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## **Pricing Methodology for Gas Distribution Services**

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**23 August 2012**

## **FOREWORD**

This document presents Powerco's pricing methodology for gas distribution services for the 2012/13 pricing year. It has been prepared in accordance with the requirements of the Commerce Act (Gas Distribution Services Input Methodologies) Determination 2010 and the Commerce Act (Gas Distribution Services Information Disclosure) Determination 2012.

In brief, this document contains a summary of the factors that Powerco considered when developing its pricing strategy and pricing methodology, an overview of the cost allocation process, Powerco's 2012/13 target revenue and the allocation of that revenue and its medium term pricing strategy.

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## COMMONLY USED TERMS IN THIS REPORT

Term	Definition
Demand	A term used to denote the peak consumption of gas.
Gas consumer / gas customer	This report uses the term “consumer” when discussing the general characteristics of consumers of natural gas in the New Zealand market; “customer” specifically refers to a party who is connected to Powerco’s gas network and to whom Powerco provides gas distribution services.
GDB	Gas distribution business.
Gigajoule (GJ)	A measure of the energy content of gas. Residential gas tariffs often measure gas energy usage in terms of equivalent kilowatt hours (kWh); however, Powerco measures gas consumption in terms of gigajoules.
ICP	Installation control point or individual connection to the gas network. The term ICP is used to denote a specific gas customer.
Load group	A category of Powerco distribution customer, with a defined capacity and annual consumption that is subject to a specific distribution tariff.
Mass market	Load groups to which standard, published tariffs apply; the bulk of Powerco’s customers are considered mass market. By contrast, non-standard customers have special requirements and individual pricing arrangements.
Standard cubic meters per hour (scmh)	Flow rate of natural gas through a pipeline or a meter. The “standard” refers to the temperature and pressure conditions under which the flow rate is measured.
Volume	Term used to denote consumption over a period of time, such as a day or a year.

# 1. EXECUTIVE SUMMARY

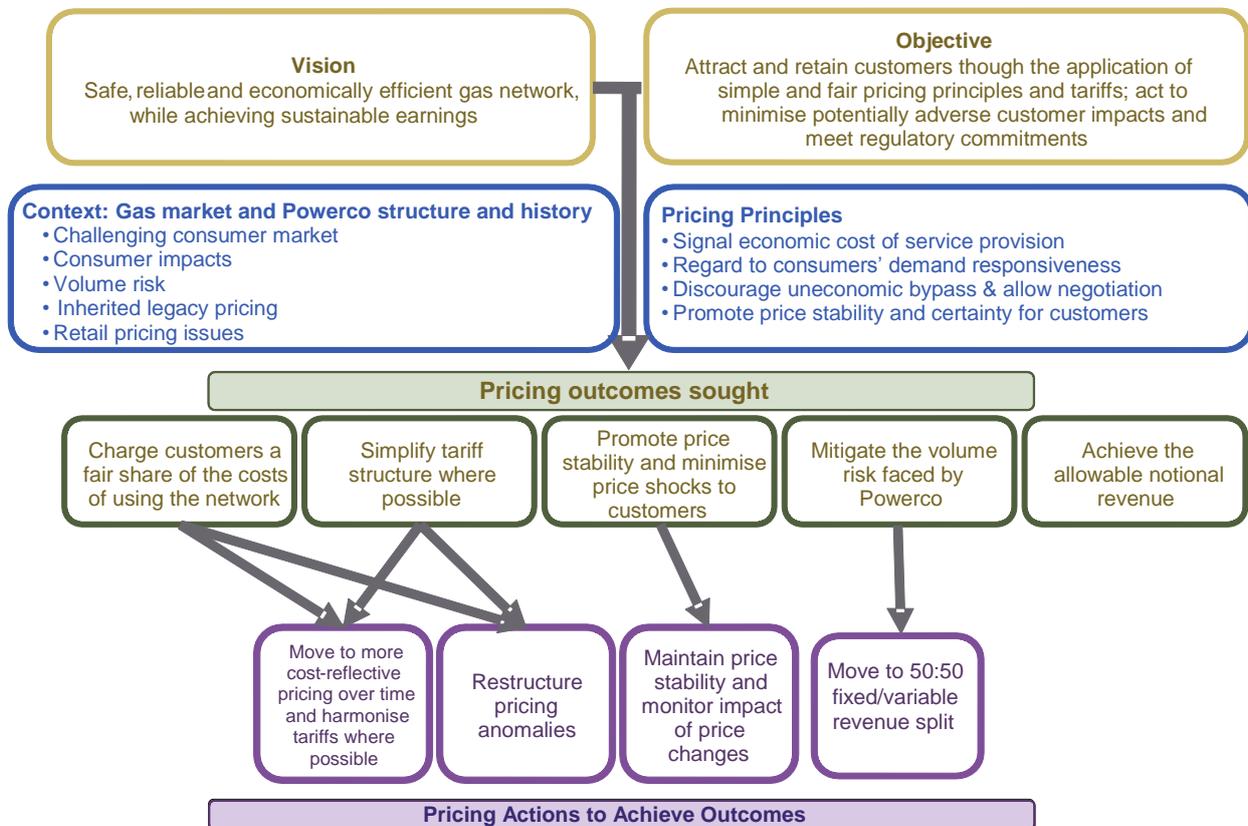
This document presents Powerco’s gas distribution pricing methodology and proposed gas distribution prices for the 2012/13 pricing year. The document has been prepared in accordance with the requirements of the Commerce Act (Gas Distribution Services Input Methodologies) Determination 2010 and the Commerce Act (Gas Distribution Services Information Disclosure) Determination 2012.

## 1.1 PRICE SETTING POLICY FRAMEWORK

Powerco’s pricing methodology framework begins with its vision for its gas business: to provide safe, reliable, and economically efficient gas network distribution services while achieving sustainable earnings. The pricing framework aims to attract and retain customers through the application of simple and fair tariffs while meeting its regulatory commitments.

When developing its pricing methodology, Powerco has considered a number of contextual factors as summarised in the diagram below.

**Schematic of Price Setting Policy Framework**



### **1.1.1 Price Setting Considerations**

There are a number of contextual factors that have helped shape the development of Powerco's pricing methodology; these are summarised below.

- **Challenging consumer market:** The consumption of natural gas is currently either stable or increasing very slowly. Promoting an increase in connection numbers and an increase in gas consumption would be in Powerco's commercial interest but would also be helpful to consumers, as it would help reduce the average cost of distributing gas. Greater use of gas would also be consistent with the government's energy and climate change strategies, as natural gas, when burned directly, is a very efficient source of energy with a smaller carbon footprint than other fossil fuels.
- **Consumer impacts:** Customers' investment in gas appliances represents a commitment to use gas in the future. As a quid pro quo, Powerco believes it has a commitment to help keep future gas prices as stable as possible.
- **Volume risk:** Annual gas consumption can vary due to weather patterns. Two part pricing can help to manage this risk.
- **Pricing structure:** Powerco's current gas distribution prices are largely a product of history; in many cases, prices have perpetuated legacy pricing structures. Where possible, this pricing methodology aims to promote greater harmonisation and simplification of prices.
- **Retail pricing issues:** Distribution prices represent 30-40% of retail gas tariffs, and gas retailers may not have the incentives that Powerco does to attract and retain gas customers. These differences present challenges in terms of delivering distribution pricing signals to end-use customers.

### **1.1.2 Pricing Outcomes Sought**

When developing and implementing its pricing methodology, Powerco has sought to:

- achieve its target revenue in order to sustain the gas network and provide for future investment;
- charge customers a reasonable share of the costs of using the network;
- promote price stability and minimise price shocks to customers;
- simplify tariff structures where possible; and
- mitigate the volume risk faced by Powerco.

### **1.1.3 Summary of medium-term pricing strategy**

#### **1. Move to more cost-reflective pricing over time and harmonise tariffs where possible**

Powerco considers that it is important for gas distribution customers to pay for the costs that are incurred in providing their services, but this consideration has to be balanced against the price sensitivity of customers. The aim is to move towards more cost reflective and regionally consistent tariffs over time. In the medium term, Powerco plans to make tariffs more consistent between its Wellington and Hutt Valley / Porirua areas and its Hawke's Bay, Manawatu / Horowhenua, and Taranaki areas.

#### **2. Move to 50:50 fixed / variable revenue split**

Over time, Powerco plans to rebalance its pricing to achieve a 50:50 fixed/variable revenue split, which will balance the economic objective of recovering fixed and sunk costs via fixed charges against the barrier to new gas connections that fixed charges represent. Powerco also recognises the preferences of its customers, who tend to favour variable charges.

#### **3. Restructure pricing anomalies**

For historical reasons fixed charges in the Taranaki region are significantly higher than in other regions. Powerco is gradually modifying these prices in order to achieve greater consistency across regions.

#### **4. Maintain price stability and monitor the effect on customers of price changes**

Powerco is concerned to ensure that reticulated gas is an attractive fuel option for households, now and in the future. Powerco places a high priority on managing the effects of any price changes, with the objective of ensuring that no individual customer's distribution charges vary by more than 15 per cent per annum.

## **1.2 DESCRIPTION OF THE PRICING METHODOLOGY**

The steps Powerco has followed when implementing its pricing methodology are:

1. determine Powerco's gas distribution costs using its network model;
2. allocate customers to network load groups, based on historical consumption volumes;
3. allocate costs to customer groups using appropriate allocation factors. Powerco's network model analyses costs within each of its five gas network areas for each of its six standard and two non-standard customer classes;
4. assess prices to determine consistency with the Commerce Commission's pricing principles and Powerco's objectives; and
5. establish a medium-term pricing strategy that will simplify the methodology and promote greater pricing consistency across regions while maintaining consistency with the Commission's pricing principles.

### 1.3 COMPLIANCE WITH THE PRICING PRINCIPLES

Powerco's compliance with the pricing principles in clause 2.5.2 of the Commerce Act (Gas Distribution Services Input Methodologies) Determination 2010 is summarised in the table below:

#### Summary of Compliance with Pricing Principles

Principle	Compliance
<p>1) Prices are to signal the economic costs of service provision, by</p> <p>a) being subsidy free (equal or greater than incremental costs, and less than or equal to standalone costs);</p>	<p>Powerco's prices fall within the subsidy-free range, as demonstrated by the charts shown in Appendix 1.</p>
<p>b) having regard, to the extent practicable, to the level of available service capacity; and,</p> <p>c) signalling, to the extent practicable, the impact of additional usage on future investment costs.</p>	<p>Coincident peak demand charging was considered, but would be impractical to implement for mass market customers. The ability to store gas in the network ("line pack") also undermines the economic case for coincident peak charging as higher peak demand does not necessarily trigger the need for additional capex.</p> <p>Locational capacity signalling is used in the case of high volume users and subdivisions located away from the existing network.</p>
<p>2) Where prices based on "efficient" incremental costs would under-recover allowed revenues, the shortfall should be made up by prices being set in a manner that has regard to consumers' demand responsiveness, to the extent practicable.</p>	<p>This pricing principle envisages the possible use of Ramsey pricing<sup>1</sup> or some form of coincident peak charging. However, Ramsey pricing is impractical as there is very limited information available on the price elasticity of demand for gas. In any event, distribution charges are invariably smaller than the charges for the energy that is consumed in conjunction with distribution services, so any price signals provided by the distribution charge are bound to be substantially diluted. With respect to coincident peak demand charging see the comment in the cell above.</p> <p>Powerco has tailored a new G06 residential tariff to reflect the preferences of small residential customers.</p>
<p>3) Provided that prices satisfy (1) above, prices should be responsive to the requirements and circumstances of users in order to:</p> <p>a) discourage uneconomic bypass, and,</p> <p>b) allow negotiation to better reflect the economic value of services and enable consumers to make price/quality trade-offs or non-standard arrangements for services.</p>	<p>Powerco offers non-standard tariffs to industrial and commercial customers to address the risk of bypass and to enable arrangements that are tailored to customers' needs.</p> <p>These tariffs are reviewed to ensure they do not exceed stand alone cost (as a proxy for bypass).</p>
<p>4) Development of prices is transparent, promotes price stability and certainty for consumers, and changes to prices should have regard to the effect on consumers.</p>	<p>Price stability and the effect of price changes on consumers have been important considerations when designing the pricing methodology and the future strategy. With few exceptions, price increases are less than 15 per cent of yearly distribution charges for all individual customers.</p>

<sup>1</sup> Ramsey pricing requires prices to be set in inverse proportion to the price elasticity of demand for the product concerned.

## **1.4 MEDIUM TERM PRICING**

Powerco expects that pricing for the next several years will continue to move towards greater harmonisation of tariffs between Wellington and Hutt Valley / Porirua and between Taranaki, Hawke's Bay, and Manawatu / Horowhenua. Prices will also be rebalanced to achieve a more even split of revenue recovery from fixed and variable tariffs. Prices are being rebalanced gradually in order to avoid any negative effects for customers that might result from sudden price changes. These adjustments should be able to be completed within the next several years.

Powerco also intends to update its network cost of supply model each year prior to calculating that year's pricing schedule. As part of this exercise, modelled elements such as service classifications, cost data and cost allocations will be revisited and assessed to ensure that Powerco is using the best available information and robust assumptions.

Powerco's commercial team will assist in this process by liaising with customers and retailers to help ensure that customers are obtaining the best value possible from Powerco's services.

## 2. POWERCO'S GAS NETWORK SERVICES

### 2.1 HISTORY OF POWERCO'S GAS BUSINESS

Powerco was originally formed in 1993 when the Wanganui Rangitikei Electric Power Board was corporatised. The acquisition in 1995 of the former gas operations of the New Plymouth District Council and the Hawera Gas Company provided the genesis of Powerco's gas networks business. The subsequent acquisition of NGC's gas distribution activities in the region in 1998 completed Powerco's gas distribution network in Taranaki.

Powerco's gas assets in the Hutt Valley and Porirua areas were originally owned by the Hutt Valley Energy Board. Subsequently, the Hutt Valley Energy Board was corporatised into the Energy Direct Corporation, merged into TransAlta New Zealand, and then sold to AGL. Powerco acquired the gas network assets from AGL in 2001.

Powerco's gas network assets in Manawatu, Hawke's Bay, and Wellington were acquired from United Networks in 2002. Previously, the assets were owned by Orion New Zealand; before that, the gas assets of Palmerston North City Council, East Coast Gas Supply, and the Wellington Gas Company were amalgamated under Enerco Limited.

The diagram below summarises the formation and amalgamation of Powerco's gas network assets.

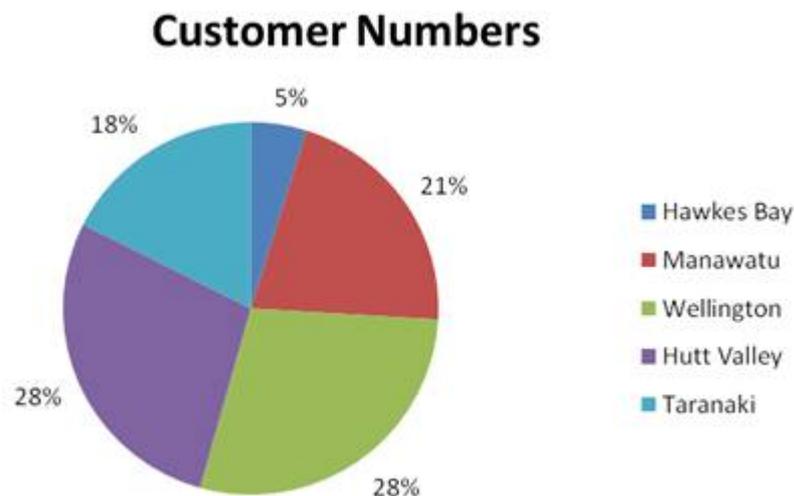
**Summary of Powerco's gas business history**

Region	> 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	> 2004	
Taranaki	New Plymouth City Council - MED (until May 1993)						Taranaki Energy Limited (7 May 1993 - Sept 1995)		Powerco Limited (Oct 1995 - Present)										
	Hawera Gas Company Ltd (Until Dec 1993)							1 Jan 1994 - Sept 1995	Powerco Limited (1998 - Present)										
	NGC [Natural Gas Corporation Holdings Limited (Included Inglewood, Stratford, Eitiam, Patea, Waverley & Opunake) (Until 1998)												Powerco Limited (1998 - Present)						
Manawatu	The Palmerston North City Council (Included Ashurst, Fielding & Levin) (Until 30 Dec 1991)					Progas Systems Limited (31 Dec 1991 - 7 Feb 1994)		Enerco Limited (Previously Auckland Gas Company Limited) (7 Feb 1994 - 31 March 1999)			Orion New Zealand Limited (31 March 1999 - 31 March 2000)		United Networks Ltd (31 March 2000 - 1 Nov 2002)		Powerco Limited (1 Nov 2002 - Present)				
Hawkes Bay	East Coast Gas Supply Limited (Merger of Napier Gas & Hastings Gas) (1983 - 1989)		WelGas Holdings (1989 - late 1992)		Enerco Limited (Late 1992 - 31 March 1999)			Enerco Limited (March 1997 - 31 March 1999)		Orion New Zealand Limited (31 March 1999 - 31 March 2000)		United Networks Ltd (31 March 2000 - 1 Nov 2002)		Powerco Limited (1 Nov 2002 - Present)					
Wellington	Wellington Gas Company Limited (Incorporated 1969 - March 1997)											Enerco Limited (March 1997 - 31 March 1999)		United Networks Ltd (31 March 2000 - 1 Nov 2002)		Powerco Limited (1 Nov 2002 - Present)			
Hutt Valley / Porirua Basin	Hutt Valley Energy Board (Previously Hutt Valley EPB, Hutt Valley Electric Power and Gas Board) (1918 - Nov 1991)					Energy Direct Corporation Ltd (Nov 1991 - June 1996)			TransAlta New Zealand Ltd (June 1996 - March 2000)		Australian Gas Light Ltd (March 2000 - 25 July 2001)		Powerco Limited (25 July 2001 - Present)						

## 2.2 PROFILE OF POWERCO'S GAS BUSINESS

Today, Powerco's gas distribution networks cover 5,682 km and serve approximately 104,000 North Island households, businesses and industries. Powerco provides gas distribution services to five regions in the North Island: Hawke's Bay, Taranaki, Manawatu / Horowhenua, Hutt Valley / Porirua, and Wellington. Hawke's Bay is the smallest region in terms of customer connections; Wellington and Hutt Valley / Porirua are the two largest, as shown in the chart below.

### Gas Distribution Customer Numbers by Region



Currently, Powerco maintains six network standard load groups; these groups are defined by nominal capacity, in standard cubic meters per hour (scmh) and by annual consumption; and they are charged standard published tariffs. Non-standard customers are those that fall outside these definitions, because they are too large to fall into one of the defined categories and/or because individual pricing arrangements apply to them because of the need to address a perceived bypass risk. The load group names and the criteria for allocating customers to these groups are described in the table below.

### Load group definitions

End Consumer Load Group	Definition
<b>G06</b>	End consumers with a load size of less than or equal to 10 scm/hr and an annual Gas usage of less than 15 GJ. This tariff group is subject to a variable only charge. Consumers that qualify for this group may opt instead to be subject to G11 tariffs (which contain a fixed element).
<b>G11</b>	End consumers with a load size of less than or equal to 10 scm/hr and an annual Gas usage equal to 15 GJ or greater. Consumers that qualify for this group may opt instead to be subject to G06 tariffs (which are variable only).
<b>G12</b>	End consumers with a load size greater than 10 scm/hr and less than or equal to 25 scm/hr.
<b>G14</b>	End consumers with a load size greater than 25 scm/hr and less than or equal to 60 scm/hr.
<b>G16</b>	End consumers with a load size greater than 60 scm/hr and less than or equal to 140 scm/hr.
<b>G18</b>	End consumers with a load size greater than 140 scm/hr and less than or equal to 200 scm/hr.
<b>G30</b>	End consumers for whom network services are individually priced.
<b>G40</b>	End consumers for whom network services are individually priced and who have a time of use meter.

#### 2.2.1 Rationale for grouping consumers in this way

The rationale for grouping consumers in this way is as follows:

- larger pipes with greater reinforcing are required by the higher volume commercial and industrial customers;
- most of the low volume connection pipes are required to service residential customers only;
- the delivery of gas exhibits significant economies of scale;
- some large customers may have the option of bypassing Powerco and connecting to an alternative network.

These characteristics mean that, for high volume customers, the fixed infrastructure costs are relatively high, but the per unit cost of delivering gas is low. Conversely, for low volume residential customers, the fixed infrastructure costs needed to service them are relatively low, but the per unit costs of delivering energy to them are relatively high. These differences drive the relative balance of fixed and variable charges that apply to the different customer groups. For the large consumers, fixed charges are higher and variable charges lower, and the converse is the case for residential customers. Where commercial bypass is a credible risk, individual non-standard charging arrangements may be justified.

The types of customer that fall into each load group are described in the table below.

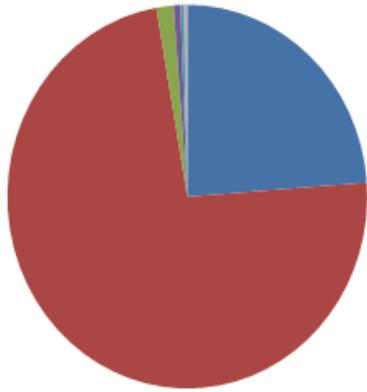
**Typical characteristics of different load group customers**

Load Group	Typical Customers
<b>Mass Market Residential Load Groups</b>	
<b>G06</b>	Small residential customers.
<b>G11</b>	Large residential customers. Small cafes, fish and chip shops, pizza shops.
<b>Mass Market Commercial Load Groups</b>	
<b>G12</b>	Restaurants, small apartment / office buildings, small to mid-sized motels
<b>G14</b>	Hotels, large motels, shopping complexes, swimming pools
<b>G16</b>	Large office buildings, apartment blocks, commercial kitchens
<b>G18</b>	Commercial laundries, dry cleaners
<b>Non-standard Load Groups</b>	
<b>G30</b> Individually priced customers who do not have a time of use (TOU) meter	Large commercial customers, large hotels Smaller commercial customers which are a bypass threat
<b>G40</b> Individually priced customers with a TOU meter	Manufacturing and industrial businesses, such as Fonterra, meat processing plants, Wattie's, ENZA, Panpac.

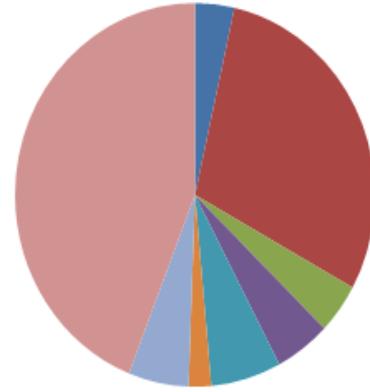
The vast majority of Powerco's network customers are standard mass-market customers; currently 204 are non-standard customers. Nearly three-quarters of the customer base are in the G11 residential Load Group. In terms of natural gas volumes, the pattern is strikingly different: non-standard customers represent about half of Powerco's annual gas consumption, and the G11 Load Group accounts for less than a third. These differences are illustrated in the charts below.

### Comparison of Network Customer Numbers with Gas Consumption

**Customer Numbers**



**Gas Consumption**



- G06
- G11
- G12
- G14
- G16
- G18
- G30
- G40

## **3. OVERVIEW**

### **3.1 DESCRIPTION OF REGULATORY REQUIREMENTS**

#### **3.1.1 Post Authorisation Arrangements**

The Commerce Act (Powerco Natural Gas Services) Authorisation (“the authorisation”), which previously regulated the prices Powerco could charge for natural gas distribution services, expired on 1 July 2012. The Commerce Commission (“the Commission”) had intended to create default price-quality paths for Powerco prior to that date to enable a transition to new regulatory arrangements under Part 4 of the Commerce Act. In fact, however, this objective was not achieved, which means that, in the interim period, Powerco is subject to s.55F(2) of the Commerce Act, which states:

*55F (2) However, if a supplier has increased its weighted average prices by more than the movement, or forecast movement, in the all groups index number of the New Zealand Consumer Price Index in the period beginning 1 January 2008 and ending with the date that the determination is made, the Commission may apply claw-back to the extent of requiring the supplier to lower its prices in order to compensate consumers for some or all of any over-recovery of revenues that occurred during that period.*

This means, in effect, that any price increases are capped by the rate of change in the Consumer Price Index (“CPI”) until a default price-quality path is determined. Any revenue earned in excess of the change in the CPI may be subsequently clawed back by order of the Commission.

#### **3.1.2 Pricing Principles – Input Methodologies Determination**

Clause 2.5.2 of the Commerce Act (Gas Distribution Services Input Methodologies) Determination 2010 defines the following pricing principles, which essentially replicate the principles that previously applied under the Authorisation:

- 1) Prices are to signal the economic costs of service provision, by–
  - a) being subsidy free (equal or greater than incremental costs, and less than or equal to standalone costs);
  - b) having regard, to the extent practicable, to the level of available service capacity; and,
  - c) signalling, to the extent practicable, the impact of additional usage on future investment costs.

- 2) Where prices based on “efficient” incremental costs would under-recover allowed revenues, the shortfall should be made up by prices being set in a manner that has regard to consumers’ demand responsiveness, to the extent practicable.
- 3) Provided that prices satisfy (1) above, prices should be responsive to the requirements and circumstances of users in order to:
  - a) discourage uneconomic bypass, and,
  - b) allow negotiation to better reflect the economic value of services and enable consumers to make price/quality trade-offs or non-standard arrangements for services.
- 4) Development of prices is transparent, promotes price stability and certainty for consumers, and changes to prices should have regard to the effect on consumers.

### **3.1.3 Information Disclosure Determination Requirements**

Clause 2.4 of the Commerce Act (Gas Distribution Services Information Disclosure) Determination 2012 states that, before the start of each disclosure year<sup>2</sup>, every gas distribution business must publicly disclose a pricing methodology that satisfies the following requirements:

- 1) Include sufficient information and commentary to enable interested persons to understand how prices were set for each consumer group, including assumptions and statistics used to determine prices for each consumer group.
- 2) Demonstrate the extent to which the pricing methodology is consistent with the pricing principles and explain the reasons for any inconsistency between the pricing methodology and the pricing principles.
- 3) State the target revenue to be collected for the current disclosure year.
- 4) Where applicable, identify the key components of the target revenue required to cover the costs and return on investment associated with the GDB’s provision of gas pipeline services. Disclosure must include the numerical value of each of the components.
- 5) State the consumer groups for whom prices have been set, and describe:
  - a) the rationale for grouping consumers in this way;
  - b) the method and the criteria used by the GDB to allocate consumers to each of the consumer groups.
- 6) If prices have changed from the prices disclosed for the immediately preceding disclosure year, explain the reasons for changes and quantify the differences in respect of each of those reasons.

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<sup>2</sup> For Powerco, 1 October – 30 September.

- 7) Where applicable, describe the method used by the GDB to allocate target revenue among consumer groups, including the numerical values of the target revenue allocated to each consumer group and the rationale for allocating it in this way.
- 8) State the proportion of target revenue (if applicable) that is collected through each tariff type as publicly disclosed annually. Every disclosure must, if the GDB has a pricing strategy:
  - a) explain the pricing strategy for the next five disclosure years (or as close to five years as the pricing strategy allows), including the current disclosure year for which prices are set;
  - b) explain how and why prices for each consumer group are expected to change as a result of the pricing strategy;
  - c) if the pricing strategy has changed from the preceding pricing year, identify the changes and the reasons for the changes.
- 9) Describe the approach to setting prices for non-standard contracts, including:
  - a) the extent of non-standard contract use, including the number of ICPs represented by non-standard contracts and the value of target revenue anticipated for non-standard contracts;
  - b) how the GDB determines whether to use a non-standard contract, including any criteria used;
  - c) any specific criteria or methodology used for determining prices for non-standard contracts, and how those criteria or that methodology are consistent with the pricing principle.
- 10) Describe the GDB's obligations and responsibilities (if any) to customers on non-standard contracts in the event that the supply of gas pipeline services to the customer is interrupted. Disclosure must explain:
  - a) the extent of the differences in these terms between standard contracts and non-standard contracts;
  - b) any implications of this approach for determining prices for non-standard contracts.
- 11) Explain whether, and if so how, the GDB has sought the views of consumers, their expectations in terms of price and quality, and reflected those views, in calculating the prices payable or to be payable. If the GDB has not sought the views of customers, the reasons for not doing so must be disclosed.
- 12) State the proportion of target revenue (if applicable) that is collected through each tariff type as publicly disclosed annually. Every disclosure must, if the GDB has a pricing strategy:

- a) explain the pricing strategy for the next five disclosure years (or as close to five years as the pricing strategy allows), including the current disclosure year for which prices are set;
  - b) explain how and why prices for each consumer group are expected to change as a result of the pricing strategy;
  - c) if the pricing strategy has changed from the preceding pricing year, identify the changes and the reasons for the changes.
- 13) Describe the approach to setting prices for non-standard contracts, including:
- a) the extent of non-standard contract use, including the number of ICPs represented by non-standard contracts and the value of target revenue anticipated for non-standard contracts;
  - b) how the GDB determines whether to use a non-standard contract, including any criteria used;
  - c) any specific criteria or methodology used for determining prices for non-standard contracts, and how those criteria or that methodology are consistent with the pricing principle.
- 14) Describe the GDB's obligations and responsibilities (if any) to customers on non-standard contracts in the event that the supply of gas pipeline services to the customer is interrupted. Disclosure must explain:
- a) the extent of the differences in these terms between standard contracts and non-standard contracts;
  - b) any implications of this approach for determining prices for non-standard contracts.
- 15) Explain whether, and if so how, the GDB has sought the views of consumers, their expectations in terms of price and quality, and reflected those views, in calculating the prices payable or to be payable. If the GDB has not sought the views of customers, the reasons for not doing so must be disclosed.

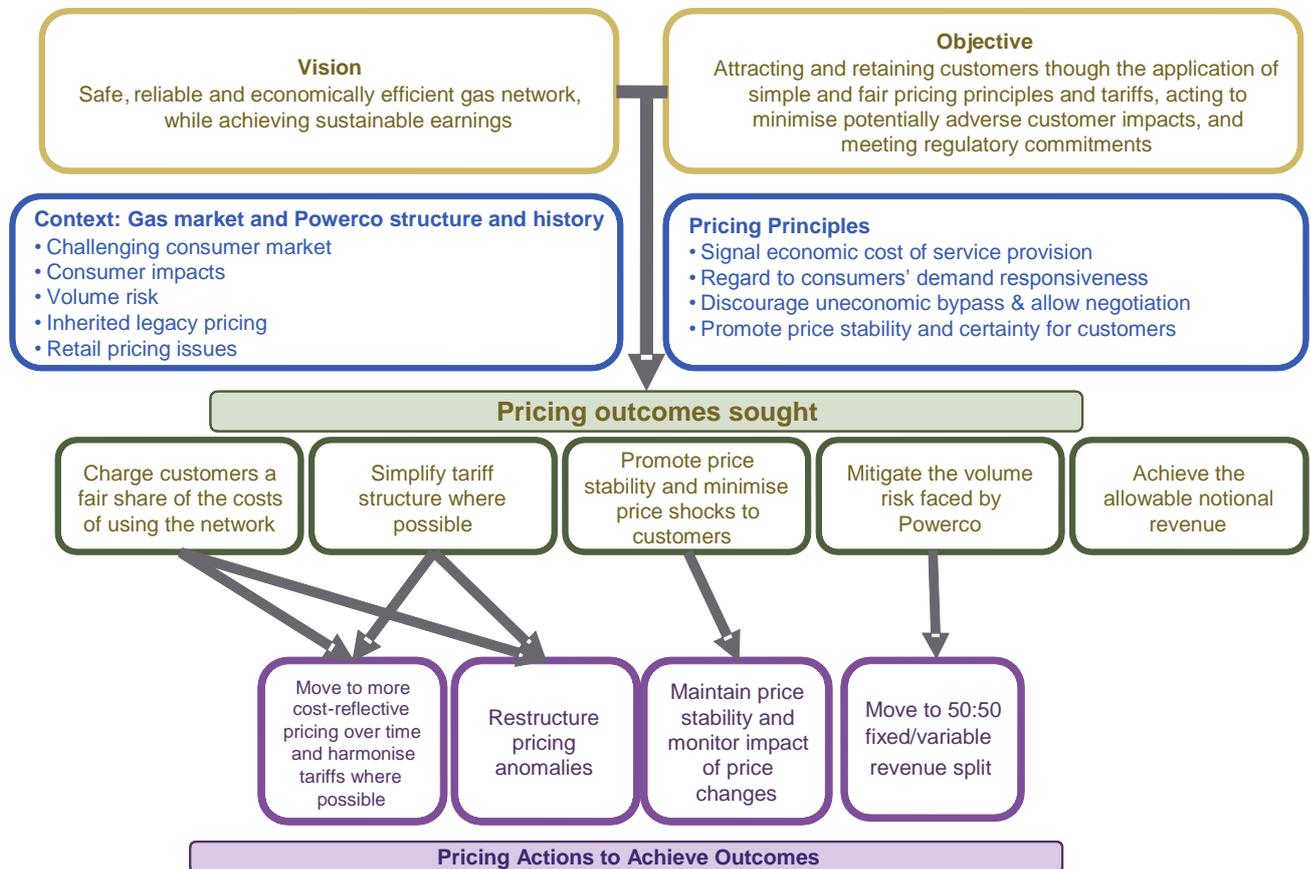
## **3.2 DESCRIPTION OF BUSINESS' PRICE SETTING POLICY FRAMEWORK, INCLUDING THE OUTCOMES SOUGHT BY THE BUSINESS FROM ITS PRICING POLICY**

### **3.2.1 Overview of the Pricing Methodology Framework**

Powerco's pricing methodology framework begins with its vision for its gas business: to provide safe, reliable, and economically efficient gas network distribution services while achieving sustainable earnings. The pricing framework is based on attracting and retaining customers through the application of simple and fair pricing principles and tariffs, acting to minimise potentially adverse customer impacts, and meeting its regulatory commitments.

When developing its pricing methodology, Powerco has considered a number of the characteristics of gas distribution markets and has given effect to the Commission’s pricing principles (see the diagram below).

### Schematic of Price Setting Policy Framework



The costs of Powerco’s gas distribution network are characterised by economies of scale, large and relatively lumpy investments, and long asset lives. From an economic efficiency perspective, prices should reflect the marginal cost of providing customers with access to the gas network. The long run marginal cost approach to pricing achieves economic efficiency by signalling the future cost of the next increment of network asset investment. With this approach, network prices would send an economic signal to customers of the cost of the next increment of load and provide locational signals for future investment (the Commerce Commission’s first principle).

However, network pricing based on economically efficient marginal costs will, by definition, not take account of the costs of already-constructed network assets; from an economic viewpoint, these costs are “sunk.” Therefore, pricing based on marginal costs does not recover the long run average costs of supply. Where prices based on “efficient” incremental costs would under-recover allowed revenues the shortfall should be made up by setting

prices in a manner that has regard to consumers' demand responsiveness, to the extent practicable (the Commission's second principle).

All of Powerco's current tariffs are above the long-run incremental cost of providing the service. The key issue when developing a pricing methodology is how network costs are allocated between Powerco's customer groups. There are a number of issues to consider when doing this, particularly the need for customers to have price stability and certainty (the Commission's fourth principle).

### **3.2.2 Price Setting Considerations**

The pricing methodology framework is guided by the characteristics of the gas market and the structure and history of Powerco's gas services. The development of Powerco's pricing methodology has been informed by a number of considerations, including the context and characteristics of the gas consumer market, historical pricing structures, and the risks and opportunities Powerco perceives in the reticulated gas market.

#### **Challenging consumer market**

Reticulated gas is a challenging consumer market in New Zealand. Although overall energy use continues to rise more or less continuously, consumption of natural gas declined for a number of years in the early 2000s. Since 2009/10, gas connections and gas consumption have either held static or increased at a moderate rate. Powerco believes that this turnaround in the demand for reticulated gas is due, at least in part, to improved marketing and a greater focus on the needs and preferences of its customers as revealed by market surveys and focus groups.

A commercially important characteristic of reticulated natural gas is that it is a discretionary fuel. Reticulated gas provides the heat for cooking, water heating, and space heating, but alternatives are available for all of these uses, including electricity, bottled gas, and solid fuel. By contrast, reticulated electricity tends to be considered essential, as few alternatives to an electricity connection exist for such applications as lighting, electronics and motorised appliances. Prospective reticulated gas consumers have a range of choices for their fuel needs, and gas prices need to be structured carefully to attract new customers. This investment decision is reopened each time a gas appliance needs replacing, and gas prices need to be attractive at that point in order to retain customers.

Hence, Powerco's price-setting process for its gas distribution business begins with consideration of its customers' needs and characteristics. Network businesses are largely fixed cost businesses; consequently, for every incremental gigajoule (GJ) or customer added to the system, the average cost per customer or per GJ will decrease (until the point where substantial new investment is required).

From a company viewpoint, growing and maintaining a sustainable gas distribution business that can deliver stable and improving earnings for its investors and lenders is consistent with Powerco's corporate mission. Maximising the use of Powerco's gas distribution network will also enable the cost of gas distribution to remain competitive with other energy sources.

There are also wider benefits to New Zealand of increasing the use of reticulated gas. Natural gas is an efficient, relatively low-carbon fuel. A study by the New Zealand Centre for Advanced Engineering found that increasing the use of natural gas for residential, commercial and industrial space heating, water heating, and cooking could improve New Zealand's energy efficiency and lower its greenhouse gas emissions.<sup>3</sup> Increasing the direct use of natural gas could therefore help New Zealand to decrease net energy usage and improve the country's greenhouse gas emissions profile.

### **Customer Impacts**

Customers that are currently connected to Powerco's network have made an investment that allows them to use natural gas: for residential customers, they have either bought a house that includes gas appliances and fixtures, or they have invested in new gas applications. At the upper end of the residential gas market, such an investment can be substantial; new gas water heating and central heating systems are examples of these types of major household investments. Commercial customers similarly have invested in gas applications for their places of business.

Powerco understands that the magnitude of these customer investments implies a commitment on the part of its customers to reasonably long-term consumption of reticulated natural gas. Customers' investments have taken place in the context of the gas prices that existed at the time of the investment and with the expectation that gas prices would remain about the same in the future. In return, Powerco believes that it has a commitment to its customers to keep distribution prices as stable as reasonably possible.

Powerco's understanding of the effect on customer of changes to gas prices is also informed by previous experience. For example, retail tariffs to residential customers in some of Powerco's gas network regions were at one point completely variable, with no fixed daily charge. When the incumbent gas retailer restructured its prices to include a daily fixed residential charge, Powerco experienced a significant increase in the number of disconnections in the regions.

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<sup>3</sup> New Zealand Centre for Advanced Engineering, *Understanding the Contribution of Direct Use of Gas to New Zealand's Future Energy Efficiency Objectives*, November 2007.

Powerco therefore intends to manage carefully any change of tariffs to its gas distribution customers, in order to honour the commitment implied by previous prices and to mitigate the risk of customer disconnection.

### **Volume risk**

There are two aspects to the business risk that Powerco faces as a natural gas distribution business. The first is the risk associated with possible customer disconnection. The second is volume risk caused by yearly variation in end-use customers' consumption, some of which will be weather related.

Any pricing framework must therefore have regard to the risk that it might impose on company revenues, consistent with Powerco's mission to provide sustainable returns and growth for shareholders.

### **Pricing structure**

Powerco's experience is that reticulated gas customers, particularly residential customers, do not fully comprehend the way in which retail gas pricing works. Gas pricing, like electricity, is made up of a number of discrete elements that are bundled by gas retailers, and each of these elements can itself be priced in a complex way. Gas transmission charges, for example, can arise from the Maui pipeline or the Vector transmission system, each of which has its own pricing arrangements. The Gas Industry Company levy has two components, a per-ICP charge for retail customers and a per-GJ charge for wholesale market transactions; both of these are incorporated into the retail tariffs faced by residential and commercial customers. Gas distribution charges are another source of complexity.

Powerco's current gas network prices are largely a product of history. As Powerco has grown its gas business both organically and by acquiring new gas network regions, a patchwork of different tariffs has developed through the continuation of legacy tariffs and other historical anomalies. For Powerco, the current process of developing a pricing methodology has been an opportunity to examine existing price structures and to consider rationalisation and simplification where possible.

Simpler price structures would benefit gas retailers Powerco's own business, by lowering the administration costs associated with tariff changes and billing procedures. Powerco would prefer the effects of such price simplification to be passed through by retailers and hence able to be seen by end-use customers.

### **Retail pricing issues**

On average, gas distribution services represent about 30-40% of a residential gas consumer's total annual gas bill.<sup>4</sup> While this is a significant proportion, it also means that any pricing signals that a gas distribution company attempts to convey to end use customers may be modified in the final retail charges. This difficulty is compounded by the fact that energy retailers may have different objectives with respect to end-use gas customers.

For the major gas retailers in New Zealand (Contact Energy and Genesis Energy on Powerco's networks), gas represents only a relatively small portion of their retail portfolios; electricity retailing tends to be their primary focus. In addition, two major gas retailers now also offer liquefied petroleum gas (LPG) services to their customers. Gas retailers are therefore able to offer their customers a range of competing energy options, while Powerco can only provide reticulated natural gas services with its gas pipelines. This difference means that retailers' business incentives may not be in alignment with Powerco's, with a resulting mismatch between business strategies and objectives with respect to natural gas customers.

In particular, energy retailers may be relatively indifferent as to the type of energy they supply to customers. A customer's decision to install natural gas appliances in an existing household will lead to a decrease in the electricity consumed by that household, and the switch may represent no net benefit to the retailer. Equally, a decision by a customer to disconnect from reticulated gas will result in an increase in that household's electricity usage or a switch to bottled gas, and again the retailer may be indifferent between these outcomes.

In contrast, Powerco has a very strong incentive to connect new gas customers and to retain the ones already connected. Simply put, each additional reticulated gas customer on Powerco's network increases the use of our existing gas assets and lowers the cost per customer.

These differences are not merely academic; in Powerco's experience, there are real differences in gas retail and distribution business strategies, particularly with regard to pricing. As an example, Powerco's own experience, supported by market research findings<sup>5</sup>, suggests that many households perceive the fixed component of retail gas tariffs to be too expensive: increases in fixed charges have directly led to increased in

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<sup>4</sup> As determined by the Ministry of Economic Development, *Domestic Gas Prices*, available up to 1 September 2008.

<sup>5</sup> *Powerco Market Research, Stage 1 Qualitative Research*, July 2011 and *Stage 2 Quantitative Research*, September 2011, Peter Glen Research.

disconnections, and fixed charges are frequently cited as a deterrent to natural gas usage by survey respondents. However Powerco has found that gas retailers often prefer to set a relatively high fixed gas tariff component, which represents a stable cash flow and a relatively high profit margin. To a gas retailer, these benefits seem to outweigh any negative effects that a high fixed tariff has on customer recruitment and retention. In fact, Powerco has in the past lowered its fixed charge, only to see retailers absorb the decrease, rather than pass it through to customers.

### 3.2.3 Pricing outcomes sought

#### **Achieve the allowed target revenue**

Powerco's primary pricing objective with respect to its gas network is for pricing to contribute as part of an overall strategy to a vibrant and sustainable gas business, that is, Powerco seeks to recover its allowed target revenue to sustain the gas network business and provide for future required investment.

#### **Charge customers a reasonable share of the costs of using the network**

As far as practicable, customers should be charged a price that reflects the costs of providing the service to them. However, cost reflective charging is not the only objective considered when determining prices.

Professor Alfred E. Kahn wrote;<sup>6</sup>

*The basic defect of full cost distribution as the basis for pricing is then that they ignore the pervasive discrepancies between marginal and average cost. [T]hose discrepancies may require prices that take into account not just the costs but also the elasticities of demand of the various categories of service if the company is to recover its total costs. Whenever there is some separable portion of the demand sufficiently elastic that a rate below fully-distributed costs for it would add more to total revenue than to total costs, any insistence that each service or group of patrons pay their fully allocated costs would be self-defeating. It would force the firm to charge a price that would result in its turning away business that would have covered its marginal costs – in other words would prevent it from obtaining from customers with an elastic demand the maximum possible contribution to overheads."*

Powerco aims to set tariffs that are cost reflective, but equally aims to ensure that customers face prices that they perceive to be a reasonable and fair reflection of the service provided. In particular, Powerco aims to treat low volume residential customers equitably.

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<sup>6</sup> Alfred E. Kahn, *The Economics of Regulation, Principles and Institutions*, 1971, p.155.

### **Promote price stability and minimise price shocks to customers**

Existing customers have chosen to invest in natural gas appliances with an expectation that future prices will be reasonably comparable to past prices. Therefore, any necessary price movements should be implemented gradually over time. Future price movements will be informed by customer reactions to previous changes as well as by customer consultation on prices.

### **Simplify tariff structure where possible**

Simpler price structures can benefit customers, because they make understanding distribution tariffs easier. In addition simple tariff structures benefit retailers through lower administration costs.

### **Mitigate the volume risk faced by Powerco**

Prices should be structured in a way that, to the extent practicable, fairly reflects the extent of Powerco's fixed costs, and consequently mitigates the risk associated with annual fluctuations in consumption, while responding to customers' preferences for variable tariffs.

## **3.3 SUMMARY OF MEDIUM TERM PRICING STRATEGY**

### **1. Move to more fully cost reflective pricing over time and harmonise tariffs where possible**

Powerco considers that it is important for gas distribution customers to pay for the costs that are incurred in providing their services. However, progressing towards this goal needs to be balanced against the price sensitivity of customers. As discussed previously, gas is a discretionary fuel, and there is a real risk of customer disconnection if price increases are too rapid. Powerco has experienced disconnections following previous retail gas price increases.

The goal eventually is to harmonise tariffs between the Wellington and Hutt Valley/Porirua. These two network regions are contiguous; they also have the same gas transmission charges and about the same costs of connecting new customers. (Because these regions are more urban compared to Powerco's other regions, the incidental costs of connection for items such as traffic management are higher there than in the regional networks.) Customer demographics are also similar between the regions. For these reasons, there is good rationale for combining Wellington with Hutt Valley/Porirua into a single network region at some point in the future.

For Hawke's Bay, Manawatu, and Taranaki, the goal is to make network prices more consistent across regions whilst recognising the differences in delivered energy cost: gas transmission prices differ significantly between these regions, and Powerco takes these

transmission price differences into consideration when it sets its own tariffs. Because of these regional differences, separate tariffs for each region may continue to be justified. However, Powerco considers that more consistent prices could be perceived by its customers to be more equitable and more transparent.

**Pricing outcomes sought by this step:**

- Charge customers; cost reflective but equitable prices
- Over time, simplify tariff structures;
- Provide customers with transparent pricing.

**2. Move to 50:50 fixed / variable revenue split**

As noted above, Powerco is exposed to risk not only from the number of customers that choose to connect and to stay connected to the gas network, but also in relation to variations in the amount of gas that is consumed in any year, some of which will be weather related. A pricing regime that derived most of its revenue from fixed daily charges would address this risk and would be consistent with the nature of Powerco's costs, which are largely fixed.

On the other hand, Powerco recognises that customers see a benefit from variable arrangements. Powerco addresses both these considerations by balancing commercial risk against the need to make natural gas attractive to current and prospective users. Powerco expects, in the medium- to long-term, to rebalance its pricing so that approximately 50% of network revenue comes from fixed charges and 50% from variable charges, on average.

Consistent with Powerco's medium-term pricing strategy, the move towards a balanced fixed/variable revenue split will be accomplished gradually over time. At present, about 40% of network revenue is derived from fixed tariffs.

**Pricing outcome sought by this step:**

- Mitigate volume risk;
- Set tariffs with a variable component that acknowledges consumer preferences.

**3. Restructure pricing inconsistencies**

In general, pricing structures are relatively consistent between the Hawke's Bay, Manawatu/Horowhenua, Hutt Valley/Porirua, and Wellington regions. Fixed charges are relatively small for small residential customers and increase with load group consumption through the large commercial standard customers. Volume charges per GJ follow the opposite pattern: relatively high at the low end of consumption and progressively lower for larger customers.

For historical reasons, the tariffs for Taranaki are outliers: although they follow the relative progression patterns noted above, daily charges in Taranaki are higher than the corresponding charges in other regions, and the variable charges are lower.

Powerco considers that these anomalous tariffs should be restructured to be more representative of Powerco's general pricing structure. Bringing these tariffs into line with other tariffs would simplify Powerco's pricing and make them easier to implement. Powerco intends to conduct this restructuring in a way that would have very little overall revenue impact. However, Powerco is conscious that such restructuring could have large effects on the tariffs charged to individual customers, particularly at the high end of the consumption range. Therefore, as with the other price changes, Powerco intends to implement this restructuring conservatively and to limit the impact that any one customer experiences from the changes.

**Pricing outcomes sought by this step:**

- Charge customers cost reflective but equitable prices;
- Over time, simplify tariff structures;
- Enable customers in Taranaki to benefit from lower fixed charges;
- Ensure customers consistently benefit from increasing consumption volumes.

**4. Maintain price stability and monitor customer impact of price changes**

The effect of price changes on customer groups, particularly the residential tariff groups, is important to Powerco. Powerco is concerned to ensure that reticulated gas is an attractive fuel option for households, now and in the future. Gas price stability and certainty affect a household's decision whether or not to make the investment to convert to gas appliances and whether or not to remain with gas in the face of other available fuel choices.

Powerco intends to monitor closely the effects of its price changes to determine the impacts on customer consumption and connection/disconnection rates. Powerco will also be analysing results to determine if there are material differences in the way that customers in different regions react to the price changes.

Any price changes Powerco makes in subsequent years will depend on the results of and customer reactions to the price changes contained in this pricing methodology report. Powerco will not commit to a course of action that would lead to a significant number of disconnections, as it believes this would be contrary both to Powerco's business interests and the interests of its customers. Therefore, Powerco envisages that the process of moving prices for whatever reason – to implement fully cost reflective charges, revenue

stability, price structure alignment – will be gradual and will utilise information from previous price changes to inform the direction and magnitude of future changes.

**Pricing outcome sought by this step:**

- Promote price stability and minimise price shocks to customers.

## **4. PRICING METHODOLOGY**

### **4.1 DESCRIPTION OF PRICING METHODOLOGY FOR REGULATED SERVICES**

This section provides an overview of the methodology used to set network prices. Detailed descriptions of a number of key steps are provided in later sections.

The methodology for setting Powerco's network prices applies the following steps:

1. determine Powerco's costs of gas distribution;
2. allocate customers to network load groups, based on historical consumption volumes;
3. allocate costs to customer groups using an appropriate allocation factor. Powerco's network cost of supply model analyses costs within each of its five gas network areas for each of its six standard and two non-standard customer classes;
4. assess price structures to determine consistency with the pricing principles and objectives; and
5. establish medium term price paths to make prices more cost reflective and consistent across regions, while satisfying the Commission's pricing principles.

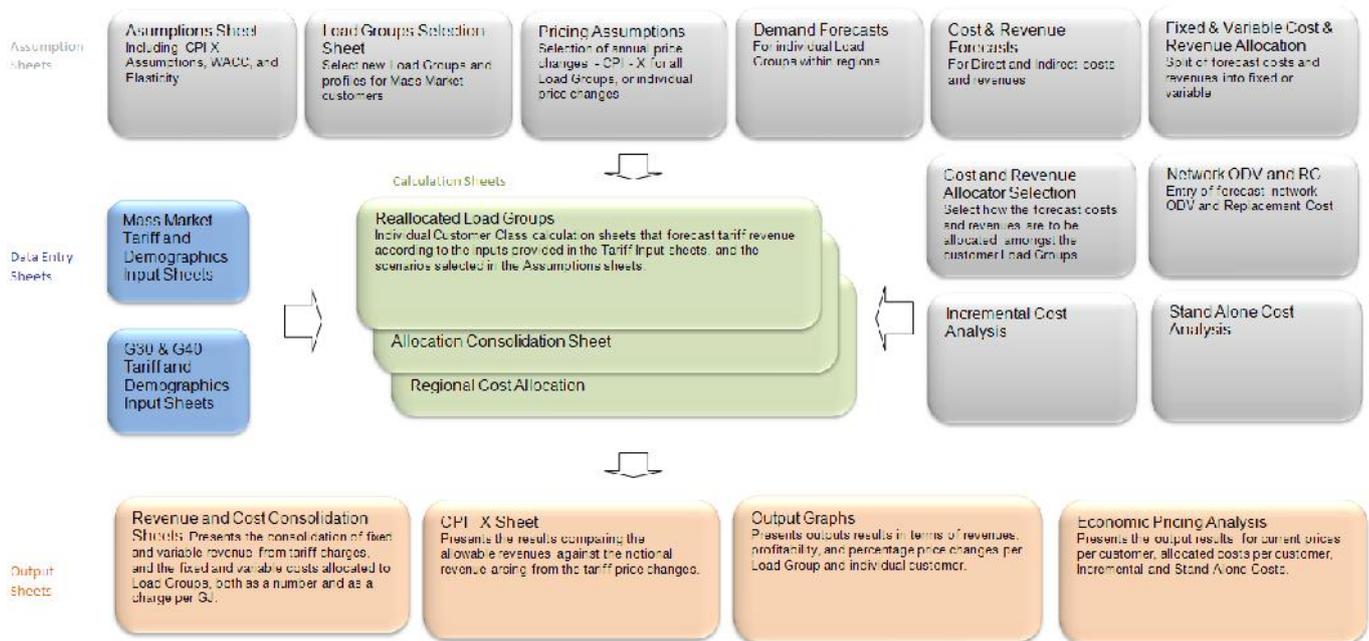
### **4.2 PRICING METHODOLOGY DEVELOPMENT**

#### **4.2.1 Cost of supply model**

Powerco's cost of supply model for the gas network business allows the user to allocate costs and revenues across the respective tariff load groups using alternate allocation methods. The models develop a total cost per network load group as well as a cost per GJ and/or a cost per day. In addition, the model allows the user to assess alternative future tariff scenarios to compare future pricing against future costs.

A schematic of the network model is presented below. There are a number of assumption sheets (coded grey in the figure) that include parameters such as weighted average cost of capital (WACC), consumer price index (CPI) figures, demand forecasts, and cost and revenue forecasts. The blue boxes show the data entry sheets that contain ICP data for each of Powerco's customers. Calculation sheets allocate ICPs to defined load groups and allocate costs based on the parameters selected. Pink-coded output sheets show distributed costs, analyse the subsidy-free tariff range, and evaluate pricing scenarios for compliance with the aggregate price cap. Powerco intends to finalise an updated network model for the pricing year commencing 1 October 2013.

### Network Model Schematic



#### 4.2.2 Service Class Definitions and Quality

##### Network Load Group Definitions

Network Load Groups are delineated by nominal capacity, in scmh, and by annual consumption, as shown in the chart below.

**Network Load Group Definitions**

Load Group	scmh		Annual Consumption	
	Min	Max	Min GJ	Max GJ
<b>G06</b>	0	10	0	15
<b>G11</b>	0	10	15	Unlimited
<b>G12</b>	10	25	15	Unlimited
<b>G14</b>	25	60	15	Unlimited
<b>G16</b>	60	140	15	Unlimited
<b>G18</b>	140	200	15	Unlimited
<b>G30</b> Individually priced customers who do not have a TOU meter	n/a	n/a	0	10 TJ
<b>G40</b> Individually priced customers with a TOU meter	n/a	n/a	10 TJ	Unlimited

### Network Service Quality

The provision of a safe and reliable gas network distribution service is an integral part of Powerco's business. Consumer safety is paramount in the management and operation of a gas pipeline network. Gas pipeline faults are inherently more dangerous to consumers than electricity network outages, and consequently more stringent safety requirements apply to gas pipeline operators.

Powerco must comply with the very high safety standards under the Gas Act 1992, the Gas Regulations 1993 (SR 1993/76), and NZS5258 (Gas distribution networks). In particular, Powerco must ensure that appropriate network pressure is maintained at all times to ensure that domestic and commercial gas appliances connected to the network are able to operate safely and satisfactorily.

Powerco must operate all parts of its networks to a very high level of availability, as any form of supply interruption would result in a requirement to physically inspect all affected gas appliances and installations, an expensive and time-consuming process. This is because some domestic appliances do not automatically shut down in the event of a gas supply interruption. Once gas supply is restored to these appliances, there is a risk that pilot lights may not reignite, causing an unsafe build up of uncombusted gas that can result in an explosion. There is also the risk of air entering the gas pipeline and causing supply interruptions or explosions. As a result of these risks, Powerco targets and achieves a very high level of availability throughout its networks, and this standard is available to all customer classes.

As the level of availability is high across the network, the network is interconnected and consumers of different classes are geographically diverse, different levels of quality are not offered to different customers, i.e. all customers receive the same level of service quality.

Network service quality is monitored and audited by the Energy Safety Service (a branch of the Ministry of Business, Innovation and Employment). There are also legal requirements under the Gas Regulations to report certain types of incidents. Powerco must publicly disclose other system condition and reliability information under other regulations.

The table below describes customer service with respect to three quality measures.

### Gas Network Quality Measures

Quality Measure	Customer Service
System reliability (including planned and unplanned interruptions and outage events)	System reliability on Powerco's gas network is very high. All customers receive broadly the same level of quality with respect to this measure.
System condition and integrity (including leaks, poor pressure due to network causes and unaccounted for gas).	System condition and integrity on Powerco's gas network is very high. All customers receive broadly the same level of quality with respect to this measure.
Customer service (including responses to emergencies, answering telephone calls and responding to complaints)	Powerco operates a Network Operation Centre that provides 24/7 service for gas outages and emergencies. All customers receive the same level of service with respect to this measure. Customers can ring Powerco directly or their retailers in the event of a gas emergency. There are protocols in place for communications between Powerco and the retailers on the gas network.

One possible exception to the rule of uniform quality across the gas distribution network is in terms of service pressure. In some cases, large industrial customers can specify, and receive, delivered gas pressure that satisfies the particular requirements of their businesses. This possibility is described in section 4.2.3 below.

#### 4.2.3 Quality of Service and Costs

All customer groups receive the same quality of service, in terms of system reliability, system condition and integrity, and customer service. Any other approach would be inconsistent with maintaining network safety.

However, it is also true that gas distribution networks are generally highly reliable. There is significantly less scope to enhance reliability by investing in additional security-based measures than in electricity distribution. This means that there is limited scope for a cost-quality trade off, even if it were safe to do so.

In theory, standard prices based on different system pressure levels could be offered, if the number of customers that would benefit were sufficiently large, had similar end use requirements and were located in clusters where the network could be designed to meet the enhanced requirement. In practice, Powerco does not believe such a standard and localised requirement exists. Commercial customers are dispersed across Powerco's networks, and the situations where end use appliances require higher than standard network pressure are rare.

There are some specific instances where prices do vary due to service quality, but the number of occasions is small and the service levels required are very specific to end user requirements. The customers in these cases tend to be large industrial businesses, and a special non-standard price is developed that reflects the cost of providing the required service to the customer's specific location.

#### **4.2.4 Cost Allocation Methodology**

##### **Cost allocation for network services**

Conceptually, there are three possible categories of costs:

- costs that are directly attributable to a specific load group within a specific region; currently no costs are allocated in this way;
- costs that are attributable to a specific region but not a specific load group, for example the costs of reactive maintenance, scheduled maintenance and customer initiated maintenance; and
- indirect costs, which cannot be attributed to a region or a load group, for example administration costs, information technology costs and some pass through costs.

Costs that are directly attributable to a specific load group within a specific region do not need to be allocated; they can merely be assigned to the relevant load group. The cost of supply model allows costs of this nature to be included in the evaluation, though none has been identified.

The other two categories of costs need a specific method to allocate them to load groups. It is important to note that networks create economies of scale through shared assets and there is no single "correct" way of efficiently allocating the resulting common costs. In practice, however, the possible allocators available are limited.

In all cases, Powerco has attempted to allocate costs based on the factor that is most closely related to the cause of the costs.

Regional costs have been allocated as follows:

#### Regional Network Cost Allocators

Directly Attributable Costs to Regions	Cost Allocator
Reactive Maintenance	Replacement Cost
Scheduled Maintenance	Replacement Cost
Customer Initiated Maintenance	Replacement Cost
Depreciation of Network Assets	Replacement Cost
<b>Other Direct Costs</b>	
Direct Rates to Regional Property	Replacement Cost
Other Direct Regional Costs	Replacement Cost

Using the gross (replacement) asset value rather than a depreciated number ensures costs are allocated using a value that directly reflects the service potential of the asset rather than depreciated historical cost, which declines with age and then increases sharply when assets are replaced. The method used to allocate asset values to load groups is described in the Asset Value Allocation section below.

Indirect costs have been allocated on the basis of the following allocators:

#### Indirect Network Cost Allocators

Indirect Costs	Cost Allocator
Administration	Customer Numbers
Engineering Support	Replacement Cost
Pass Through Costs	
• Audit Fees	Customer Numbers
• Indirect Rates	Customer Numbers
• Statutory Levies	Customer Numbers
• Other Indirect Costs	Customer Numbers
Return on Assets	
• Depreciation of Network Assets	Replacement Cost
• Amortisation of Intangibles	Customer Numbers
• WACC	Replacement Cost
Taxation	
• Taxation Expense	Replacement Cost

Generally, costs that are asset-related (which include depreciation and return on assets and, by extension, taxation) are allocated on the basis of the share of Powerco's total replacement cost that a particular load group uses. Costs that are not directly related to assets, such as administration and pass through costs, are allocated equally across all customers.

Powerco uses replacement costs as the allocator for the regulated capital charge (WACC). For this exercise, replacement costs are more appropriate as an allocator than optimised deprival value<sup>7</sup> (ODV) or depreciated costs, as using depreciated costs would tend to produce volatile allocation results over time as aged assets are replaced by new assets. By contrast, replacement cost provides an allocator reflecting the investment without the age dependent variation that a depreciated asset allocator would involve. An additional consideration is that, as an element of pricing, cost allocation using ODV would act to counter ideal economic signals; for example:

- customers mainly connected to older assets would have a lower cost allocation but the assets may be more likely to require enhancement and economic based pricing could be higher to reflect this; and
- customers mainly connected to newer assets would have a higher cost allocation but the assets may be more likely to have surplus capacity and economic based pricing could be lower to reflect this.

Consequently, Powerco has used replacement costs as the basis for allocating the capital charge because of the stability this allocator offers and because it more closely reflects economic pricing considerations.

### **Network Asset Value Allocation Methodology**

The costs attributable to a specific region tend to be related to the value of network assets needed to service the region. For this reason, there is a need for a methodology to allocate regional network asset values to load groups. Broadly, the methodology Powerco has adopted estimates the percentage of regional assets used by each load group based on the types of assets employed and the annual consumption of each load group.

The analysis involves three steps, which are outlined in greater detail in the sections below.

1. The first step is to group network assets into System Categories.
2. Load groups are assigned to one or more System Categories depending on the assets used to supply their loads.

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<sup>7</sup> Optimised deprival value means the lower of optimised depreciated replacement cost or economic value (value of the best alternative use of the asset).

3. A load group's share of the total annual consumption for System Category is used to assign a portion of that System Category's value. These System Category value portions then are summed for each individual load group to give its total asset value allocation.

### **System Category assignment**

Powerco's network assets can be broadly broken down into three distinct modern equivalent asset System Categories: Intermediate Pressure (IP), Medium Pressure (MP), and Services (which include Low Pressure (LP) and MP). The assignments made are shown in the table below.

**Asset classes assigned to each System Category**

<b>Intermediate Pressure</b>	<b>Medium Pressure</b>	<b>Services</b>
Cathodic Protection	Land	LP Services
IP Mains	LP Mains	MP Services
IP Services	MP Mains	
IP Valves	MP Valves	
SCADA	Stations	
<i>Crossings</i>	<i>Crossings</i>	
<i>Standby Pipe</i>	<i>Standby Pipe</i>	
<i>Traffic Management</i>	<i>Traffic Management</i>	

Cathodic Protection has been allocated to the IP System Category, as it would primarily be used to protect the steel pipe that makes up all of the IP Mains. SCADA has also been allocated to the IP System Category, as it is primarily used to monitor the gas pressures and flows through the IP networks.

Station assets have been allocated to the MP System Category, as they only exist to provide the lower pressures used in the MP networks. Land has also been allocated to this System Category, as each station location requires land.

Italicised asset classes are common to both the IP and MP System Categories. In these cases, the asset class's value is shared between the System Categories based on the proportion of total mains length in each System Category. For this exercise, the MP System Category mains length is the sum of the MP Mains and LP Mains lengths.

### **Load Group assignment**

Each load group is served by a different collection of System Categories. The large industrial customers that make up the G40 tariff group are almost exclusively served by the

IP System Category, the Load Groups usually assigned to commercial customers are served by the IP and MP System categories, and finally the residential load groups are served by all three System Categories. These assignments are shown in the table below.

#### **Assignment of Load Groups to each System Category**

<b>Intermediate Pressure</b>	<b>Medium Pressure</b>	<b>Services</b>
G06	G06	G06
G11	G11	G11
G12	G12	
G14	G14	
G16	G16	
G18	G18	
G30	G30	
G40		

#### ***Determining Allocation Shares***

The annual consumption volumes for each load group are entered into the table where they appear, and total volumes within each System Category are calculated to give the total annual demand for that category. Within each System Category, a load group's contribution to the total annual demand is calculated as a percentage of that Category. For example, if a load group contributed 5,000 GJ to the total annual demand of 20,000 GJ in the IP System Category, then it would be allocated 25% of the IP System Category. If this load group were also represented in the MP System Category, then it would account for a larger percentage of the MP System Category as the overall total would be smaller.

Within each System Category, load groups are weighted according to the percentage of consumption volume that each contributes to the overall consumption within that category. These percentages are then multiplied by regional asset values to derive the value of assets used by each load group within each category. To continue the example above, if this IP System Category had an asset value of \$200,000, then the load group in question would be allocated 25% of this amount, or \$50,000. These asset value shares are then summed across load groups to obtain the total value of system assets used by each load group. Finally, these values are converted to a proportion of total regional network asset value. These proportions are used as allocators in the network model.

#### **4.2.5 Analysis of the extent to which costs are marginal, and whether the associated price components in the tariff structure reflect those marginal costs**

Marginal costs are very difficult to evaluate in a meaningful way for gas distribution companies. The term “marginal” implies the cost of the next additional unit of production and long run marginal cost (LRMC) refers to the cost of providing an additional unit including the capital cost of added capacity. The marginal cost for a distribution company is zero much of the time, meaning that the next unit of gas can be distributed within the existing capacity of the network system; once in a while, marginal cost is a very large number, meaning that the next unit of gas would require additional installed capacity to distribute it. Because of this dichotomy, the application of a strict definition of marginal cost would lead to a step-wise pricing function, which would be neither practical to implement nor conducive to price stability.

In order to avoid the difficulties inherent in evaluating marginal cost, Powerco uses the long run average incremental cost of service (LRAIC) as a proxy for marginal cost. Incremental costs are those that are caused by the addition of incremental units of volume load on the distribution system. LRAIC is an adaptation of the LRMC approach and is widely used by network businesses; it involves evaluating all forward-looking load-dependent costs as a function of incremental volume. These costs are the average costs that Powerco would incur on a per GJ basis as a result of additional volumes of gas flowing through its distribution pipelines and, as such, they do not include the costs related to already-constructed assets. Prices based on these incremental costs would under-recover allowed revenues.

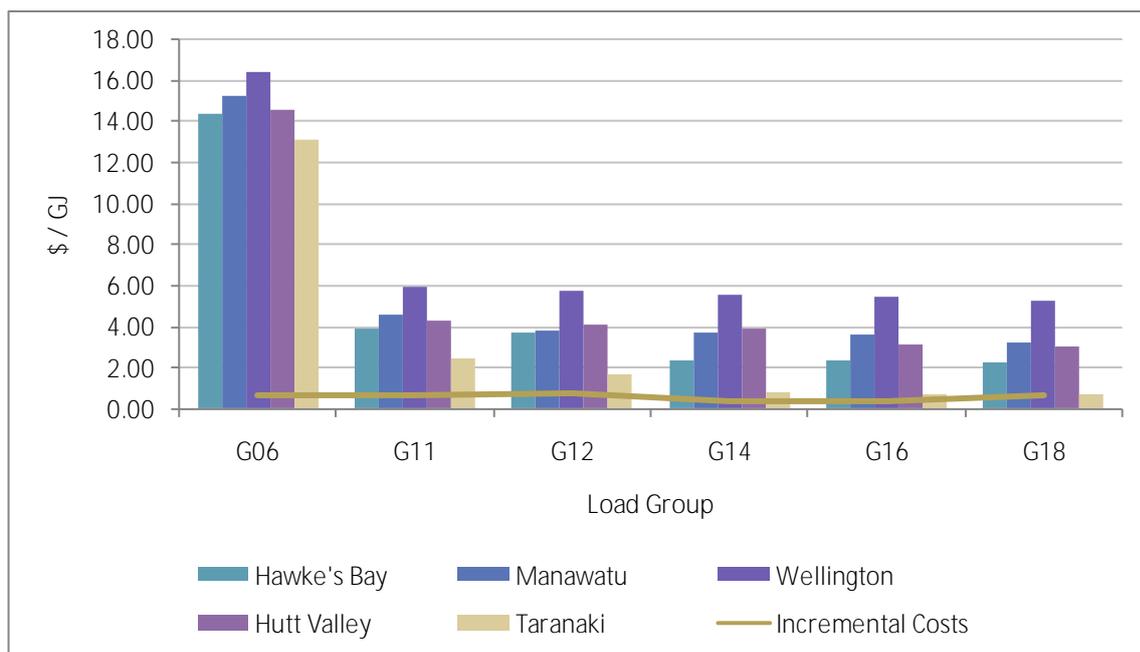
The methodology used to do this evaluation is detailed in section 4.2.6 below. In 2009, incremental costs fell between \$0.0101/GJ and \$0.7627/GJ for network services. These values will be recalculated once the network model is updated.

It is a characteristic of distribution companies that they have large fixed costs and substantial economies of scale in their operation. As a result, for such companies, the average cost of serving a customer is greater than the marginal cost of service. Attempting to address this situation, while still providing meaningful cost signals to consumers, is the justification for a two-part tariff: one that contains a fixed, daily charge as well as a consumption-based variable component. From an economic point of view, such a two-part tariff should ideally be structured such that all marginal costs are charged on a variable basis and all other costs on a fixed basis (so as not to distort consumption behaviour). However, this ideal is just one of several competing and sometimes contradictory objectives Powerco is trying to balance when developing its pricing methodology.

Powerco has limited tariff tools available to signal marginal costs and, as a network business, its marginal cost signal would generally (and correctly) be swamped by the marginal cost of the fuel. Further, it is not practicable to reflect Powerco’s long run average incremental costs in the variable tariff component, due to the fact that the long run marginal cost of service is very small, compared to the average revenue that needs to be recovered from each customer group. Instituting such a low charge for the variable component of the tariff would mean a correspondingly higher fixed charge would need to be implemented. Such a high fixed charge would act as a significant deterrent to existing and potential customers.

Powerco has therefore determined that the variable tariff component must reflect at least the LRAIC. This will ensure that the incremental costs (which are essentially avoidable costs if no incremental load occurs) are signalled to customers. A comparison of 2009 variable network charges and network LRAIC is shown below.

**Comparison of Network LRAIC with Variable Charges in \$/GJ**



#### **4.2.6 Subsidy-free prices**

For prices to be subsidy-free they must be set equal to or greater than incremental costs and less than or equal to standalone costs.

##### ***Standalone cost methodology – standard gas distribution customers***

For standard gas distribution services, standalone costs are established by estimating the costs by load group likely to be incurred by a notional efficient competitor to Powerco's distribution network. In other words, the standalone cost methodology estimates the bypass cost of supplying each of Powerco's load groups. This is an appropriate approach to determine stand alone costs for the tariff group and is consistent with how standalone costs have been calculated in other regulatory jurisdictions. Using tariff groups as the basis for evaluation is the smallest practical grouping of customers that could be used for this analysis.

##### ***Overview of the methodology***

Powerco has developed a model of a nominal network that best represents its overall mix of customers and asset types. As Powerco operates a diverse group of networks both in terms of geographical layout and customer composition, there is no existing single network or network segment that could be used as a representative network for developing standalone costs. In some cases, there are too few residential customers on the network as a proportion of the total customer base; in others, commercial customers are underrepresented. Therefore, it is necessary to use a modelled representative network for the standalone cost analysis.

One way of constructing such a representative network would be to construct a model that includes all of Powerco's approximately 104,000 customers and has many different sub-networks made up of several thousand kilometres of pipe. However, there are practical impediments to completing this task.

Instead, Powerco has developed a nominal network based on average customer numbers and average lengths of network components. This approach is similar to using a scale model for wind tunnel testing – physical ratios are held the same, but the size is reduced to make computation of outcomes easier with no loss of accuracy. The practical outcome of this approach is a schematic representation of where customer loads are located relative to each other and their points of supply, as well as the pipes used as a means of conveyance.

This model has been developed within Powerco's SynerGEE modelling software, which allows calculation of pressure drops and gas flow velocities along pipes for given applied

loads (in scmh) and source pressures. This software also allows for the optimisation of network components to meet Powerco's quality of supply criteria, and hence determine the lowest cost model to serve a particular loading scenario.

This base model is then used as a starting point for developing further models to supply individual load groups and hence determine the standalone cost of supply. This is done by extracting the components necessary to supply the particular load group's load and then optimising the resulting network. The value of this network is then determined using the allowed replacement costs to give the standalone costs for supplying that load group.

### Model components

The nominal network has been constructed to supply an average number of customers from each standard load group using an average number of network components. Non-standard G30 and G40 customers are diverse in their network requirements and distance from the existing network, and they do not lend themselves to the averaging analysis inherent in the standalone cost methodology. However, they have been included in the model, as the model is also used to estimate incremental costs.

To determine average customer numbers for each load group, the total number of ICPs in each load group is divided by the total number of contiguous networks in the Powerco footprint. The typical loads (in scmh) assigned to each customer have been determined as follows:

- Residential G06 and G11 customers are assigned loads of 0.5 scmh. Commercial G12, G14, G16, and G18 customers have their loads capped equivalent to the mid-point of the flow rates allowed within the tariff band. Engineering judgment is used to adjust these loads for diversity, depending on the number of customers within each group. Groups with very few customers are left unchanged, whereas others are reduced by up to 50% as the number of customers increases. This approach is a conservative method of allocating peak loads for these groups.
- G40 customers are assigned a load equivalent to the average of the peak flows of the 20 TJ customers. Very minor adjustments to this assigned load are made applying engineering judgement.
- G30 customers have been assigned a proportion of the G40 customers' load based on the ratio between the total annual demands of each load group.

Average network components have been derived by calculating the average network length of MP mains and IP mains and then assigning appropriate pipe sizes to supply the nominal loads in the model. In this way, pipe sizes can be optimised to reflect the modelled load

being served, thus providing a more conservative estimate of standalone cost than if actual existing pipe sizes had been used.

### Full model construction

The full model is designed to provide adequate gas supply for all Load Groups at the same time. Adequate supply is defined as satisfying Powerco's operating pressure and quality of supply criteria:

- Under the modern equivalent assumption, the nominal operating pressure (NOP) of any IP segments is set to 1,500 kPa, and for MP segments it is set to 280 kPa.
- Under Powerco's quality of supply criteria, the maximum allowable pressure drop within any network is 40% of its NOP, which in these cases gives a minimum allowable pressure of 900 kPa for any point in the IP network, and 168 kPa for any point in an MP network. These quality criteria also limit the maximum gas flow velocity along any pipe to 20 ms<sup>-1</sup>.

The load groups are laid out such that the G30 customers are located near the Gate Station and supplied from a small MP network via a District Regulating Station (DRS) connected to the IP main. The G40 customers are located on the IP main directly or from laterals to either side of the main. This replicates the standard practice of positioning the gate station as close as possible to the major industrial loads.

At approximately the mid-point of the IP mains, a DRS reduces the pressure to supply a strip of commercial grade customers via an MP system, and it also supplies an interconnected mesh of residential grade customers. This replicates a common style of town planning that allows for commercial zoning between residential zoned land and industrial zoned land. The mesh also mimics the interconnectivity an established network develops through double siding and cross linking. A second group of commercial customers is supplied on the far side of the established residential customers via a DRS set up at the end of the IP main. More residential customers added to the MP network after this point represent newer subdivisions that were added as the notional town grew. These newer subdivisions have a lower degree of interconnectivity, as would be expected from the expansionary work at network extremities.

### Sub-system extraction

To evaluate the standalone costs by load group, each Load Group needs to be extracted from the base model. In this process, a copy of the nominal network is made for each load group and the assets not used to service the standalone load removed.

### Standalone optimisation

Each standalone model is optimised by reducing pipe diameters such that they are sized to supply only the Load Group's load. In some cases, sections of IP mains are replaced by MP network extensions where this configuration could adequately supply the load.

These optimisations result in the lowest cost set of assets that would meet the required loads without compromising Powerco's quality of supply criteria. The derived asset cost for each load group is then scaled up for each Powerco gas network region by the actual number of customers in that region.

### Standalone cost derivation

The annual depreciation and return on capital are then calculated for each load group in each region from that group's standalone asset costs, assuming a 60-year life of assets and applying the regulated WACC. These results are added to the other costs that have been allocated to that particular load group, including maintenance costs, local council rates, administration, and engineering support, to provide an annual standalone network cost for that load group. For the purposes of comparison, this figure is then divided by total annual GJ of gas consumed by that load group to obtain a standalone cost in \$/GJ.

This methodology provides a conservative estimate of standalone costs because:

- it evaluates standalone costs for an entire load group, rather than an individual customer;
- it does not include the cost of service pipes (individual connections), as they are difficult to model;
- it does not include the cost of a transmission connection point, which would be incurred by a standalone business;
- it uses optimised pipe sizes, rather than existing pipe sizes; and
- it assumes the standalone business will incur the same indirect costs that Powerco as a whole does.

### **Standalone cost methodology – non-standard gas distribution customers**

The modelling approach described above works for standard customers, because standard customers have similar characteristics and because the large number of standard customers means that using a model based on averages will yield meaningful results. This method cannot be used for non-standard customers, as there are large differences in customer characteristics and relatively few customer numbers. In statistical terms, non-standard customers have a skewed distribution in terms of customer characteristics and a small population size. Calculating a standalone cost based on averages will not yield a

meaningful result for these customers. This means that it is not possible to calculate a single standalone cost that would be representative of all G30 or all G40 customers.

However, individual bypass costs can be calculated for each individual G30 and G40 customer. It is Powerco's usual practice to ensure that non-standard prices recover their associated cost of capital and approximate the bypass costs for each G30 and G40 customer. These prices are then tested in the marketplace: in locations where there is competition from an alternate distribution service customers can choose between the prices offered by Powerco and the prices offered by the competitor. In locations where no bypass pipeline exists, customers still have a choice of whether or not to locate in that area and whether or not to use natural gas as a fuel source.

In situations where non-standard customers with a service capacity of less than 200 scmh would fit into a standard tariff category, there is the option of switching to that tariff if it represents a better value proposition for the customer. In situations where this is not possible (in the case of large industrial customers), customers can test the market when the original non-standard tariff expires. Customers with changed circumstances can also seek to modify the terms and conditions of their service agreements.

Hence, non-standard tariffs are carefully developed using bypass cost principles and are tested against the marketplace at a number of points. This process ensures that any non-standard tariffs Powerco maintains are not cross-subsidising other tariff categories: if prices were above market rates, the customer would go elsewhere.

### ***Incremental cost methodology – gas distribution***

Powerco evaluates the long run average incremental cost (LRAIC) of its gas distribution services using the following formula:

$$LRAIC = \frac{\sum_{i=1}^T \frac{I_i}{(1+r)^i}}{\sum_{i=1}^T \frac{\Delta M_i}{(1+r)^i}}$$

where:

$I_i$	= investment cost in year $i$
$T$	= planning horizon
$\Delta M$	= change in GJ relative to previous year
$r$	= discount rate

### Base Model

The network incremental cost methodology calculates load dependent incremental cost to the customer base of the full nominal network developed in the standalone cost methodology. This approach allows the modelling of the flow on effects of load increases to other parts of the network and hence any costs that might arise from required network reinforcements. This methodology also assumes that there is a correlation between annual demand (in GJ) and peak flow (in scmh).

Each load group is evaluated in isolation from the others. The peak demands of a given Load Group are increased annually between 2.0% and 8.0%, in order to generate peak load changes for that tariff group that trigger investment decisions within the analysis horizon. The reason different percentages are used is that some groups need to increase demand at a faster rate than others in order to trigger an investment within the 20 years used in the investment analysis. It would theoretically be possible to extend the period and keep the same percentage increase for all load groups but, as the incremental cost represents the floor of the economic envelope, a shorter period and higher percentage is a more conservative approach.

The corresponding loads are then determined and fed into the model. The model analyses the gas flows within the modelled network for compliance with quality of supply criteria. These criteria relate to maximum gas flow velocity (not to exceed  $20 \text{ ms}^{-1}$ ) and maximum pressure drop (to be no more than 40% of nominal operating pressure at any part of a network).

If the quality of supply criteria are met, then no investment is required for that modelled year and the analysis continues to the next modelled year. If the criteria are not met, then the model is suitably reinforced before the analysis proceeds to the next year.

This process continues for 20 iterations to give a 20 year investment profile for that load group. Twenty years was chosen as an appropriate long-term analysis horizon, as it provides a reasonable long-term horizon that was not unduly time-consuming to analyse. Further, as the incremental cost methodology uses the present value of future investments and volume increases, extending the analysis horizon into the future would have had little effect on the evaluated LRAIC.

### Incremental Cost Derivation

The required investment stream associated with the modelled reinforcements is then determined using the replacement costs of the network assets added to the model. These are the incremental capital costs of load growth over the 20-year analysis. (Incremental

operating costs are assumed to be negligible in this exercise.) These costs and the corresponding load growth (in GJ) are then evaluated according to the formula given above to obtain an incremental cost in \$/GJ.

#### 4.2.7 Compliance with the pricing principles

##### Summary of Compliance with Pricing Principles

Principle	Compliance
<p>1) Prices are to signal the economic costs of service provision, by</p> <p>a) being subsidy free (equal or greater than incremental costs, and less than or equal to standalone costs);</p>	<p>Powerco's prices fall within the subsidy-free range, as demonstrated by the charts shown in Appendix 1.</p>
<p>b) having regard, to the extent practicable, to the level of available service capacity; and,</p> <p>c) signalling, to the extent practicable, the impact of additional usage on future investment costs.</p>	<p>Coincident peak demand charging was considered, but would be impractical to implement for mass market customers. The ability to store gas in the network ("line pack") also undermines the economic case for coincident peak charging as higher peak demand does not necessarily trigger the need for additional capex.</p> <p>Locational capacity signalling is used in the case of high volume users and subdivisions located away from the existing network.</p>
<p>2) Where prices based on "efficient" incremental costs would under-recover allowed revenues, the shortfall should be made up by prices being set in a manner that has regard to consumers' demand responsiveness, to the extent practicable.</p>	<p>This pricing principle envisages the possible use of Ramsey pricing<sup>8</sup> or some form of coincident peak charging. However, Ramsey pricing is impractical as there is very limited information available on the price elasticity of demand for gas. In any event, distribution charges are invariably smaller than the charges for the energy that is consumed in conjunction with distribution services, so any price signals provided by the distribution charge are bound to be substantially diluted. With respect to coincident peak demand charging see the comment in the cell above.</p> <p>Powerco has tailored a new G06 residential tariff to reflect the preferences of small residential customers.</p>
<p>3) Provided that prices satisfy (1) above, prices should be responsive to the requirements and circumstances of users in order to:</p> <p>a) discourage uneconomic bypass, and,</p> <p>b) allow negotiation to better reflect the economic value of services and enable consumers to make price/quality trade-offs or non-standard arrangements for services.</p>	<p>Powerco offers non-standard tariffs to industrial and commercial customers to address the risk of bypass and to enable arrangements that are tailored to customers' needs.</p> <p>These tariffs are reviewed to ensure they do not exceed stand alone cost (as a proxy for bypass).</p>
<p>4) Development of prices is transparent, promotes price stability and certainty for consumers, and changes to prices should have regard to the effect on consumers.</p>	<p>Price stability and the effect of price changes on consumers have been important considerations when designing the pricing methodology and the future strategy. With few exceptions, price increases are less than 15 per cent of yearly distribution charges for all individual customers.</p>

<sup>8</sup> Ramsey pricing requires prices to be set in inverse proportion to the price elasticity of demand for the product concerned.

*Principle 1: Prices are to signal the economic costs of service provision, by*

*a) being subsidy free (equal or greater than incremental costs, and less than or equal to standalone costs)*

The methodologies for determining standalone and incremental costs are discussed in Section 4.2.6 above. Charts demonstrating that 2009 prices fell within the subsidy-free range are included in Appendix 1.

*b) having regard, to the extent practicable, to the level of available service capacity*

Please see section (c) below.

*c) signalling, to the extent practicable, the impact of additional usage on future investment costs.*

Economic theory suggests that efficient prices should ignore historical costs and only look forward to future investments; that is, prices should be based on long run marginal costs. According to this approach, prices should be low where the need for further investment is far in the future (and spare capacity exists). Prices should be high in cases when capacity is constrained and investment is needed in the near future. This approach contrasts with the average historical cost approach, which applies an accounting perspective to allocate operating costs, depreciation, and cost of capital to customer groups.

Powerco has considered these principles from a number of perspectives. The first consideration is, if prices are meant to signal capacity and the need for future investment, then to whom should these pricing signals directed and what action are they meant to prompt?

***Capacity-based pricing issues***

If the pricing signals are aimed at existing customers, then they should signal times of system peak, when additional consumption could trigger the need for new investment. Coincident peak demand pricing has been used with success in some situations to flatten electricity demand peaks and defer then need for network upgrades. However, there are a number of reasons why coincident peak pricing would be infeasible for Powerco's gas networks.

The first issue is that gas travelling through a pipeline has different delivery characteristics to electricity travelling through wires. Electricity cannot be stored, so demand has to be balanced instantaneously with generation at all times. This inflexibility necessarily leads to peaky consumption patterns – major peaks are observed in daily, weekly and annual consumption.

By contrast, reticulated gas systems do not tend to have such sharp peaks in consumption. Unlike electricity, natural gas can be stored, and it is often stored in transmission and distribution pipelines. At times of high usage, this stored gas (or “linepack”) is used to serve the demand for gas consumption. Because of the smoothing effect linepack can have on system peaks, there is less of a need for peak consumption to lead to greater network investment.

Further, the cost of reinforcing a gas distribution network is relatively low compared to the analogous investment in electricity. Gas distribution networks are designed for organic growth at the margins, and the cost of progressive upgrade is relatively uniform. Step increases in cost that restrict the ability to add new customers at the margins are rare. Even where upstream reinforcement of the network is needed, it can typically be completed in small incremental stages that balance the cost of upgrade against the value of additional customers added. This means that if a capacity charge were introduced, it would be small, as the costs of network reinforcement are small.

The third issue with coincident peak pricing is obtaining the data to implement such a pricing structure effectively. On the supply side, although Powerco monitors overall load on its networks, it is limited to periodic review of key network constraints. Monitoring actual network utilisation would require significant investment in new equipment, and Powerco considers that the cost of investment and monitoring would likely outweigh any potential benefits.

There is also a lack of appropriate data on the demand side of the market to implement a capacity charge. For this, one would need time of use consumption data, so that gas consumed during a specified time period, say 5p.m. to 7p.m., would be priced at a different rate to gas consumed the rest of the day. However, time of use data are not available for the vast majority of Powerco’s customers. Only very large industrial customers have a time of use meter. Converting Powerco’s mass market meters to time of use meters would be prohibitively expensive, even if one could find time of use meters sized for the residential market. The only information that Powerco has on its customers’ consumption is total units of gas consumed. Consumption data are not a good proxy for estimating customer peak demand.

Powerco therefore concludes that instituting a coincident peak demand charge in order to influence peak customer usage is neither warranted in the case of gas distribution nor practical from a data availability point of view.

### ***Locational capacity signalling***

Prices signalling capacity and the need to invest could also be targeted at potential gas customers, rather than existing gas customers. In this case, the signal might act as a means to influence potential customers' location decisions.

On a system level, as detailed in earlier, Powerco is experiencing decreasing numbers of gas connections and declining gas usage on its distribution network. These factors, coupled with the fact that the gas networks are designed and constructed to accommodate significant future growth in gas consumption, mean that there is a significant amount of unused service capacity within the distribution network as a whole.

Across network regions, the amount of spare capacity is similar, so there would be little to be gained by a regional capacity signal.

However, there are pockets within regions where service capacity can differ. For example, Powerco has needed to reinforce the gas network pipe that feeds the Churton Park suburb of Wellington. This pipe was originally installed over thirty years ago, when the suburb was much smaller. The population growth of this region and its uptake of reticulated natural gas have since meant that the original pipe needed replacing with a larger one. This is an example of an instance where gas distribution prices to Churton Park residents could have had regard to the decreasing levels of service capacity in that suburb and prices could have signalled the effect of additional usage on future investment costs.

However, this outcome, while based on sound economic principles, would be impractical to implement. Developing and maintaining prices on a suburb-by-suburb basis would be an administrative burden, both for Powerco and for the retailers who sell gas on Powerco's network. More importantly, such a proliferation of tariffs would be confusing from a customer point of view.

More fundamental is the question of how potential residential customers are supposed to react to these potential pricing signals. To be effective, a pricing signal has to be proportionate to the decision it is designed to affect. It is difficult to believe, for example, that a prospective homeowner would use the differential prices of gas between two different suburbs as a deciding factor in choosing a house to purchase. Equally, a prospective restaurant owner would probably not be influenced by different gas prices when deciding on a restaurant location. Even if the relevant decision were whether or not to connect to reticulated gas, it is difficult to imagine that the distribution pricing differential would be able to be distinguished in the retail tariff. Indeed, Powerco considers it unlikely that retailers

would elect to pass through such suburb by suburb pricing, even if Powerco did structure its tariffs on this basis.

Further, implementing such a structure may lead to price instability and uncertainty for customers. Again taking the example of Churton Park, once the pipeline is upgraded, then there would again be spare capacity in that region, meaning prices should fall. Powerco believes that tariffs should be constructed in a way that smooths such localised cost differences and provides a consistent, equitable price across the region.

There a few groups of prospective gas customers for whom price signalling of capacity is a meaningful and feasible exercise: high volume users and subdivisions located away from the existing network.

In the case of high volume users, it is Powerco's practice to consider capacity constraints and necessary upgrades when developing a non-standard tariff proposal for a prospective new large industrial or commercial customer. These proposals are necessarily location-specific and signal the level of available service capacity and any new investment required to supply the prospective customer with the required service. In some cases, prospective customers are considering more than one location, and different pricing proposals are developed for each, reflecting the different costs that Powerco would face to construct the connection and any necessary reinforcements.

Potential subdivisions located away from the existing network are similarly evaluated to ensure that Powerco can adequately recover its cost of capital. In this case, Powerco may require a capital contribution to connect the subdivision to its network. This capital contribution signals the investment costs without the complexity of a proliferation of new tariffs.

*Principle 2: Where prices based on 'efficient' incremental costs would under-recover allowed revenues, the shortfall should be made up by setting prices in a manner that has regard to consumers' demand responsiveness, to the extent practicable.*

Setting prices based on a precise definition of price responsiveness, or price elasticity of demand, is difficult for gas distribution businesses for a number of reasons. First, robust and relevant information on price elasticity is extremely difficult to obtain, as the Commission itself stated in the Gas Control Inquiry.<sup>9</sup> Few studies have been done in New Zealand; and the results of studies conducted in other countries may not be applicable in the New Zealand context.

Second, price elasticity, strictly speaking, is the change in volume consumed in response to a small change in price. In Powerco's experience, the risk with increasing gas prices is less about volumes consumed as it is about customer disconnections. As explained previously, Powerco has experienced episodes when large numbers of customers disconnected in response to a sudden increase in the fixed daily gas tariff. Consequently, Powerco needs to be cautious when changing the price signals it sends to its connected customers.

The third difficulty with considering price elasticity of demand in a formal way is that customers respond to final prices but distribution represents only a portion of the final prices. Retailers re-bundle distribution prices, as well as wholesale gas and retail costs, into a final retail tariff for their customers. In many cases, the structure of distributors' prices – the extent to which tariffs are charged on a daily or per unit of energy basis – is changed by the retailers. It is therefore very difficult to discern customers' responses to changes in distribution prices.

However, Powerco is very concerned about the potential impact of its prices on its customers. In Powerco's experience, customers can be very sensitive to reticulated gas prices: as outlined above, there have been instances when an increase in the fixed portion of residential retail gas tariffs has led to a significant number of disconnections. Powerco's price setting therefore addresses the issue of demand responsiveness from the perspective of experience, rather than a quantitative assessment of price elasticities of demand.

It is Powerco's perception that the small residential customers are the most vulnerable of its customer groups. Customers consuming less than 15 GJ of gas per year are likely to be using gas for only one or two small applications: cooking, perhaps, or a small gas heater. These applications could be easily converted: gas cooktops can run on LPG gas with only minor modifications; small gas heaters can be replaced with electric ones.

Consequently, a tariff aimed specifically at small residential customers has been created (G06). This tariff, which is fully variable with no fixed daily charges, is the most economical choice for customer using less than about 15 GJ of gas per year.

For the remaining customer classes, it is not known how customers will respond to any price increases. Powerco therefore aims to take a prudent approach and implement price changes cautiously, so that retailer responses and customer reactions can be gauged before any subsequent pricing changes are determined.

Principle 3: Provided that prices satisfy (1) above, prices should be responsive to the requirements and circumstances of users in order to:

a) discourage uneconomic bypass, and

b) allow negotiation to better reflect the economic value of specific services.

Powerco offers non-standard tariffs to industrial and commercial customers to address the risk of bypass and to enable arrangements that are tailored to customers' needs. There are generally two groups of such non-standard customers: large industrial customers that require capacities greater than 200 scmh (G40 customer group), and smaller commercial and industrial customers located near a bypass pipeline (G30 customer group).

A number of criteria are considered when developing prices for non-standard customers. For new customers, the process involves an assessment of the costs of constructing a new connection to Powerco's network and of the revenue required to support such an investment. Other factors include an assessment of the estimated demand of the new customer, the likely stability of the business (and therefore the risk the Powerco is taking on in building dedicated assets for it), the length of the contract period, and other market information.

For customers that fall within the defined consumption and capacity ranges of standard customers, Powerco compares the developed non-standard price with the standard price in the relevant customer category; the new customer is offered the lower of the two. For large industrial customers, the developed non-standard tariff is presented as a proposal; the possibility of bypass means that industrial customers generally are able to choose between two or more price offers. In this way, any non-standard tariff is tested by comparison to alternative pricing arrangements, and only those prices that represent the best value to customers are put into place.

For existing non-standard customers, there is no investment decision on Powerco's part, as the connection assets have already been constructed. The expiration of a non-standard pricing contract provides a point at which non-standard customers can revisit the terms of their supply agreement with Powerco and ensure that their network services are consistent with the requirements of their businesses.

While Powerco enters into direct discussions with large (G30 and G40) customers in a number of instances, Powerco's price discussions are generally with the retailers that represent the large customers. In these cases, Powerco considers the retailers to be acting as the agents for the large customers and seeking to ensure the best deals for their customers.

By this process, Powerco discourages the uneconomic bypass of its network and allows negotiation to tailor its services to the specific needs of businesses. Powerco expects to continue this practice.

#### **4.3 APPROACH TO SETTING PRICES FOR NON-STANDARD CONTRACTS**

Powerco may offer non standard tariffs to large commercial and industrial customers in response to customer preferences or to address by pass risk. Non standard tariffs may be offered to customers that satisfy the following criteria:

- commercial and industrial consumers that require capacity of more than 200 scmh with more than 10 TJ of annual consumption (G40 load group);
- commercial and industrial consumers that are located near to a potential bypass pipeline (G30 load group) with consumption of less than 10 TJ per annum.

Considerations that may be taken into account when developing non standard tariffs are:

- specific customer needs and preferences, such as load requirements, estimated usage and specific location of investment;
- the most effective and efficient network solution and design to meet consumer requirements, including the capacity of the existing Powerco network to supply the customer's needs;
- the cost of constructing a competitive network solution, and
- the investment risk for Powerco associated with constructing a dedicated network solution for the customer. This assessment would include the risk associated with the customer's business and the period that the consumer would be willing to commit to remain connected to the Powerco network. For a higher risk business the contract price may be set with higher fixed component and the contract period may be shorter.

#### **4.4 POWERCO'S OBLIGATIONS AND RESPONSIBILITIES TO CUSTOMERS ON NON-STANDARD CONTRACTS IN THE EVENT THAT THE SUPPLY OF GAS PIPELINE SERVICES TO THE CUSTOMER IS INTERRUPTED**

Powerco does not differentiate non-standard (G30-G40) customers from standard customers with respect to interruption to supply. Basic load shedding categories are industry set / driven and the status of customers at a ICP level are held in the Gas Industry Company's gas registry.

#### **4.5 ICPS REPRESENTED BY NON-STANDARD CONTRACTS AND TARGET REVENUE FROM NON-STANDARD CONTRACTS**

The number of ICPs covered by non-standard contracts is currently 204 and the target revenue anticipated from non-standard contracts in 2012/13 is \$4,641,735.

#### **4.6 THE VIEWS OF CONSUMERS**

To date, Powerco has not undertaken any direct consultation with end customers about variations in distribution prices and quality. The main reason for not doing so is that, for mass market customers, changes to distribution prices do not flow through to end use customers in a transparent way – how final charges are set is determined by the retailers. However, Powerco does conduct market research (via both focus groups and customer interviews), which helps to identify forms of pricing which may create barriers to the uptake of gas. Customers have identified increases in fixed charges as the largest barrier to the use of gas.

## 5. EXCLUDED SERVICES

### 5.1.1 Definition

Excluded services on Powerco's gas network include connection of new customers, reconnection, disconnection, and decommissioning services.

These services fall into two general categories: those services that will lead to increased future revenues and those that will not. For services that lead to future revenues, Powerco's approach is to weigh the cost of providing the service against future expected revenue from the site. In many cases, Powerco will charge a price that is less than its cost of providing the service, in recognition of the expected future revenue stream.

For services that do not produce future revenue, such as disconnection and decommissioning, Powerco charges a price that reflects the costs that Powerco incurs in providing the service.

Powerco's excluded services and pricing approach are summarised in the tables below.

#### Excluded Services

	Definition	Approach
<b>Category: Service will provide increased future revenues</b>		
New Connection Services	To establish a new point of connection	Powerco will make a contribution to the cost
Reconnection Services	To reinstate a connection where an accessible point of connection exists	Powerco will make a contribution to the cost
<b>Category: Service will not provide increased future revenues</b>		
Disconnection Services	To disconnect the Gas Metering System and to plug the riser (service pipe)	Price based on cost recovery
Decommissioning Services	To disconnect and to cap the service main at a decommissioned point of connection	Price based on cost recovery

For new residential connections, the charges payable by the retailer depend on the:

- Nature of the connection (standard or non-standard, defined below);
- Length of the service pipe required; and
- Nature of the load being connected.

For new commercial and industrial connections, Powerco will consider connection charges on a case by case basis.

Standard residential connections are those that satisfy the following conditions:

- Gas main is in the street
- Gas main runs past the property needing a connection
- Gas main is on the same side of the road as the property needing a connection.

Standard connections have established prices. Non-standard connections may entail such factors as gas mains extension, road crossing, long service pipes, installation on a steep section, or a creek or river crossing. These connections are considered on a case by case basis and the charge is based on the actual time and material required to connect the customer and the expected customer load.

#### **5.1.2 Medium Term Price Strategy for Excluded Services**

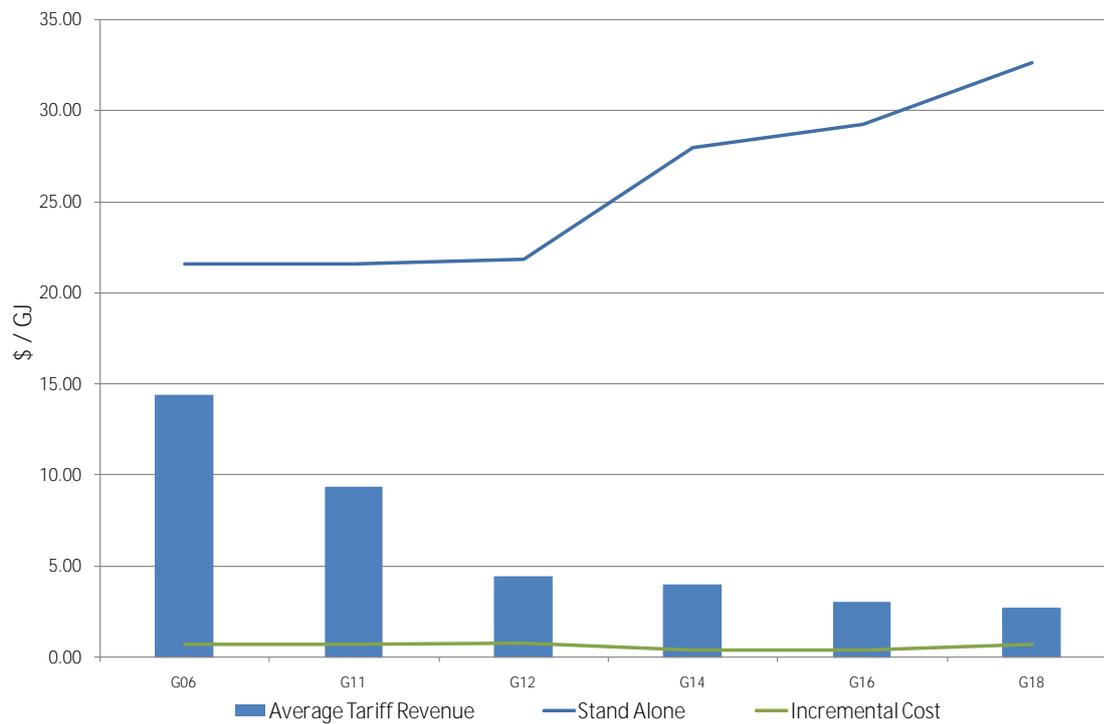
In the medium term, Powerco intends to maintain its policy of making a contribution to the costs of those services that have a future revenue stream associated with them, such as connections, reconnections, and meter upgrades. For other services, Powerco intends to charge a price that reflects its own costs in performing the service.

Powerco intends to review its prices for these services periodically to ensure that they are still reflective of the costs that Powerco incurs.

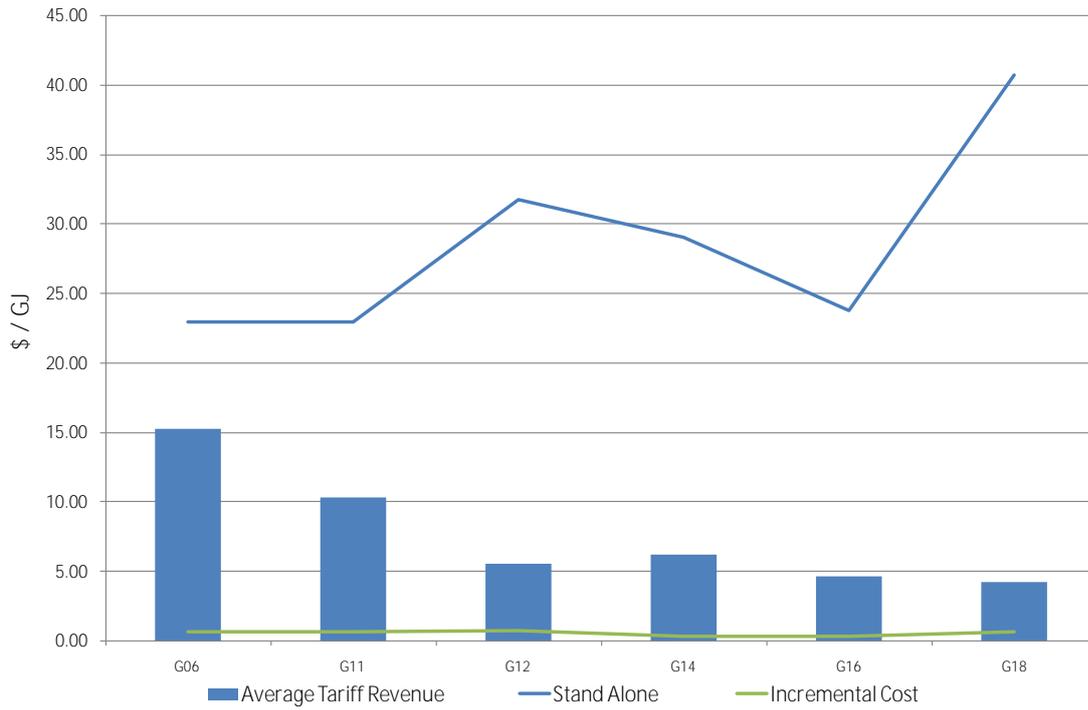
## APPENDIX 1: ESTIMATES OF SUBSIDY FREE PRICES FOR STANDARD NETWORK CLASSES

This section sets out the results of analysis of the 2009/10 stand alone and the incremental cost of supply, against the average tariff revenue per GJ. The network charges fell well within the subsidy-free range at that time and this finding is unlikely to have changed in the intervening period. This analysis will be updated once the network model is updated later in 2012.

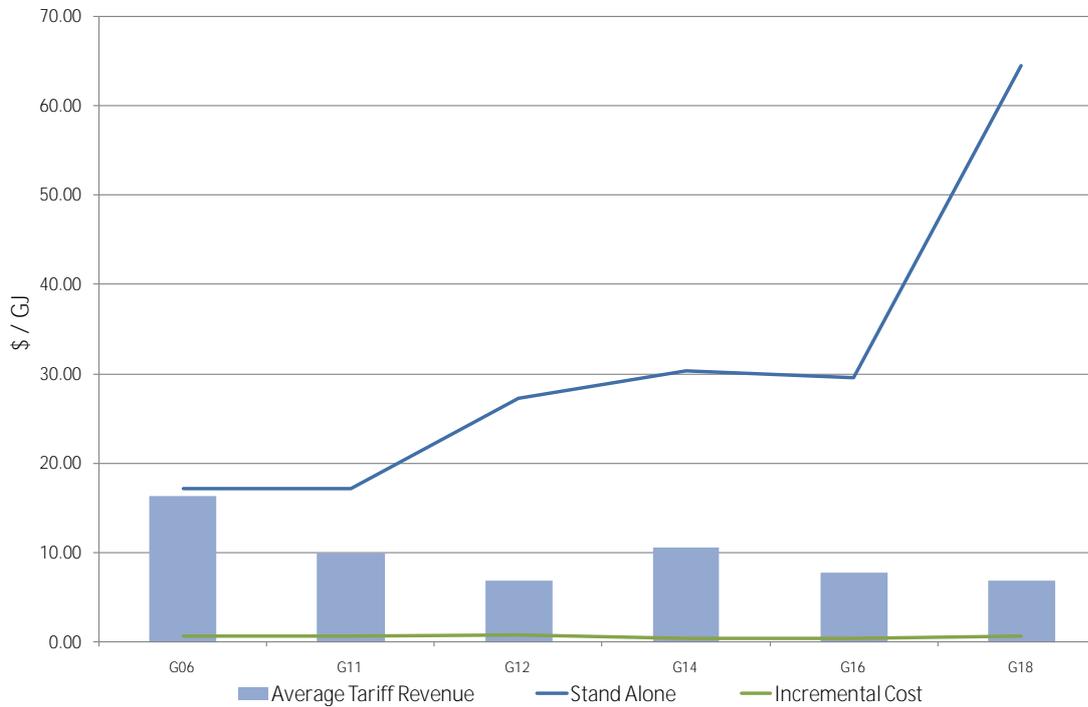
### Hawke's Bay Gas Network – 2009/10



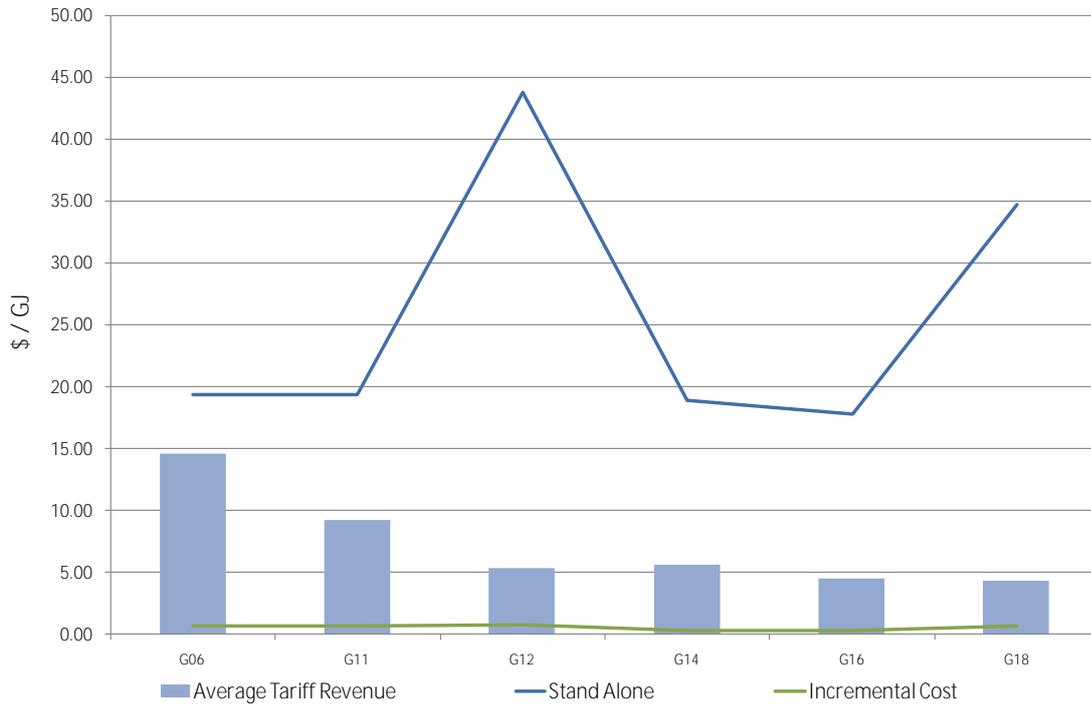
**Manawatu & Horowhenua Gas Network – 2009/10**



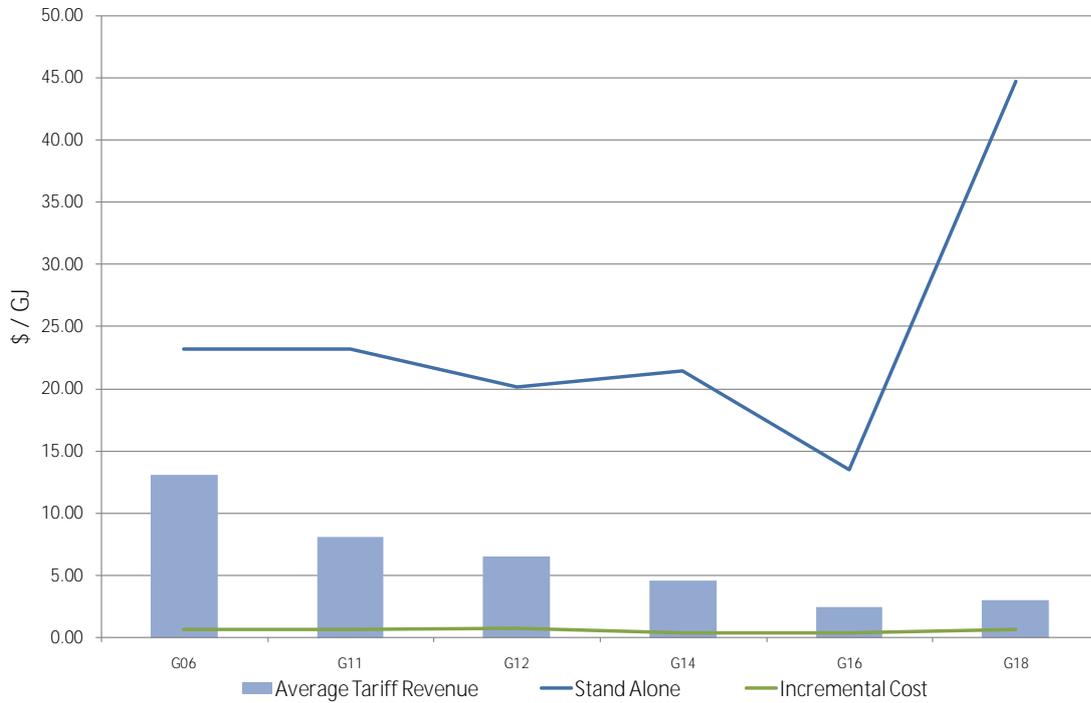
**Wellington Gas Network– 2009/10**



**Hutt Valley & Porirua Gas Network– 2009/10**



**Taranaki Gas Network– 2009/10**



## APPENDIX 2: TARGET REVENUE FOR 2012/13 AND THE PROPORTION OF THE TARGET REVENUE THAT IS COLLECTED BY EACH TARIFF TYPE

Target revenue for 2012/13: \$46,079,469

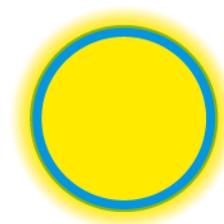
### Recovery of target revenue by tariff type

Load Group	Fixed Revenue	Variable Revenue	Total Revenue
<b>G06</b>	0	5,026,858	5,026,858
<b>G11</b>	14,019,716	13,836,829	27,856,544
<b>G12</b>	528,914	1,778,536	2,307,450
<b>G14</b>	957,562	1,719,263	2,676,825
<b>G16</b>	651,317	2,139,195	2,790,511
<b>G18</b>	221,611	557,934	779,546
<b>G30/G40</b>	1,662,781	2,978,955	4,641,735
<b>Total</b>	<b>18,041,901</b>	<b>28,037,569</b>	<b>46,079,469</b>

Note: figures may not sum exactly due to rounding.

**CERTIFICATE FOR DISCLOSURES AT THE BEGINNING OF A PRICING YEAR**  
Pursuant to clause 2.9.2

**POWERCO**



We, Richard Gilbert Bettle, and Stewart John Upson, being directors of Powerco Limited certify that, having made all reasonable enquiry, to the best of our knowledge-

- a) the following attached information of Powerco Limited prepared for the purposes of clause 2.4.1 of the Gas Information Disclosure Determination 2012 in all material respects complies with that determination
- b) The prospective financial or non-financial information included in the attached information has been measured on a basis consistent with regulatory requirements or recognised industry standards.

\_\_\_\_\_  
Director

27 February 2013

\_\_\_\_\_  
Date

\_\_\_\_\_  
Director

27 February 2013

\_\_\_\_\_  
Date