

**Gas demand projections to feed into  
the default price-quality path (DPP)  
regulation of gas distribution  
businesses**

**Prepared for the Commerce  
Commission**

**22 August 2025**

  
**concept**

## **About Concept Consulting Group**

*We have been providing useful, high-quality advice and analysis for more than 20 years. Our roots are in the electricity sector and our practice has grown from there. We have developed deep expertise across the wider energy sector, and in environmental and resource economics. We have also translated our skills to assignments in telecommunications and water infrastructure.*

*Our directors have all held senior executive roles in the energy sector, and our team has a breadth of policy, regulatory, economic analysis, strategy, modelling, forecasting and reporting expertise. Our clients include large users, suppliers, regulators and governments. Our practical experience and range of skills means we can tackle difficult problems and provide advice you can use.*

*For more information, please visit [www.concept.co.nz](http://www.concept.co.nz).*

## **Disclaimer**

*Except as expressly provided for in our engagement terms, Concept and its staff shall not, and do not, accept any liability for errors or omissions in this report or for any consequences of reliance on its content, conclusions or any material, correspondence of any form or discussions, arising out of or associated with its preparation.*

*The analysis and opinions set out in this report reflect Concept's best professional judgement at the time of writing. Concept shall not be liable for, and expressly excludes in advance any liability to update the analysis or information contained in this report after the date of the report, whether or not it has an effect on the findings and conclusions contained in the report.*

*This report remains subject to any other qualifications or limitations set out in the engagement terms.*

*No part of this report may be published without prior written approval of Concept.*

© Copyright 2025

Concept Consulting Group Limited

All rights reserved



## Contents

|                 |                                                                                                                     |    |
|-----------------|---------------------------------------------------------------------------------------------------------------------|----|
| 1               | Introduction .....                                                                                                  | 3  |
| 2               | Starting context.....                                                                                               | 4  |
| 2.1.1           | Pipeline demand and revenue splits by consumer and end-use segments .....                                           | 4  |
| 2.2             | Comparison of GDB starting positions .....                                                                          | 4  |
| 3               | Comparison of projections .....                                                                                     | 5  |
| 3.1             | Comparison of projected change in volumes and ICPs.....                                                             | 5  |
| APPENDICES..... |                                                                                                                     | 10 |
| 4               | Methodology for adjusting the GDB projections .....                                                                 | 10 |
| 4.1             | Step 1 – Mapping to consumer segments.....                                                                          | 10 |
| 4.2             | Step 2: Converting GDB-projected totals into consumer segments.....                                                 | 11 |
| 4.3             | Step 3: Converting to YE-Sep values.....                                                                            | 12 |
| 5               | Concept’s demand forecasting methodology and analysis of relative costs of gas and alternatives .....               | 12 |
| 5.1             | Demand forecasting methodology .....                                                                                | 12 |
| 5.2             | Analysis of relative costs of gas versus alternatives for different consumer end-uses .....                         | 13 |
| 5.2.1           | Residential end-use economics .....                                                                                 | 13 |
| 5.2.2           | Industrial process heat economics.....                                                                              | 18 |
| 5.3             | If it is cheaper to switch residential demand than industrial, why is industrial gas demand declining faster? ..... | 19 |

## 1 Introduction

This paper sets out the gas demand and ICP number projections in the spreadsheet file ‘CPRG\_Inputs\_4\_DPP2025\_02’. These projections are intended to feed into the Commerce Commission’s Constant Price Revenue Growth (CPRG) model.

Two sets of projections have been produced:

- 1) ‘GDP’ projections based on data provided by the Gas Distribution Businesses.
- 2) ‘Concept’ projections, produced using Concept’s ‘ENZ’ whole-economy model.

Section 2 sets out some useful starting context, with section 3 then detailing the various projections and highlighting key insights.

Two appendices (sections 4 and 5) detail:

- the methodology used to split the GDB whole-network projections into consumer segment projections; and
- the methodology used develop Concept’s projections, with sub-section 5.2 also setting out detailed analysis of the relative economics of gas versus alternatives for providing heating services to consumers.

Note:

- All projections in this report are on a year-ending September basis, except where explicitly specified.
- 2024 is the last year of actual data, with years 2025+ being projections

## 2 Starting context

This section sets out some useful starting context in terms of:

- The split between consumer segments in terms of pipeline demand and revenue (this being an aggregate split across all four GDBs)
- Differences between GDBs in terms of scale and consumer composition.

### 2.1.1 Pipeline demand and revenue splits by consumer and end-use segments

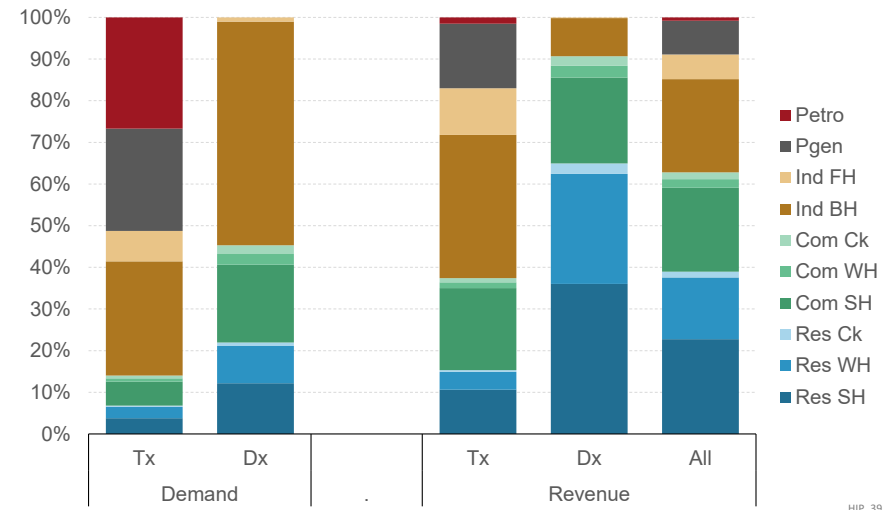
Figure 1 shows the estimated proportional split of gas demand and contribution to pipeline revenue, among the main consumer segments and end-uses:

- Petrochemicals
- Power generation
- Industrial process heat, differentiating between boiler heat (BH) and high-temperature 'furnace heat' (FH)
- Residential (Res) and Commercial (Com) differentiating between space heating (SH) water heating (WH) and cooking (CK)

It also differentiates between volumes/revenues on the transmission network (Tx) and distribution networks (Dx).

The key take-away from Figure 1 is that distribution pipeline revenue is dominated by Residential space heating and Residential water heating. Accordingly, the future economic viability of the gas distribution networks depends on the continued significant use by Residential consumers for gas to heat their homes and provide hot water.

**Figure 1: Sectoral split of gas demand and contribution to pipeline revenue**



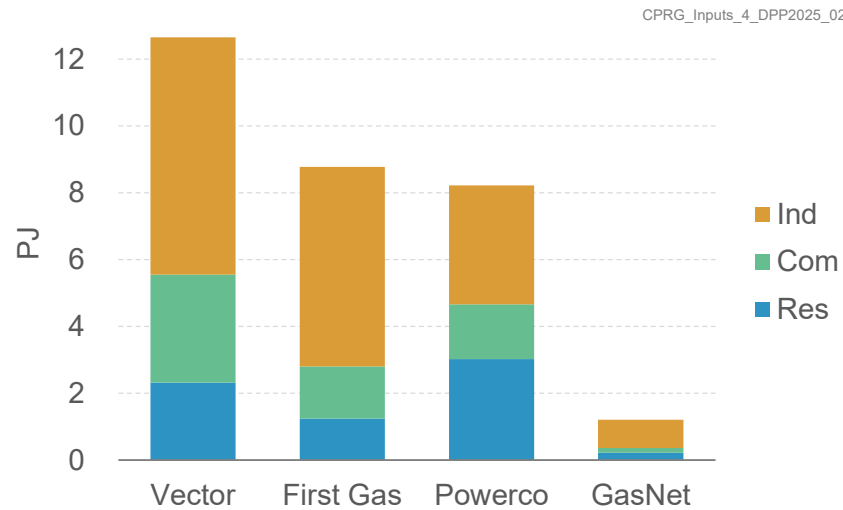
Source: Concept analysis drawing upon MBIE, Commerce Commission, First Gas, and EECA data

### 2.2 Comparison of GDB starting positions

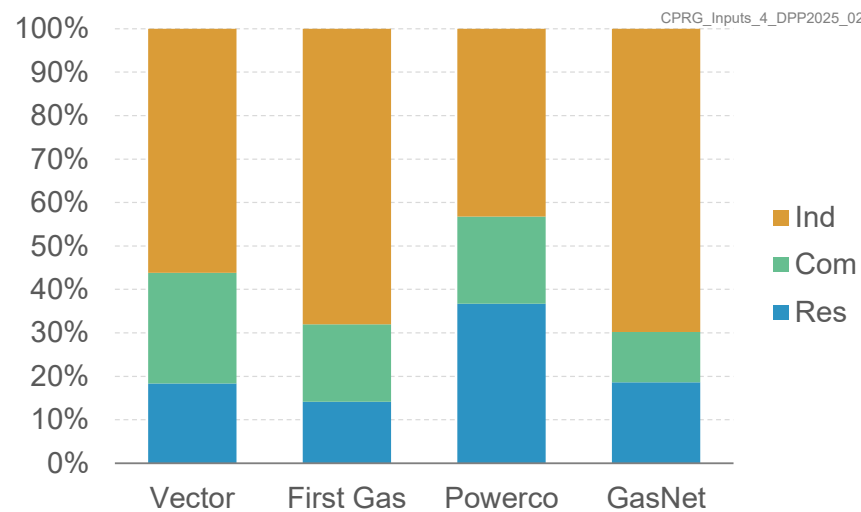
Figure 2 and Figure 3 below show that, in terms of TJ volumes:

- In comparison to Vector, GasNet is 1/10<sup>th</sup> the size, with First Gas and Powerco being approximately 2/3 the size
- Powerco has approximately twice the proportion of residential consumers than the other GDBs.

**Figure 2: GDB segment volumes for 2024**



**Figure 3: GDB proportional segment volumes for 2024**



### 3 Comparison of projections

This section compares the various projections between the GDBs and Concept.

#### 3.1 Comparison of projected change in volumes and ICPs

In the graphs below, a 'GDB' label indicates the projection was produced by a GDB, whereas a 'Concept' label indicates it was produced by Concept.

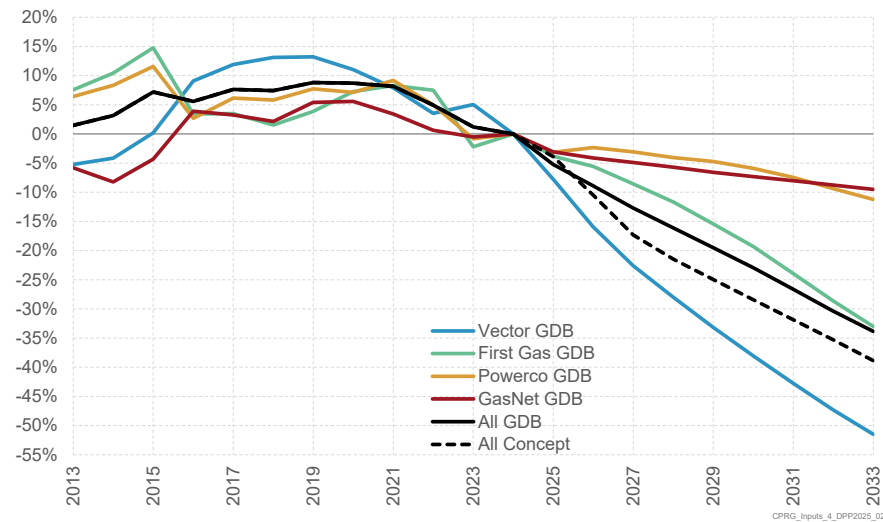
A label of 'All' indicates that the projection refers to the demand or ICP-weighted average across all four GDBs.

Figure 4 and Figure 5 below show projected changes in total demand and ICPs produced by the GDBs and Concept.

The key take-aways from the graphs are that:

- All GDBs, plus Concept are projecting declines in both total demand and ICP numbers
- In aggregate across all GDBs, Concept's total demand projections are broadly in line with the aggregate of the GDBs' projections, but Concept is projecting a greater decline in ICP numbers
- There is a reasonable degree of variation between GDBs in terms of change in total demand and ICP numbers

**Figure 4: Movement in Total Demand relative to 2024**



**Figure 5: Movement in Total ICPs relative to 2024**

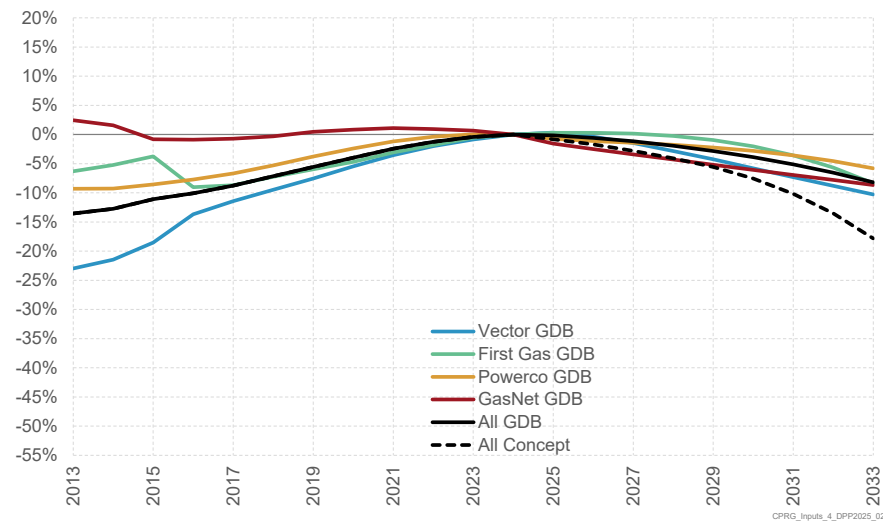


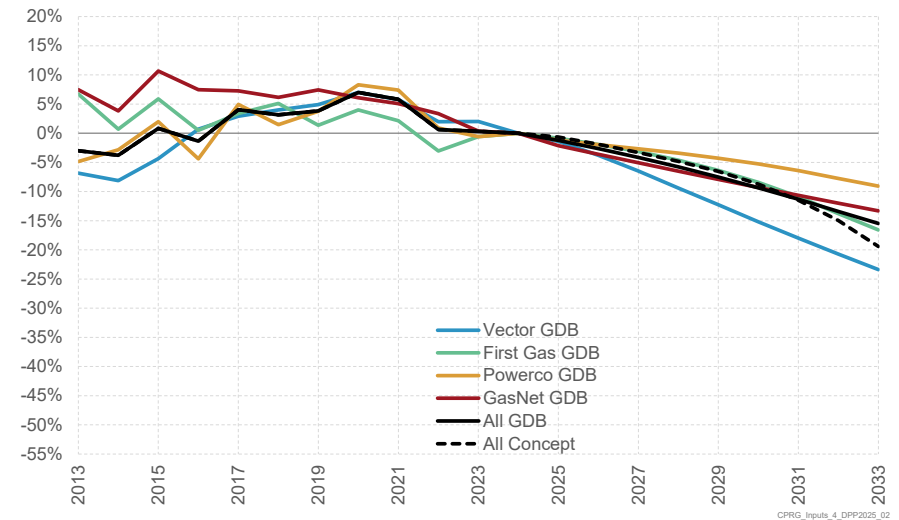
Figure 6 to Figure 8 below show the projected movement in demand for the Residential, Commercial, and Industrial segments, respectively.

In aggregate across all GDBs, they show a reasonable degree of consistency between Concept's projections and those of the GDBs

However, there is some variation between the GDBs: Vector is projecting the fastest decline in each consumer segment, followed by First Gas. Powerco is forecasting the smallest decline for each of the consumer segments.

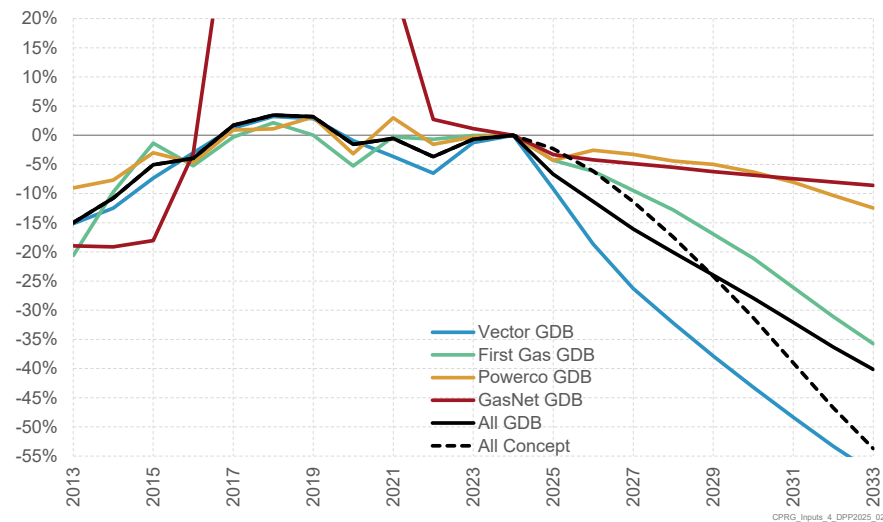
Another key take-away is that projections generally show an accelerating rate of demand reduction – particularly for Residential demand – but with the Concept projections having the highest rate of acceleration.

**Figure 6: Movement in Residential Demand relative to 2024**





**Figure 7: Movement in Commercial Demand relative to 2024**



**Figure 8: Movement in Industrial Demand relative to 2024**

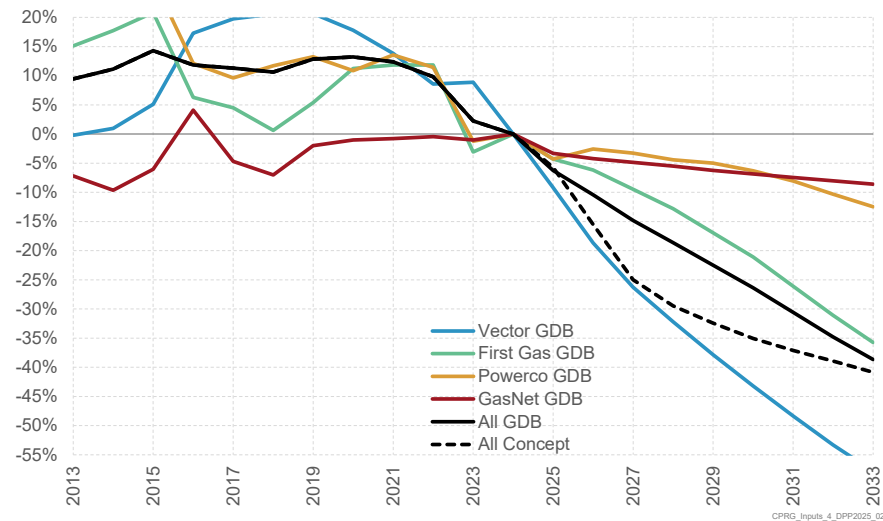
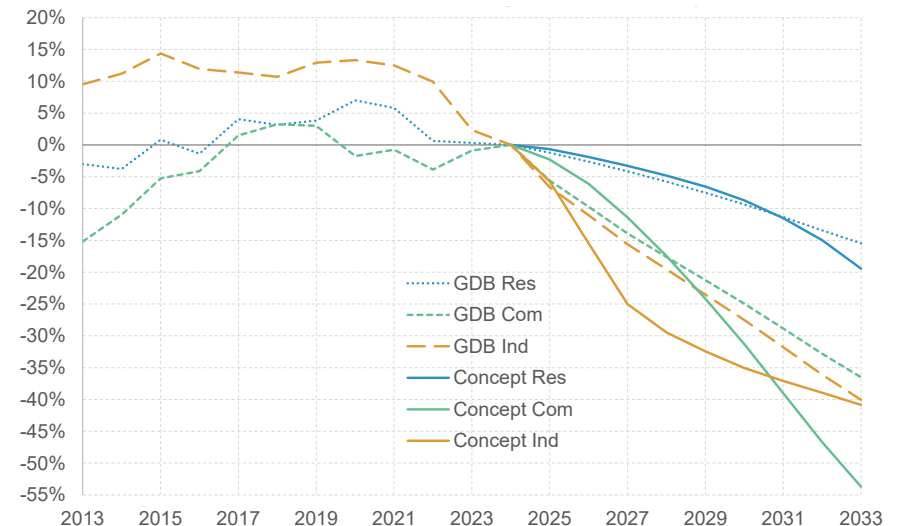


Figure 9 to Figure 13 below show the relative movement in demand between the Consumer segments on a whole-of-NZ basis (Figure 9) and for each GDB (Figure 10 to Figure 13)

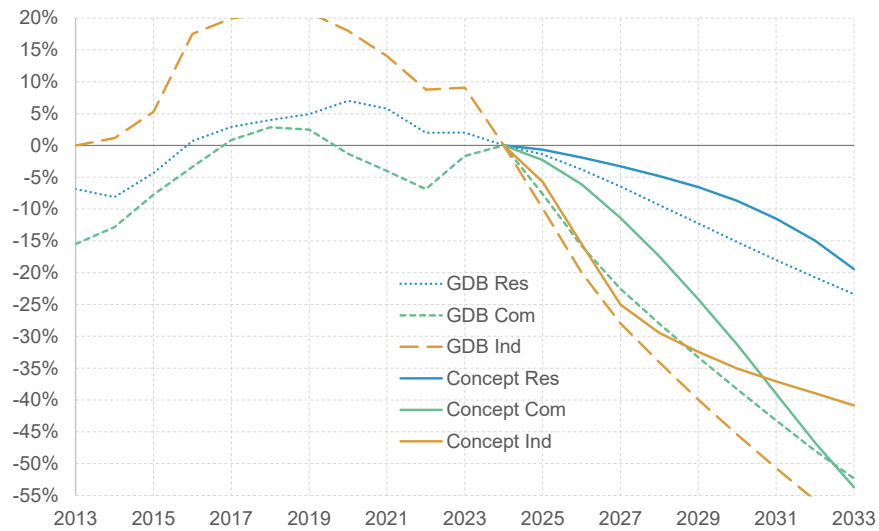
The key take-away from this analysis is that Concept, Vector, and FirstGas are projecting much slower rates of decline for Residential demand relative to Commercial and Industrial, whereas Powerco and GasNet are projecting broadly similar rates of decline across all three consumer segments. (GasNet is even projecting faster decline among Residential consumers than the other segments).

**Figure 9: Demand movement across all GDBs relative to 2024**

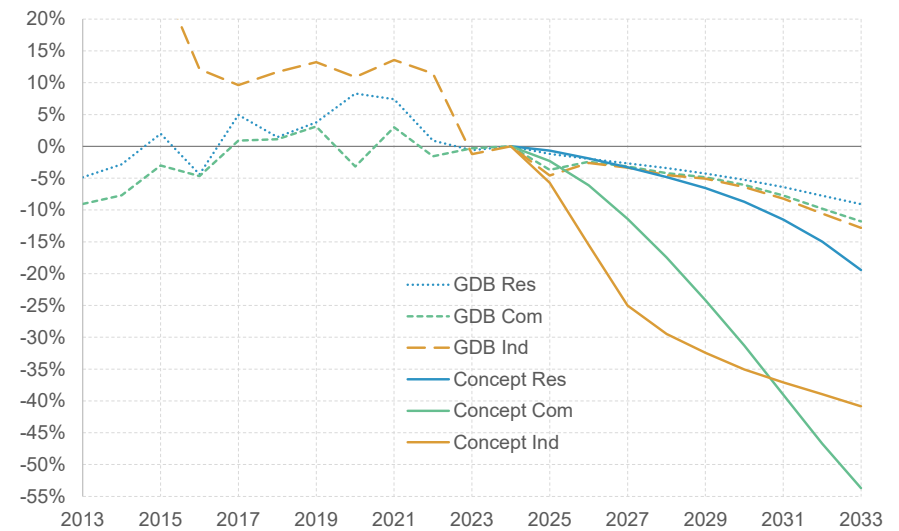




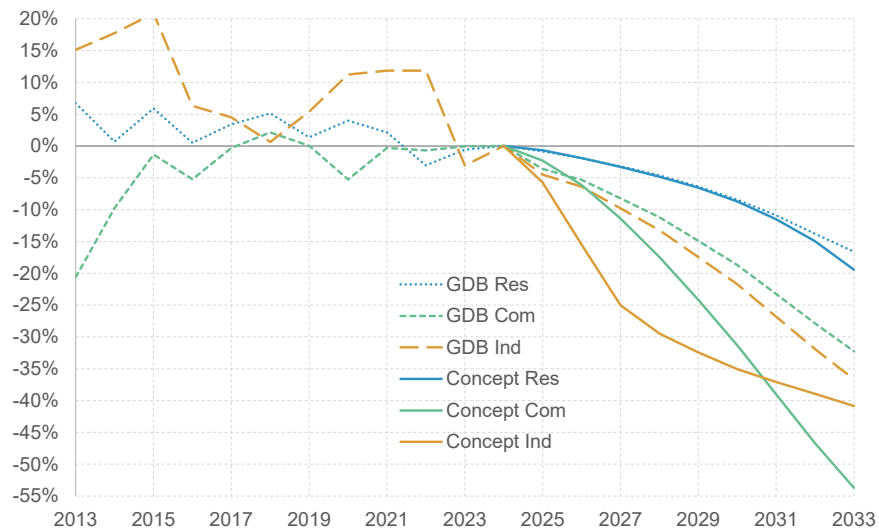
**Figure 10: Demand movement for Vector relative to 2024**



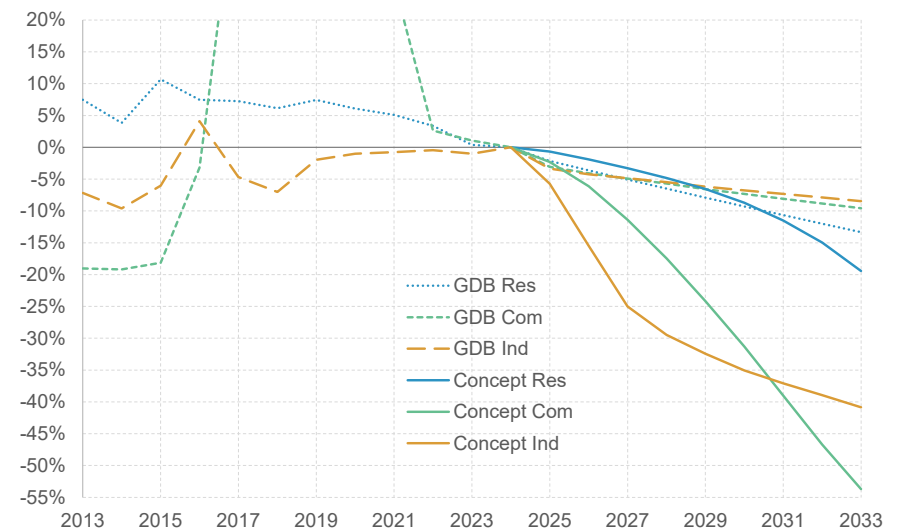
**Figure 12: Demand movement for Powerco relative to 2024**



**Figure 11: Demand movement for First Gas relative to 2024**



**Figure 13: Demand movement for GasNet relative to 2024**

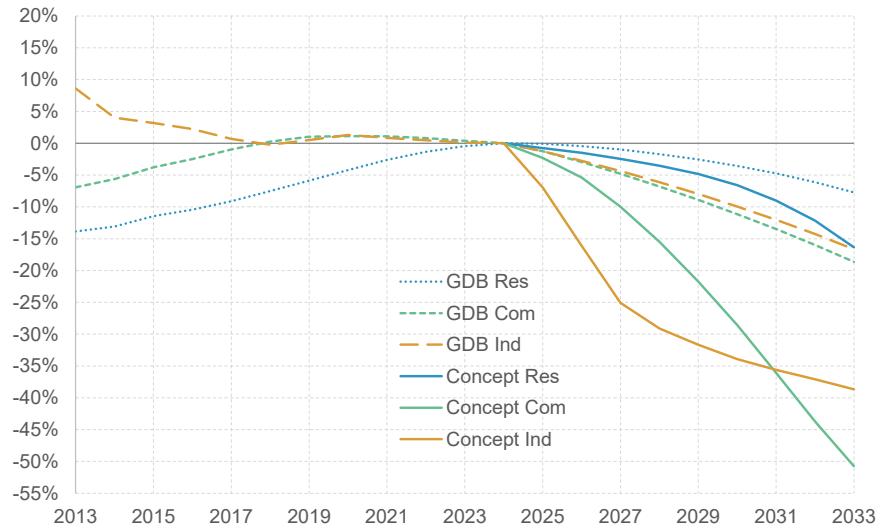






Projecting slower rates of reduction for the Residential consumer segment is consistent with historical movements in segmental demand (as shown previously in Figure 9) and ICP numbers (as shown in Figure 14 below).

**Figure 14: ICP numbers movement for all GDBs relative to 2024**



However, this is despite it generally being significantly more cost-effective for Residential consumers to switch away from gas compared to Industrial consumers – as demonstrated in the analysis detailed in section 5.2 in the Appendices.

## APPENDICES

### 4 Methodology for adjusting the GDB projections

The GDB data was based on:

- data supplied by three of the GDBs to the Commission specifically for this exercise; plus
- data from schedule 12c from the latest Asset Management Plans where such data was not provided to the Commission.<sup>1</sup>

The data provided by the GDBs was only in the form of aggregate total TJ demand and total ICPs.

However, this data needed to be split into three consumer segments (Residential, Commercial, and Industrial) for the purposes of feeding into the Commission's CPRG model. This was achieved via the following steps:

#### 4.1 Step 1 – Mapping to consumer segments

Firstly, mapping was undertaken which assigned each of the Consumer Charge categories reported by the GDBs in Schedules 8 and 9 of the Information Disclosures to a consumer segment: Residential, Commercial, and Industrial.

The reported demands and ICPs for each disclosure year were then summed for each of these categories.

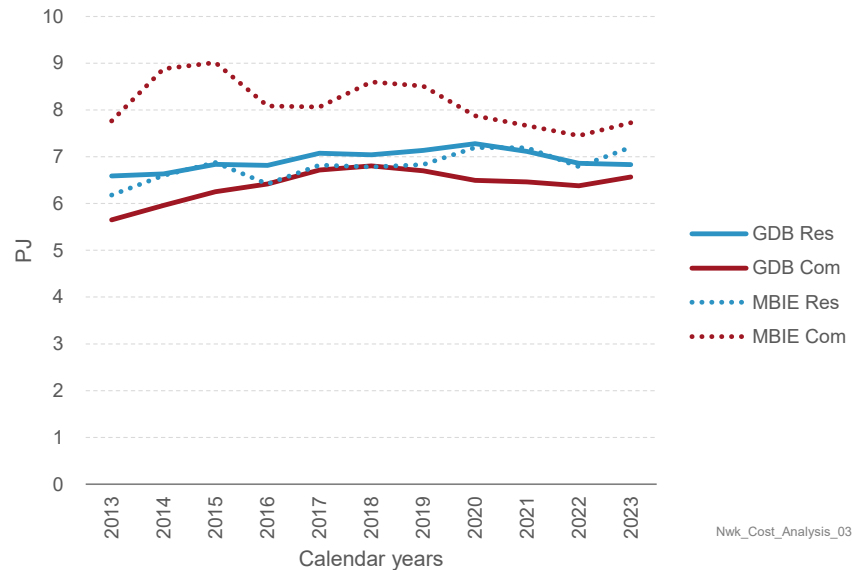
In some cases, there is not a one-to-one mapping for some consumer categories. Eg, GasNet's M6 category covers Residential plus some Small Commercial. This M6 category has been assigned to a 'Res' category for this aggregation purposes. A sanity check of aggregate volumes for each category was compared with reported MBIE volumes – noting that calendar year conversions for each of the GDB volumes needed to be undertaken. This is shown in Figure 15 below. This indicates a good mapping for Residential, but not quite as good for Commercial, with some consumers that MBIE reports as Commercial being treated as Industrial for this process. This is considered to be sufficient for the purposes given that:

- Residential is by far the most important category in terms of revenue recovery, with Figure 1 previously indicating that the relative proportions of revenue recovered by Res/Com/Ind for the most recent reported year are: 65%, 21% and 14% respectively.
- The weighted-average price cap approach requires consistency across years, and so differences in classification between those criteria used by MBIE and those for the GDBs pricing purposes, shouldn't affect price control outcomes, provided consistency is maintained across years.

---

<sup>1</sup> AMP data was used for all of GasNet's data, plus Vector for ICP numbers as these were not supplied. AMP projections only extend to FY30, so projections for the three years beyond that were created assuming the rate of change projected by the GDBs for FY29 to FY30. In addition to using AMP data in some cases, it was apparent that FirstGas' ICP projections were short by approximately 5,000 ICPs. Accordingly, the FY25 projection was based on the FY24 actual values, factored by the average relative change between FY23/FY24 and FY24/FY 25, and then using the projected rates of change for all subsequent years.

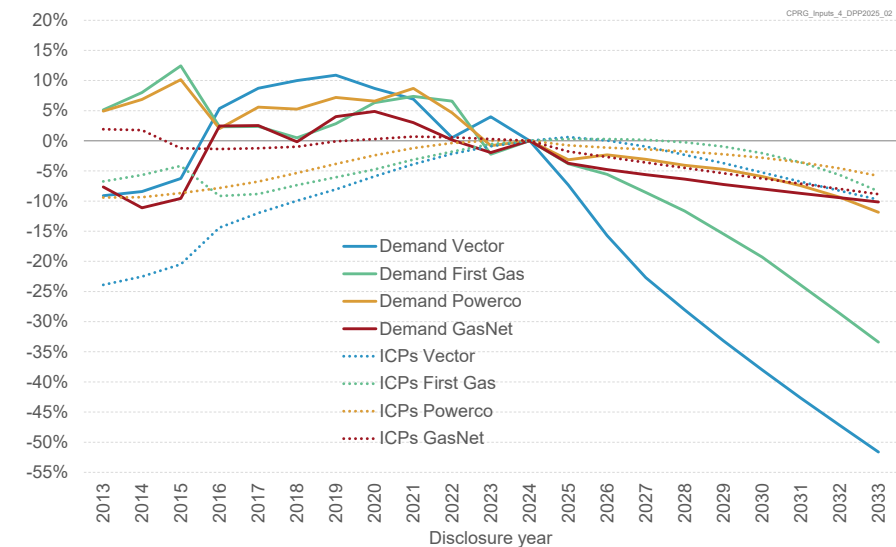
**Figure 15: Comparison of MBIE segment volumes with ID-derived segment volumes (calendar years)**



## 4.2 Step 2: Converting GDB-projected totals into consumer segments

As illustrated in Figure 16, the GDBs projections are indicating a significantly greater proportional fall in demand than in ICP numbers. This is indicative of a much greater rate of fall in demand from industrial consumers than mass-market consumers. It therefore requires applying differential rates of change for the derived consumer segments.

**Figure 16: Difference in demand and ICPs relative to 2024**



To achieve this:

- Projections of demand per ICP were derived for residential consumers – being the most recent reported value for the 2024 disclosure, and projected forward at the rate of change of demand per ICP observed over recent years
- This demand was multiplied by the projected ICPs from the GDBs – assuming that Residential ICP numbers would move in line with the aggregate projection in ICP numbers from the GDBs. (Noting that Residential consumers account for approximately 96% of all ICPs).
- The Commercial and Industrial demand values were derived as being the difference between the GDB projected total demand and the projected Residential demand, with the rate of decline of Commercial consumers being weighted 80% to the rate of decline in this aggregated Commercial + Industrial volume and



20% to the rate of decline of Residential demand. I.e, it was assumed that the rate of decline of Commercial would fall between that of Industrial and Residential consumers, but more closely aligned to that of Industrial consumers.

### 4.3 Step 3: Converting to YE-Sep values

Because the Information Disclosure reporting years vary between GDBs (YE-Jun for Vector and GasNet, YE-Sep for FirstGas and Powerco), factors were applied to the Vector and GasNet projections to convert the YE-Jun projections to YE-Sep values.

## 5 Concept's demand forecasting methodology and analysis of relative costs of gas and alternatives

### 5.1 Demand forecasting methodology

Concept's gas demand forecasts were produced using its whole-economy model, 'ENZ'. In addition to many other pieces of functionality relating to land-use change, changes in transport, etc, ENZ undertakes national level forecasts of energy-consumption split by fuel and activity.

ENZ uses the most recent historical actual values split by consumer segment and end-use as reported by MBIE and EECA as a starting basis, and projects the future demand for gas (and other fuels) based on the following methodology:

- Project the change in demand for the underlying energy service, eg, space heating, water heating, cooking, process heat.

This is principally driven by projections of future changes in population (for Residential and some proportion of Commercial demand) and GDP (for Industrial demand).

- Project the extent to which energy efficiency improvements will reduce the quantity of input energy needed to provide the energy service.

These are fundamentally driven by exogenous assumptions – informed by observed historical changes in energy intensity and various stated government objectives.

In the case of space and water heating, these are also based on a model of the change in the building stock over time, with new-builds, renovations, and building replacements separately modelled, each with their own assumptions as to their relative energy intensity.

- Project the extent to which different fuel choices meet the demand for heating.

This is based on modelling of the relative economics to consumers of the different fuel options, given projections of (endogenously modelled) fuel prices and (exogenously projected) appliance costs and efficiencies. This modelling seeks to take account of the key different consumer situations, including new-build properties, existing appliances, and end-of-life appliances. Section 5.2 below provides a more detailed breakdown of these comparisons for Residential and Industrial consumers.

Notwithstanding this detailed modelling of the economics of the different fuel options, it should be noted there is significant inherent uncertainty regarding how consumers will respond to changes in the relative prices of the fuel options. Observed consumer behaviour appears to indicate significant non-price factors driving fuel choice decisions, including: perceptions of perceived quality variations between fuels; the 'hassle factor' associated with fuel switching; and environmental sentiments. 'S-curve' type switching functionality<sup>2</sup> with scenario-based sensitivity factors attempts to capture this range of uncertainty.

## **5.2 Analysis of relative costs of gas versus alternatives for different consumer end-uses<sup>3</sup>**

This section details the economics of switching from gas to electricity for residential and industrial consumers.

---

<sup>2</sup> This s-curve functionality projects a relatively small proportion of the population will switch from fuel choice 'A' to 'B' when the economics are marginally in favour B. The proportion will steadily increase as the economics move ever more in favour of B, before the rate of switching with improvement in economics tailing off again. ie, there will be some consumers who exhibit great reluctance to switch, even in the face of apparently compelling economics.

<sup>3</sup> The analysis in this section is a small extract from Concept's 2025 gas market outlook report – due to be completed and available for purchase in September.

### **5.2.1 Residential end-use economics**

To evaluate the likelihood of residential consumers switching away from gas, Figure 17 to Figure 24 below shows the estimate lifetime cost breakdowns (ie, including amortisation of appliance capital costs) for delivering useful heat (ie, taking account of appliance efficiency) for gas appliances compared with electricity appliances – both heat pump (HP) and resistance heating (Resist).

Whether gas or electric is the cheapest options is very situation specific, depending on factors such as the size of the heat load (noting that a large heat load results in more cost-effective recovery of appliance capital costs and fixed network charges), and new-build versus existing-gas-appliance situations (noting that the capital cost of an existing gas appliance is sunk, and only the present value of its eventual replacement with another gas appliance when it reaches the end of its life should be taken into account. Accordingly, a large number of different graphs are shown for the space heating and water heating situations, differentiating between size of heat load and between new-build versus existing-gas-appliance situations.

For reference, while from an ICP numbers basis the split between Small/Medium/Large is 33%/33%/33%, from a TJ volume basis, the split is 16%/30%/54%.

The key take-aways from the graphs are:

- Electricity is already a significantly cheaper option than gas for new-build situations for both space and water heating – and with this difference growing over time.



- It is already generally cost effective to switch away from gas for water heating – and projected to get even cheaper over time.
- It is sometimes currently cost effective to switch away from gas space heating to electric, but in many cases it is not, with significant variation according to the size of the consumer's heat load, and the specifics of the switch in terms of the extent of 'made-good' costs associated with removing the gas heating appliance and the extent of any electricity network upgrades. However, it is projected to get progressively more cost-effective to switch away from gas for space heating over time.

This analysis highlights the following key issues facing gas demand for providing space and water heating:

- Consumers (and, ultimately, NZ Inc) can avoid gas network and retail costs from switching to electricity, whereas the significant majority of electricity lines costs and all retail costs will not increase from switching to electricity

That said, electricity tariff structures are not currently fully cost-reflective and thus suppress the price signal to consumers to some extent. However, due to regulatory and competition pressures, it is expected that electricity tariffs to consumers will become increasingly cost-reflective. For instance, the removal of the low-fixed charge regulations will help remove the artificial disincentive against switching to electric options arising from the recovery of fixed network and retail/metering costs via variable charges.

- The economic challenge for gas heating is particularly acute for houses that only have gas for water heating households, as fixed network and retail costs can't be spread over more than one end-use. In this respect, it is estimated that less than half of households that have gas, use it for space heating.

Furthermore, the flat within-year profile and controllability of electric water heating results in very low electricity network costs.

- For new-build situations, electricity space and water heating is already cheaper than gas, even without a cost of carbon. Plus,
  - electricity delivers a superior service for space heating (through offering summer space cooling)
  - large, exterior, mains pressure cylinders now offer an equivalent service for water heating

- For houses with existing gas appliances, the inherent advantage associated with continuing with gas significantly reduces at times when appliances need replacing or if significant home renovation is anyway occurring.

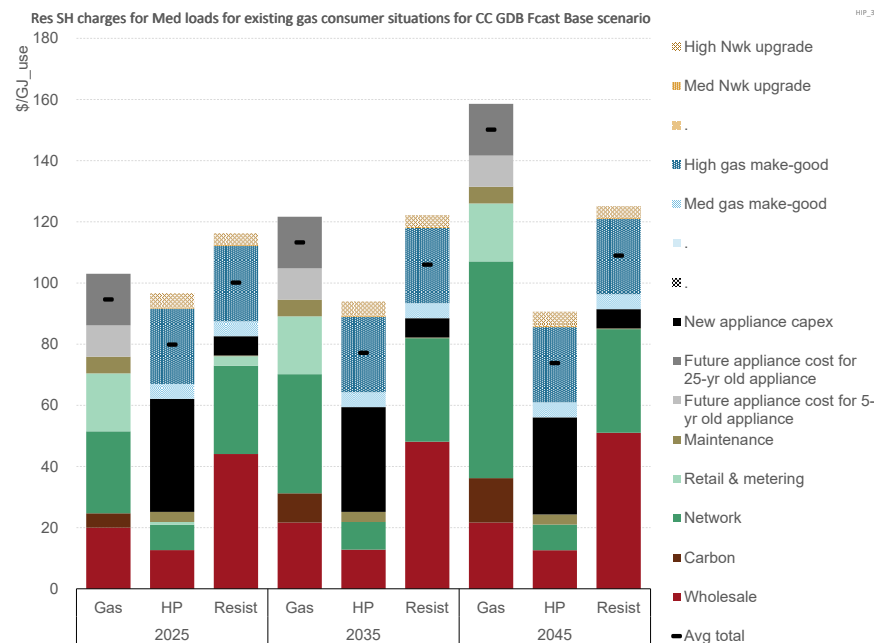
The potential for high make-good costs from removing a gas appliance and (occasionally) network upgrades will assist gas space heating economics, but largely doesn't feature for water heating

- Several headwinds for gas space & water heating will likely grow over time
  - Growing carbon costs and commodity price of wholesale gas. The commodity component is significantly uncertain due to major uncertainties in the wholesale gas market. It is potentially the case it could rise faster than is indicated in the graphs if New Zealand were to move to importing LNG (and the associated, much higher wholesale costs).
  - Increasing cost-reflectivity of electricity tariff structures due to regulatory and competitive pressures
  - Ongoing cost and performance improvements in electric heat pumps

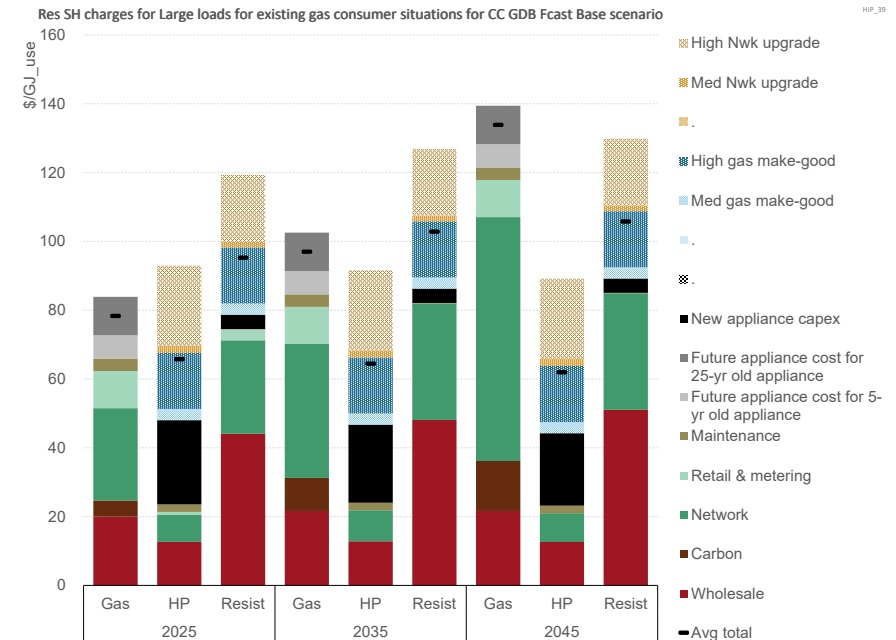
- Declining pipeline demand leading to pipeline price increases for remaining consumers – the so-called ‘death-spiral’, as illustrated in the graphs showing the network cost component for the gas options rising over time

Because so-called ‘green gases’ (bio-methane or green hydrogen) are even more expensive than LNG, it is considered that green gases do not alter the fundamental conclusion that providing space and water heating services using electricity will be the least-cost option for an ever-growing number of households and, ultimately, NZ Inc.

**Figure 17: Residential space heating cost breakdown comparison for medium heat loads for existing gas consumers**

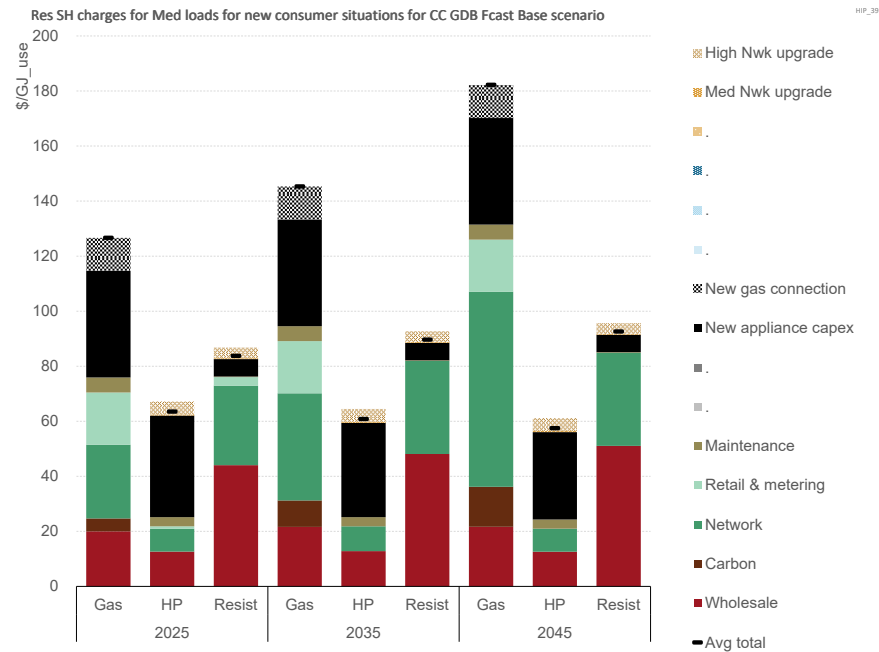


**Figure 18: Residential space heating cost breakdown comparison for large heat loads for existing gas consumers**

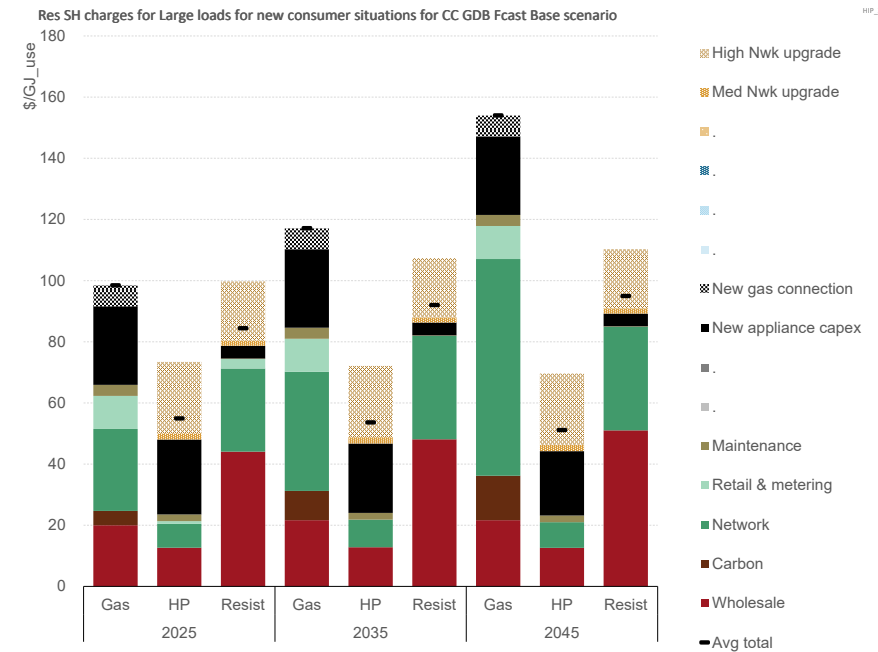




**Figure 19: Residential space heating cost breakdown comparison for medium heat loads for new-build situations**

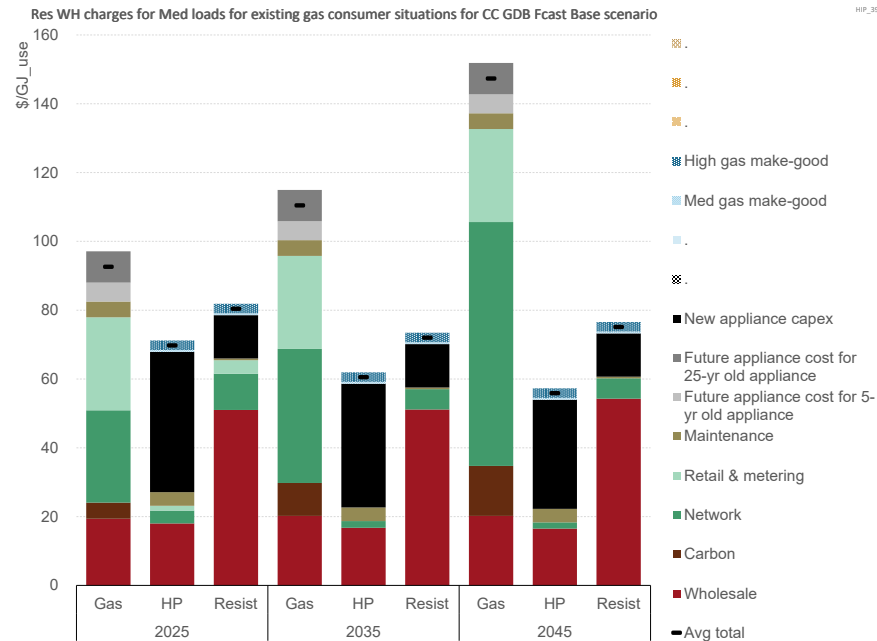


**Figure 20: Residential space heating cost breakdown comparison for large heat loads for new-build situations**

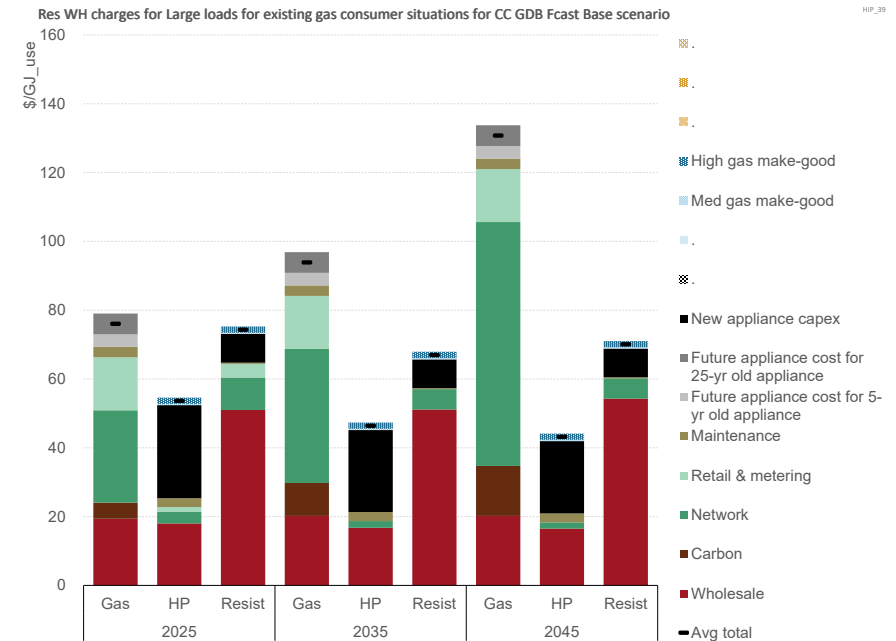




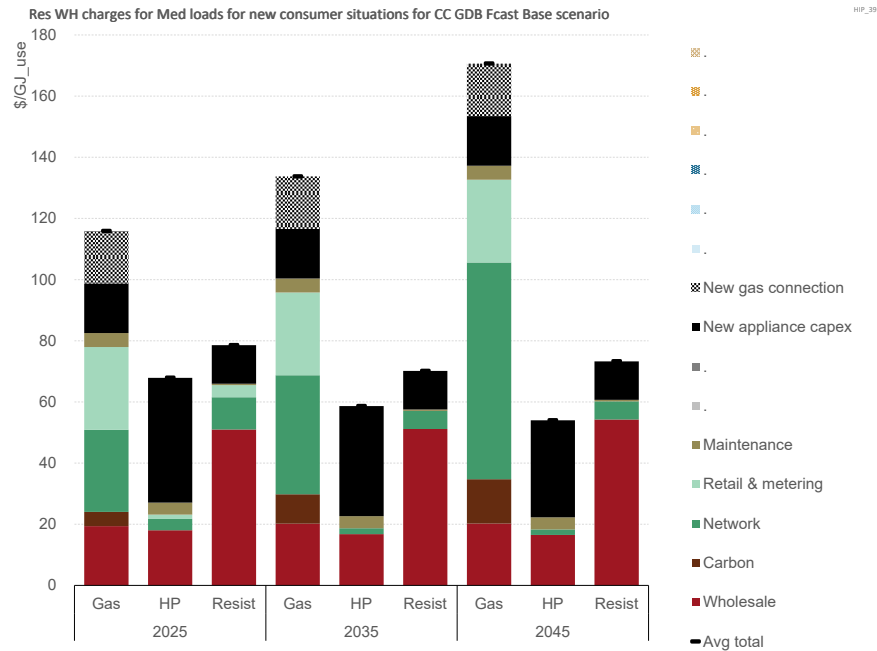
**Figure 21: Residential water heating cost breakdown comparison for medium heat loads for existing gas consumers**



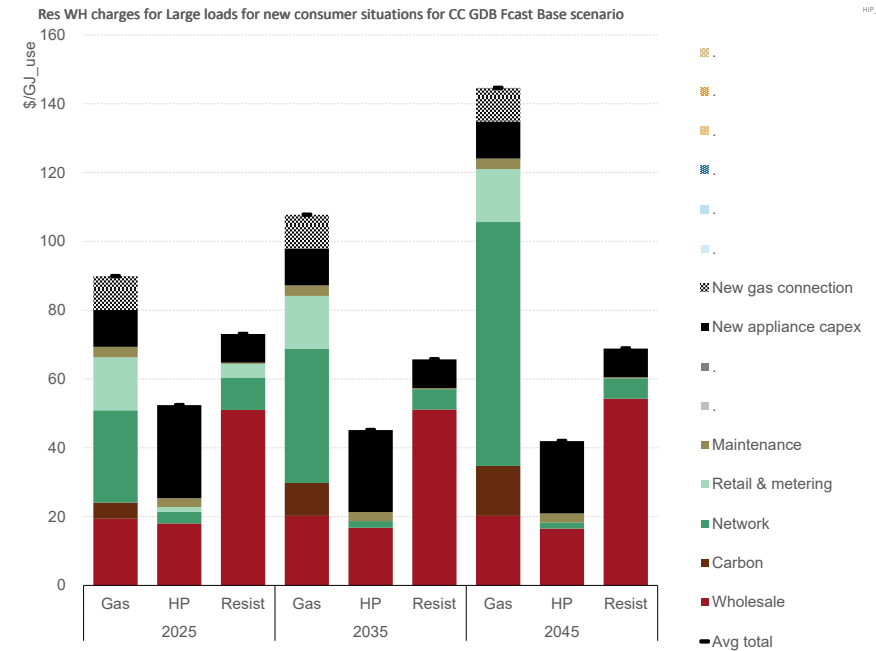
**Figure 22: Residential water heating cost breakdown comparison for large heat loads for existing gas consumers**



**Figure 23: Residential water heating cost breakdown comparison for medium heat loads for new-build situations**



**Figure 24: Residential water heating cost breakdown comparison for large heat loads for new-build situations**



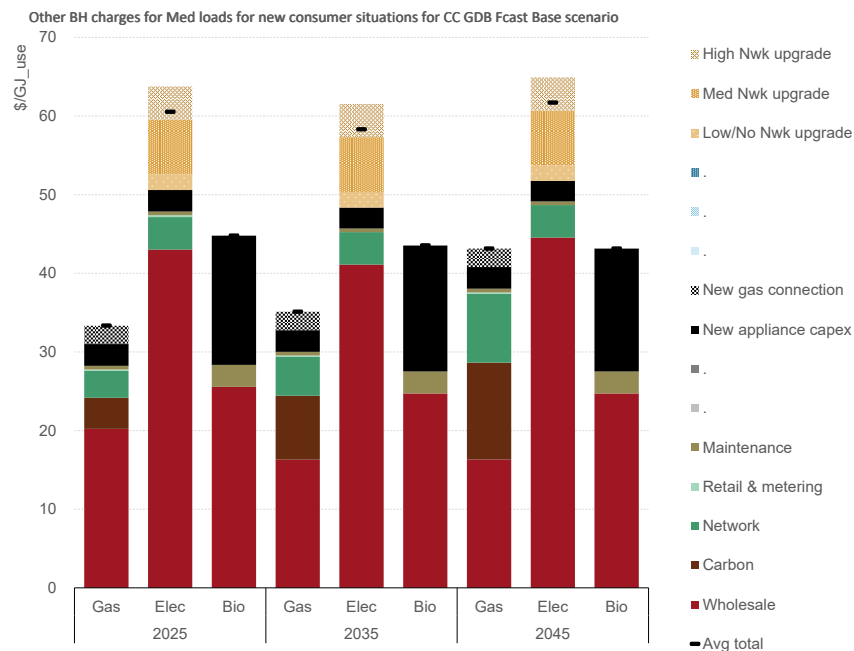
## 5.2.2 Industrial process heat economics

Figure 1 on page 4 at the start of this report indicates industrial demand<sup>4</sup> is predominantly to provide boiler heat for low-to-intermediate heating purposes, but also a variety of high-temperature uses (eg, in the production of steel, cement, and glass) we colloquially refer to as ‘furnace heat’.

<sup>4</sup> In this report we refer to ‘industrial’ consumers as all industrial consumers except petrochemical consumers. We include ‘Agricultural’ users as industrial, as demand in this segment is dominated by a relatively small number of horticultural businesses using gas heating for hot houses.

As shown by comparing Figure 25 below with the equivalent figures for residential heating above, it is generally significantly more costly to switch away from gas to low-carbon alternatives for industrial boiler heat than it is for residential and commercial. The required carbon prices to make such industrial switching economic are significantly greater than current expectations of ETS prices.

**Figure 25: Industrial process heat cost breakdown comparison for medium heat loads for existing gas consumers**



That said, most large industrial consumers have committed to progressively transitioning away from gas to lower-carbon alternative fuels such as electricity and solid biomass. As well as domestic considerations, some of this is due to pressures from overseas consumer groups requiring commitments from suppliers that they are moving to low-carbon production.

Further, increasing non-carbon gas prices due to declining NZ gas availability will lower the effective carbon price where it becomes cost-effective to switch away from gas plus, declining gas demand (both industrial and residential/commercial) will steadily increase pipeline charges to industrial gas consumers.

### 5.3 If it is cheaper to switch residential demand than industrial, why is industrial gas demand declining faster?

Although it is generally more cost-effective for Residential consumers to switch away to gas, in a constrained supply situation (as is currently the case) where there is insufficient gas to meet demand, it is generally much cheaper to curtail demand for industrial consumers than residential consumers. This is because of the significant costs associated with re-pressurising gas to residential suburbs compared to individual industrial consumers.

It is in large part for this reason that industrial consumers are the principal segment currently finding it hard to get supply when their contracts with suppliers runs out. As such, faced with the prospect of uncertain supply, many industrial consumers are actively seeking to switch away from gas.

Additionally, many industrial gas consumers (albeit not those facing competition from overseas suppliers of the product they produce) are able, over-time, to pass-on the cost of increased energy supply to the consumers of the products they produce. In contrast, residential consumers have no such ability. This ability for some industrial consumers to pass-on increased costs of energy will also help explain why industrial gas demand is declining faster than residential demand.