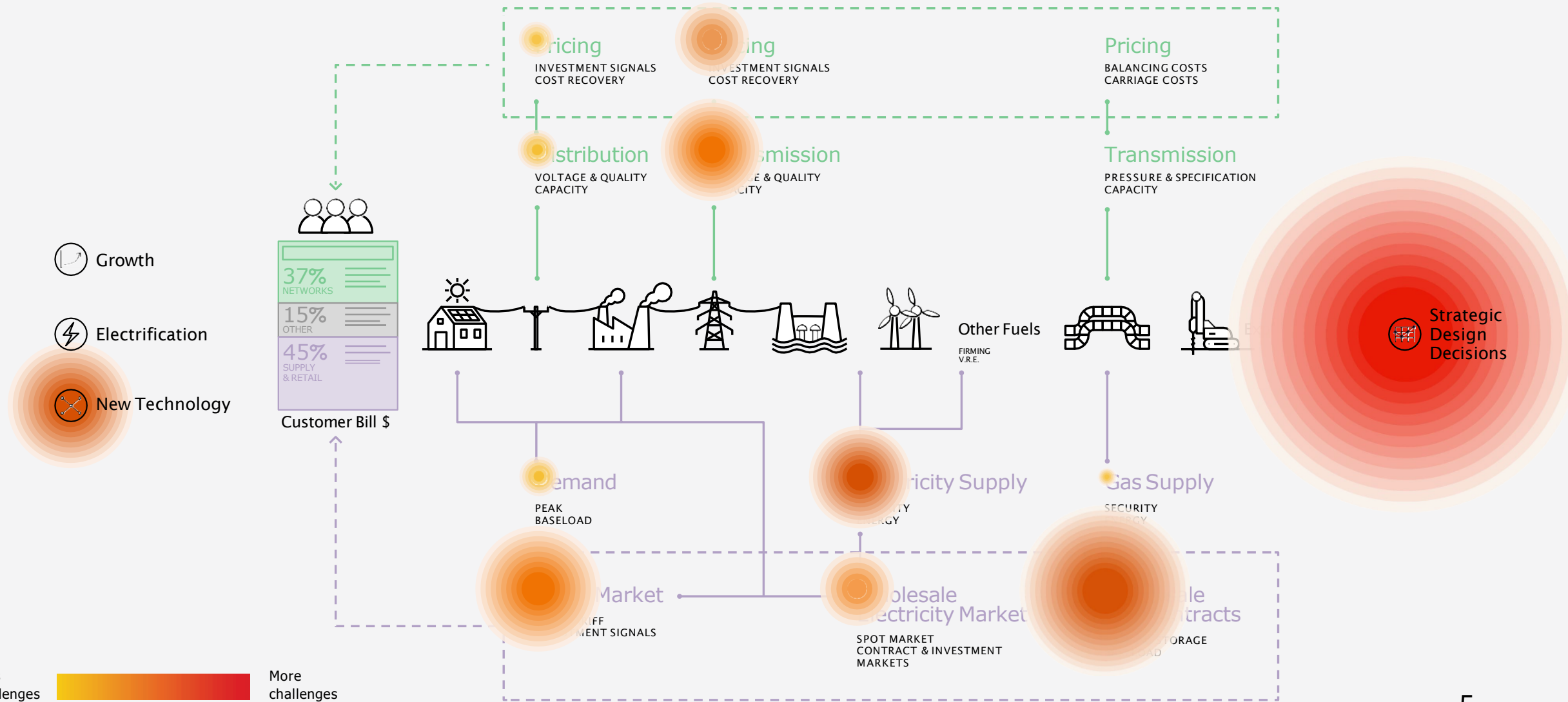


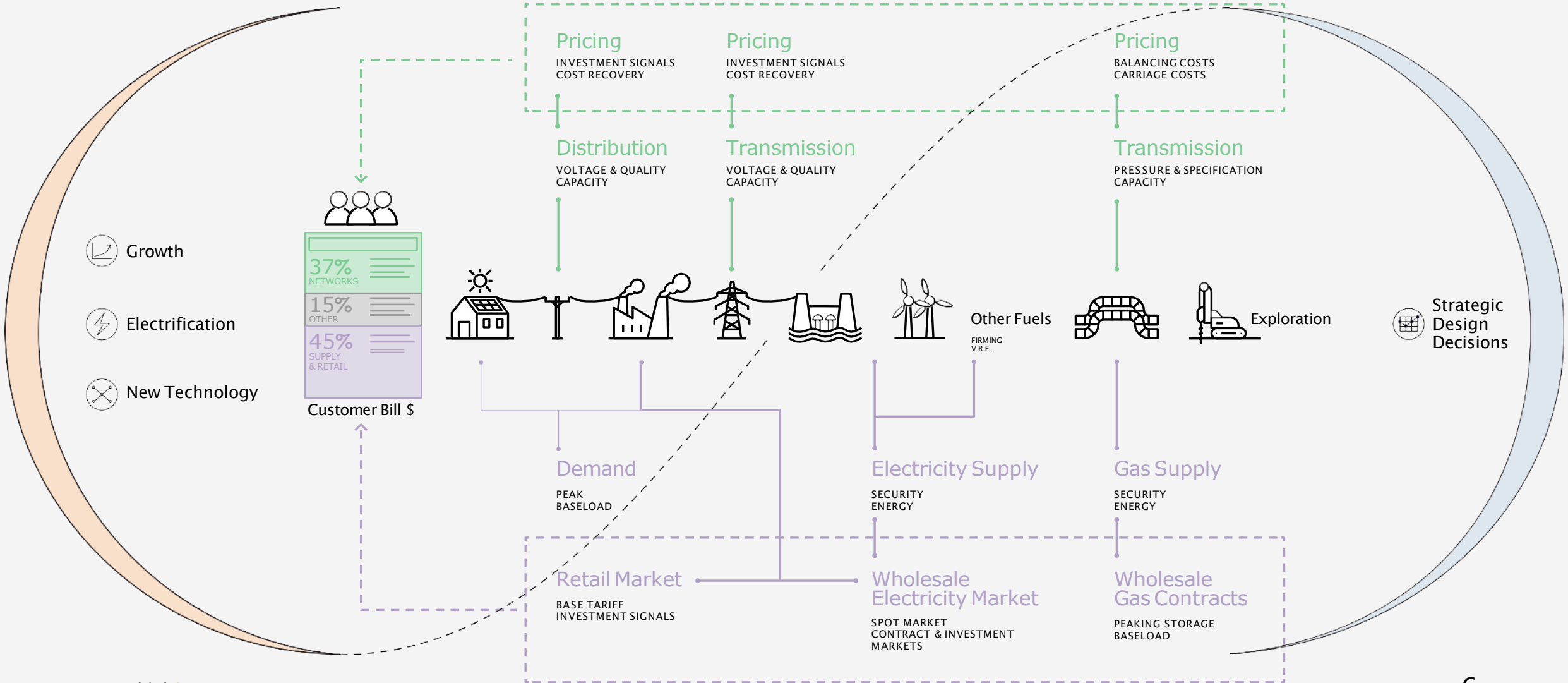
Taking a Holistic View of the Challenges

These changes are seeing issues manifest across the system.

The changes in the external environment, and their impact on investment and operation of the industry, are seeing a number of interconnected issues manifest across the system. These issues often highlight aspects of our market and governance design that

need to be updated. Given the number of issues, prioritising which need to be updated first will be critical.





The Four Key Priorities

The issues fall into four clusters, which are interconnected.

1.
Flexibility and Security
of Supply

2.
Networks and Distributed
Energy Resources

3.
Consumer
Engagement

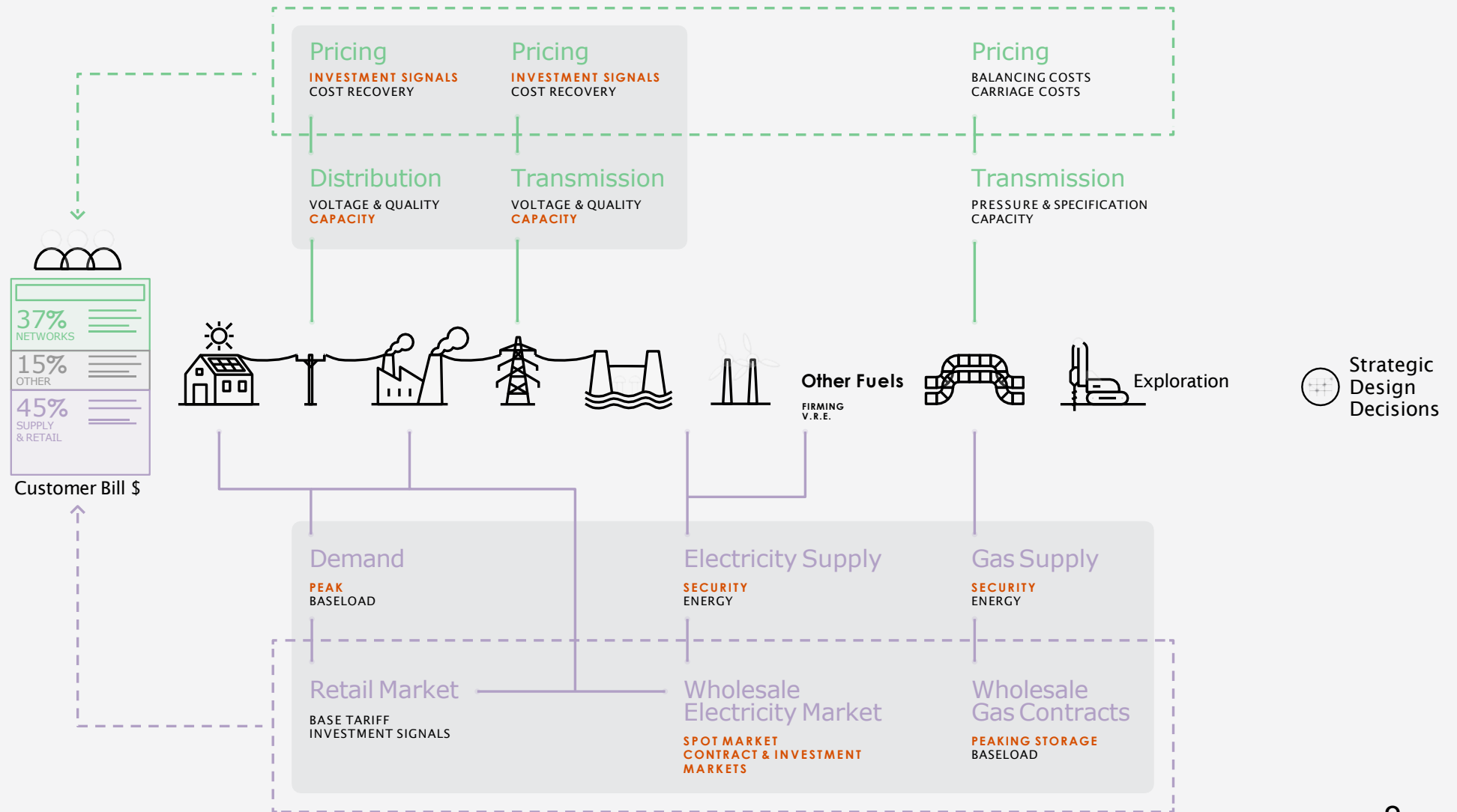
4.
Strategic Assumptions
and Design

1. Flexibility and Security of Supply
2. Networks and Distributed Energy Resources
3. Consumer Engagement
4. Strategic Assumptions and Design

Firm and flexible resources – hydro, gas, coal, diesel and demand response - have underpinned security of supply in New Zealand since the market began in 1996.

The nature of security of supply – focused on weather-driven peak demand periods, and/or low inflow years - results in significant revenue risk to an investor. Managing this risk requires well-functioning contract markets – both for the output of the resource, but also for any fuel that it is reliant on.

Robust, implementable and cost-effective solutions to replace gas and coal in providing security of supply services (including hydro firming in low inflow periods) have not been credibly identified.

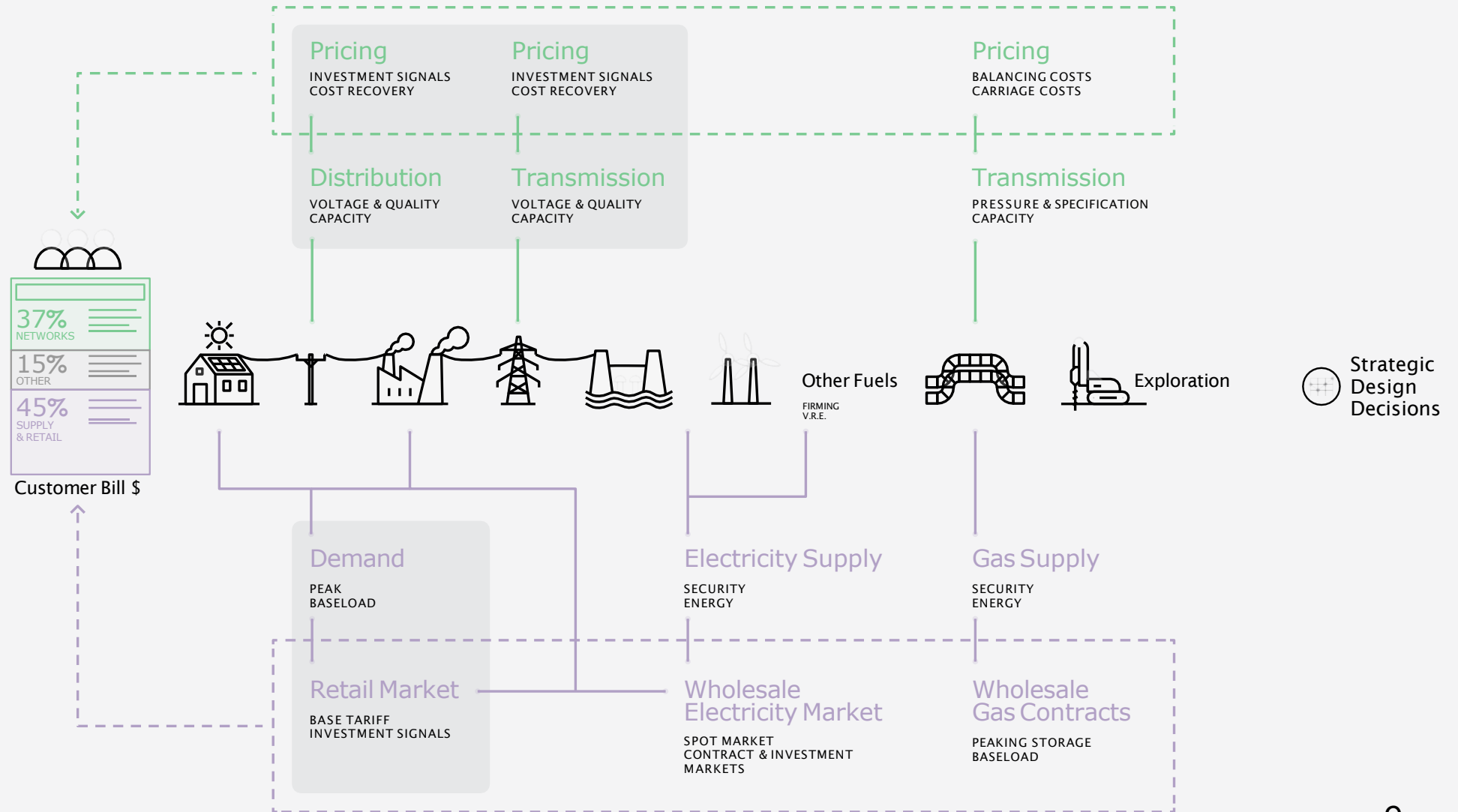


1. Flexibility and Security of Supply
2. Networks and Distributed Energy Resources
3. Consumer Engagement
4. Strategic Assumptions and Design

Transmission and distribution businesses are expected to spend \$85B over the next 25 years on maintaining and expanding their networks. This is nearly four times the anticipated investment in generation over the same period.

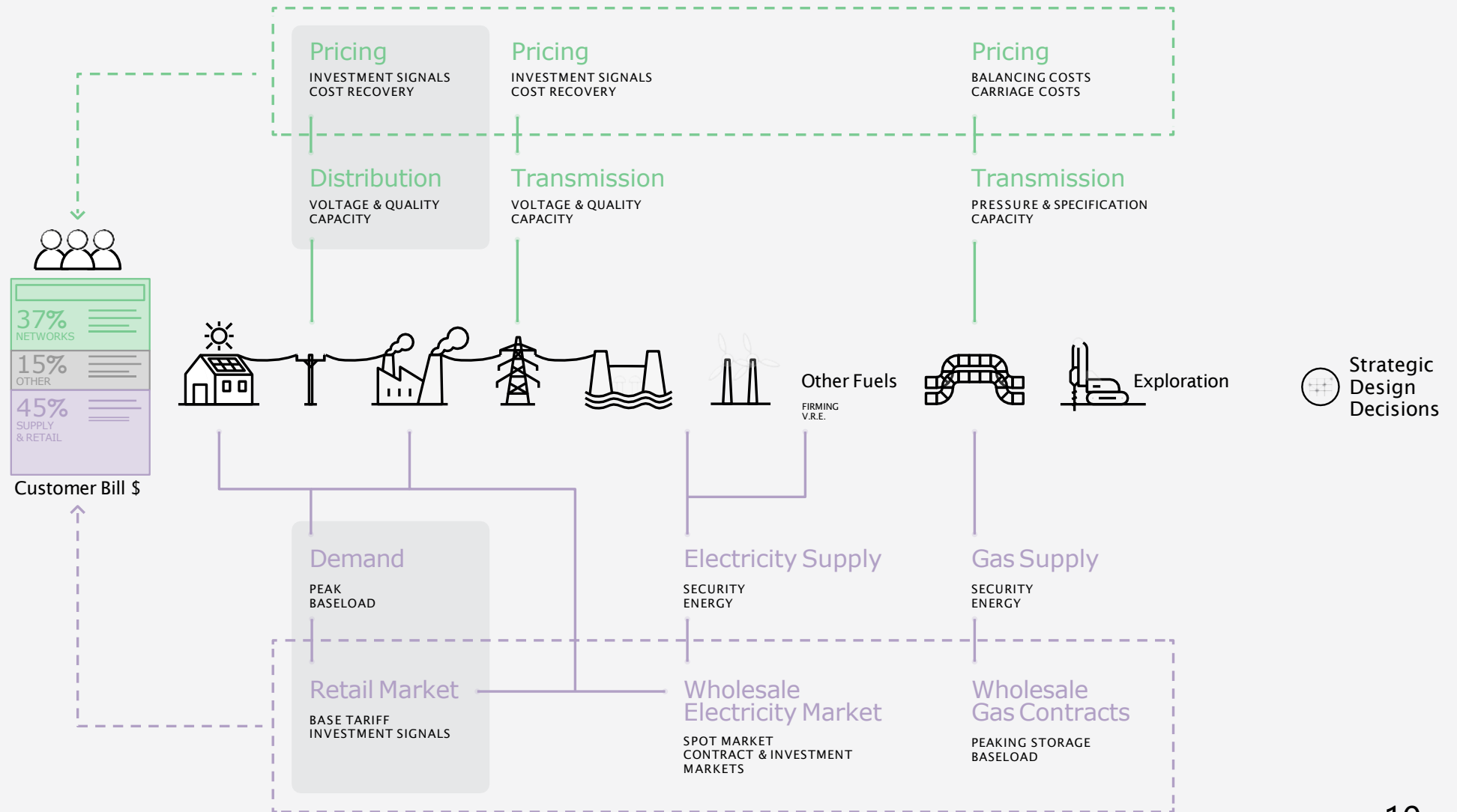
The scale of expected network investment in lines and consumer investment in solar, EVs, and smart technology, driven by the electrification of the economy and new technology that decentralises energy supply, highlights the urgent need for effective economic signalling and coordination. This signalling and coordination is essential to ensure efficient capital allocation, optimise network use, and avoid unnecessary infrastructure spend. This investment could be significantly reduced – by up to \$14B per decade - through enabling a smart, flexible system, especially in the distribution network. This must be a priority for policy and regulation.

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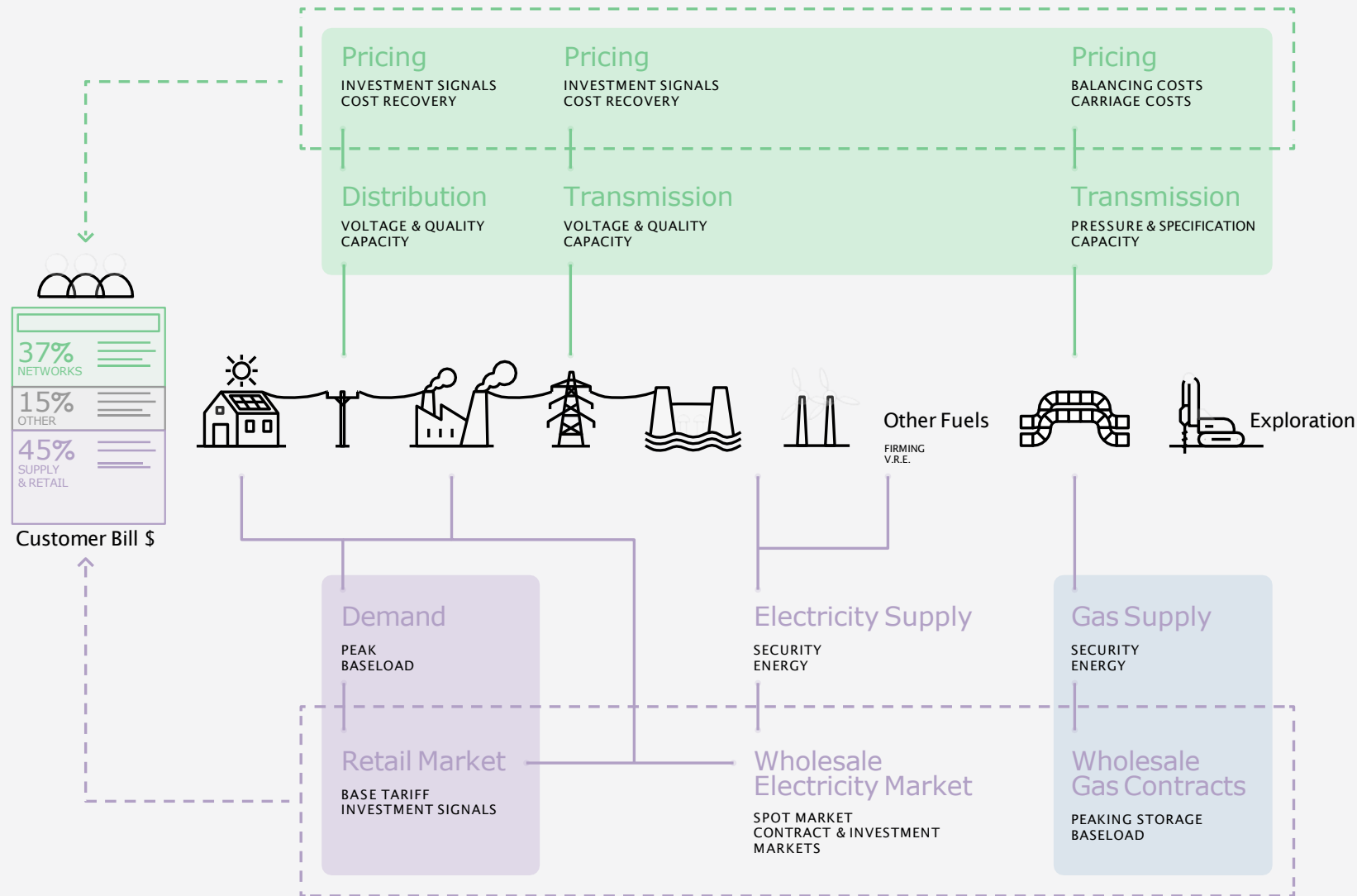
1. Flexibility and Security of Supply
2. Networks and Distributed Energy Resources
3. Consumer Engagement
4. Strategic Assumptions and Design

As consumers gain more options to engage with the market through self-supply and flexibility services, clear and coordinated price signals are essential to drive efficient investment while balancing complexity, consumer preferences, and value sharing. However, getting efficient consumer participation, and ensuring electricity affordability, requires consumer trust, including trust in their agents and industry interfaces.



1. Flexibility and Security of Supply
2. Networks and Distributed Energy Resources
3. Consumer Engagement
4. Strategic Assumptions and Design

Excessive uncertainty in the electricity and gas markets, often driven by inconsistent government policies and a lack of coordinated market design, creates unmanageable investment risks that flow through to higher prices and supply insecurity. To address this, strategic decisions must be informed by broad industry expertise, independent from vested interests and political cycles. However, setting stable platforms for strategic decision making requires enduring, good, government policy.



Conclusion

We note that these issues are also being experienced globally. Notwithstanding that, there is no reason that New Zealand couldn't be a world-leader, as it has before. To achieve this leadership, the significant prize of economic growth and decarbonisation by electrification must be grounded securely in stable policy frameworks, market design expertise and regulatory capability that will see New Zealand embark on its next 25 years of innovation in energy.

Due to the breadth and complexity of the energy system there are some key policy decisions that are required to drive meaningful change. Key decisions that need to be made:

1. How can durability be provided for these key strategic decisions over the long-term, despite political cycles?
2. If some political pressure can always be expected, how does this affect the design choices?
3. Who leads the market design for these key areas, and how are they to be held accountable, given:
 - a. The risks associated with multiple regulators – risks of unintended consequences concentrated in areas of gaps;
 - b. Some of the expertise needed for each area will be outside regulators;
 - c. The need for wide engagement with stakeholders to illuminate unintended consequences and discover innovation?
4. Determine scopes for key strategic questions
 - a. Gas market – can it function stably? Can it support flexible arrangements? If it can't function stably what happens to existing connections and wider infrastructure?
 - b. Security of supply – how to provide assurance that consumer expectations are met and the industry and consumers have certainty that the system is secure?
 - c. How to coordinate DER on distribution networks – the market design, and how does the customer participate?

For further detail please see addendum report

'Understanding the key priorities for the New Zealand electricity industry - Addendum to main summary report'

David Reeve and Stephen Batstone (5 February, 2025)

Acknowledgements

The authors would like to acknowledge Christine Southey for assistance in framing the initial list of issues for the heat map, and guidance on legislative and regulatory mechanisms.

We also acknowledge Studio Unlimited for assistance in developing the industry diagrams, and making them compelling and accessible.

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