



Pricing Methodology for Gas Distribution Services

Effective from 1 October 2013

Pursuant to: the Gas Distribution Information Disclosure Determination 2012, NZCC23, 1
October 2012.

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Glossary

Act: the Commerce Act 1986.

Allowable notional revenue: the revenue Vector determined under the GDPP that Vector is allowed to earn during the pricing year.

Authorisation: the Commerce Act (Vector Natural Gas Services) Authorisation 2008.

Connection Type: All consumers connect to the gas network via three types of connections: Primary (P), Secondary (S) or Tertiary (T) connections.

COSM: Cost of Supply Model.

CPI: the Consumers Price Index, a measure of changes to the prices for consumer items purchased by New Zealand households giving a measure of inflation.

Determination: the Gas Information Disclosure Determination 2012.

GDPP: the Gas Distribution Services Default Price-Quality Path Determination 2013.

ICP: is an installation control point being a physical point of connection on a local network which a distributor nominates as the point at which a retailer will be deemed to supply gas to a consumer.

kWh: kilowatt-hour, a unit of energy being the product of power in watts and time in hours.

Price Component: the various prices, fees and charges that constitute the components of the total price paid, or payable, by a consumer.

Pricing Principles: the pricing principles specified in clause 2.5.2 of the Gas Distribution Services Input Methodologies Determination 2010 (Commerce Commission Decision 711, 22 December 2010).

Pricing Strategy: a decision made by the Directors of a GDB on the GDB's plans or strategy to amend or develop prices in the future, and recorded in writing.

Pricing Year: the annual period beginning on 1 October and ending on 30 September

Primary Connection type: consumers who connect directly to the "A" assets (backbone) by means of their own connection assets. Currently there are no "P" connection types.

RAB: Regulatory Asset Base, the regulated value of the assets that Vector uses to provide gas distribution services.

scm/h: standard cubic metres per hour a measure of gas capacity based on the flow rate

Secondary Connection type: consumers who connect directly to the "A" assets (backbone) by means of Vector owned connection assets ("B" assets). The small number of Secondary Connection types are mostly made up of consumers with large gas usage.

Target revenue: the revenue Vector expects to receive from prices during the pricing year

Tertiary Connection type: consumers who connect to the "C" assets (meshed distribution). Most consumers are connected via Tertiary Connections.

Executive summary

Pursuant to clause 2.4 of the Gas Distribution Information Disclosure Determination 2012, issued by the Commerce Commission 1 October 2012, Vector is required to disclose aspects of its pricing methodology and demonstrate how (and if not why) prices have been set consistent with prescribed pricing principles. The information in this document addresses those requirements.

Vector's overall revenue level is subject to the Gas Distribution Services Default Price-Quality Path Determination 2013 (the GDPP) that requires an initial starting price adjustment applied in 2013 and a CPI-X plus pass-through price path. The Cost of Service Model (COSM) used by Vector identifies the revenues that would be necessary from each consumer group within the constraint of the GDPP.

There are a myriad of factors that contribute to the overall level of network costs, this limits the extent to which Vector can accurately attribute costs and therefore cost allocation requires a high level of aggregation.

Vector has also adopted a framework where the costs allocated to each consumer group are tested against the cost of alternative energy supplies. This ensures that cost allocations do not arbitrarily result in prices that are sufficiently high that consumers have an incentive to disconnect and use alternative energy sources. This benefits all consumers of natural gas distribution services by providing a pricing structure that encourages broad uptake of distributed natural gas, thereby resulting in shared network costs being spread across as many consumers as possible.

At the same time, the pricing principles require that Vector demonstrates that prices are not less than incremental cost, that is are "subsidy-free". Vector has interpreted this requirement broadly. A narrow interpretation can result in very low estimates of incremental cost. Vector's interpretation estimates incremental cost for an entire consumer group, thereby including more shared network assets in the estimate. This document demonstrates that price for all consumer groups are greater than incremental cost.

In setting prices for the pricing year beginning on 1 October 2013, Vector has simplified its consumer groups to reflect capacity bands. The previous price structure incorporating zonal and pressure system has been removed. Vector recognises the impact of price changes on its consumers. The new prices have been subject to consultation with retailers (as consumer representatives), and the ratio of fixed daily charges and variable charges for residential consumers gas been modified as a result.

Section 1 Overview

1.1. Background

Vector's Auckland gas distribution business was subject to the Commerce Act (Vector Natural Gas Services) Authorisation 2008 (the Authorisation) until 1 July 2012. Amongst other things, the Authorisation incorporated an initial starting price adjustment applied in 2009, a CPI-X plus pass-through price path and a requirement to set prices in accordance with regulated pricing principles. Vector's North Island gas distribution network was only subject to an interim price path under the Commerce Act 1986 (the Act) that allowed for CPI increases but did not have any requirement to set prices using regulated pricing principles.

From 1 July 2013, Vector's Auckland and North Island gas distribution networks are subject to new regulation: the Gas Distribution Services Default Price-Quality Path Determination 2013 (the GDPP) that requires an initial starting price adjustment applied in 2013 and a CPI-X plus pass-through price path. In addition, the Gas Distribution Information Disclosure Determination 2012 (the Determination) also requires Vector to demonstrate how (and if not why) prices have been set consistent with prescribed pricing principles.

Under the Authorisation, Vector transitioned from a zonal based pricing structure to a set of prices comprised of three groups determined by the gas distribution pressure system that consumers connected to (referred to as connection types), with capacity bands within these connection types. The prices that resulted from this process has ultimately resulted in a price structure that contains different prices based on the pressure of the gas distribution service supplied to the consumer's meter.

Vector has now further simplified gas distribution pricing to be independent of the gas distribution pressure system. In most cases consumers have no choice on the pressure system they connect to and the service they receive does not change based on the delivery pressure. In practice the prices between each delivery pressure were materially the same to the point they would be unlikely to influence consumer decisions on which system to connect to (if such a choice was available). Given no material difference in prices on the pressure systems and little or no ability for consumers to make the choice between pressure systems, Vector has amalgamated prices across connection types. The result is that gas distribution prices are now based on uniform capacity bands regardless of location or pressure system.

1.2. Applicable regulations

This disclosure is prepared in accordance with clause 2.4 of the *Gas Information Disclosure Determination 2012*, Decision NZCC23, 1 October 2012 (the Determination). Compliance with the requirements of this clause is demonstrated in the compliance matrix in Section 6.

Vector's target revenue for gas distribution services is set in accordance with the *Gas Distribution Services Default Price-Quality Path Determination 2013*, [2013] NZCC4, 28 February 2013 (the GDPP).

The pricing principles are specified in clause 2.5.2 of the *Gas Distribution Services Input Methodologies Determination 2010* (Commerce Commission Decision 711, 22 December 2010).

1.3. Additional disclosures

Vector's gas distribution prices are subject to annual approval by Vector's Board of Directors, and are set to comply with the GDPP and deliver the target revenue.

Vector's Board of Directors have not recorded in writing any decision on plans or strategies to amend or develop prices beyond the pricing year ending on 30 September 2014 and accordingly have not approved a pricing strategy.

1.4. Price setting policy framework

1.4.1. *Economic, commercial and practical drivers*

In this section we highlight some of the key factors that have influenced the design of Vector's proposed pricing approach. The development of the proposed prices is based on an application of economic pricing principles, given practical, physical and commercial constraints. It is useful to have an understanding of these factors up front, as it assists in understanding various decisions Vector has reached in establishing the pricing methodology.

The majority of costs to be recovered are shared costs, which cannot be specifically attributed to particular consumers except at high levels of aggregation

There is a substantial network cost to be recovered made up of highly meshed or interconnected assets. Within the network consumers are not generally geographically segmented in their use of different network assets. For example, there are not purely "industrial zones" or "residential zones" where there is no possibility of intermingling of consumers with different requirements. In Appendix 1, we provide a GIS-generated representation of the Auckland network that illustrates this point. A key feature of the network is that consumers are highly intermingled; a residential consumer consuming only 20 GJ of gas per year can be using the same network as a commercial consumer consuming 100 TJ (5000 times the residential consumer).

The intermingling of consumers has had significant implications for the development of network prices. First, it means that there are substantial common costs, so a substantial proportion of the prices paid by consumers are a recovery of common costs rather than being directly attributable to the provision of a specific service to that consumer. There are inevitably judgements that have to be made in determining appropriate allocation approaches. This feature has constrained the scope of the Cost of Supply Model (COSM) to high levels of aggregation, with more general "cost reflectivity" principles applying to the manner in which prices have been developed consistent with the aggregated cost allocations.

There are practical limits on the sophistication of prices to improve efficiency

Vector generally contracts indirectly with consumers through gas retailers and in effect provides a wholesale distribution service to retailers. Retailers are then free to repackage the cost of Vector's distribution service as they see fit, meaning it is not necessarily the case that price signals inherent in Vector's prices make their way through to the consumer. In any event, gas distribution costs make up only 25-30% of the average (residential) consumer's bill, so any price signal at the distribution level will tend to be overwhelmed by energy and transmission charges¹.

¹ Note that gas transmission charges are paid for directly by shippers who are generally also gas retailers.

The small size of most possible consumer groups restricts the ability to design a highly granular cost allocation model which directly calculates required revenues for each consumer group

Another factor that has impacted on the development of the cost of service/cost allocation model is the small size of many of the existing consumer groups. Of the total consumer base² of 157,035 consumers, the majority of these are residential consumers (147,347) with the other consumer numbers (based on the existing price structure) as follows:

Table 1 Number of consumers by price plan

Auckland Network		
2013 price plan	Description	ICP count
GA0R	Residential	87,158
GA01	Less than or equal to 10 scm/h	2,271
GA02	Greater than 10scm/h and less than or equal to 40scm/h, 40scm/h, located in pricing zone 0	2,238
GA12	Greater than 10scm/h and less than or equal to 40scm/h, 40scm/h, located in pricing zone 1	191
GAS3	Greater than 40scm/h and less than or equal to 200scm/h and a nominal operating pressure higher than 420kPa.	96
GAT3	Greater than 40scm/h and less than or equal to 200scm/h, and a nominal operating pressure equal to or less than 420kPa.	769
GAS4	Greater than 200 scm/h, with a nominal operating pressure higher than 420 kPa.	20
GAT4	Greater than 200 scm/h, with a nominal operating pressure equal to or less than 420 kPa.	109

² Consumer numbers are correct as at June 2013. The zones and pressure systems within each capacity band have been aggregated from 1 October 2013

North Island Network		
2013 price plan	Description	ICP count
GN0R	Residential	60,189
GN01	Less than or equal to 10 scm/h	2,120
GNS2	Greater than 10scm/h and less than or equal to 40scm/h with a nominal operating pressure higher than 420kPa	8
GNT2	Greater than 10scm/h and less than or equal to 40scm/h with a nominal operating pressure equal to or less than 420kPa	1,325
GNS3	Greater than 40scm/h and less than or equal to 200scm/h with a nominal operating pressure higher than 420kPa	14
GNT3	Greater than 40scm/h and less than or equal to 200scm/h with a nominal operating pressure equal to or less than 420kPa	484
GNS4	Greater than 200 scm/h, with a nominal operating pressure higher than 420 kPa.	5
GNT4	Greater than 200 scm/h, with a nominal operating pressure equal to or less than 420 kPa.	38

Because of the small size of a number of the consumer groups and the inability to separate out different assets as being used solely by different consumers, this has made the development of a highly granular cost allocation model that directly calculates prices or required revenues for each consumer group impractical.

The move to a simplified set of prices based solely on capacity reflects the underlying cost drivers, recognises the limits of sophistication in cost allocation, and also recognises the practical limits on the data available to Vector.

When aggregated, these prices conform to the cost allocation model outputs and the requirements of the weighted average price cap. The development of these prices has been informed by general considerations relating to economies of scale and cost causality.

Development of prices necessarily requires a high level of averaging

There are a myriad of factors that contribute to the overall level of network costs, including, but not limited to distance, consumer density, variations in ground conditions, consumer demand profiles, traffic management conditions, age of the network, incidence of other utilities in the road (can cause additional costs of relocating assets), and territorial authority requirements which differ across the distribution network. It is not practicable to take all these different cost drivers into account in designing network prices, and, therefore, there is necessarily a high degree of averaging in developing prices to recover the overall costs. Reflecting "cost causality" in prices is achieved only in a general sense and price design is necessarily limited to reflecting a few key cost concepts to manage the overall complexity of prices.

The development of Vector's price structure has accordingly focussed on:

- Ensuring price are set within the subsidy free range (greater than IC and less than SAC);
- Cost reflectivity in the design of consumer segments;
- A price structure that creates incentives for retaining and attracting consumers, including appropriate fixed/variable splits and non-standard agreements. Consumers will benefit most from increased economies of scale and density over time as more consumers share the substantial costs of the core network;
- Reflecting economies of scale in pipeline capacity augmentation; and
- A design that once implemented will be stable over time.

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Section 2 Commercial price-setting framework

2.1. Competitive pressures on pricing

The starting point for establishing prices for gas distribution services is a consideration of the role of gas as a fuel. Unlike electricity, for most consumers the choice to take gas in the first instance and at discrete points in time is discretionary. Given the substantial costs of laying the distribution network, there is a strong commercial drive on Vector to maintain and improve economies of density (more consumers per unit of pipeline) and economies of scale (more kWh delivered per unit of pipe). Improved economies of scale and density mean that Vector can use its capital more efficiently and consumers ultimately benefit from the sharing of common costs across a wider number of consumers or gas delivered. A more diverse consumer base is also in Vector's commercial interests as it mitigates asset stranding risks.

2.2. Pricing against alternative energy sources

A key part of Vector's pricing methodology is testing proposed prices against the lowest cost alternative energy source.

In 2012 Vector asked PricewaterhouseCoopers (PwC) to calculate an implied cap for gas transmission based on the cost of alternative fuels. The same data can be used to calculate an implied cap for gas distribution using the approach summarised in Figure 1. The implied cap for gas distribution costs is a proxy for the maximum prices that could be charged for gas distribution before the cost of an alternative fuel is less than the cost of natural gas. The reasonableness of the cost estimates were reconfirmed in light of CPI and current pricing and costs.³

Figure 1 Calculation of implied distribution cost

All-in delivered cost of alternative
<i>Less</i>
– GST
– replacement capital expenditure (annualised)
– gas cost
– retailer margin
– gas transmission cost
– other costs
<hr/>
= Implied cap on gas distribution cost
<hr/>

³ Consumer information websites such as <https://www.powerswitch.org.nz> & <http://www.smarterhomes.org.nz> were used in this analysis.

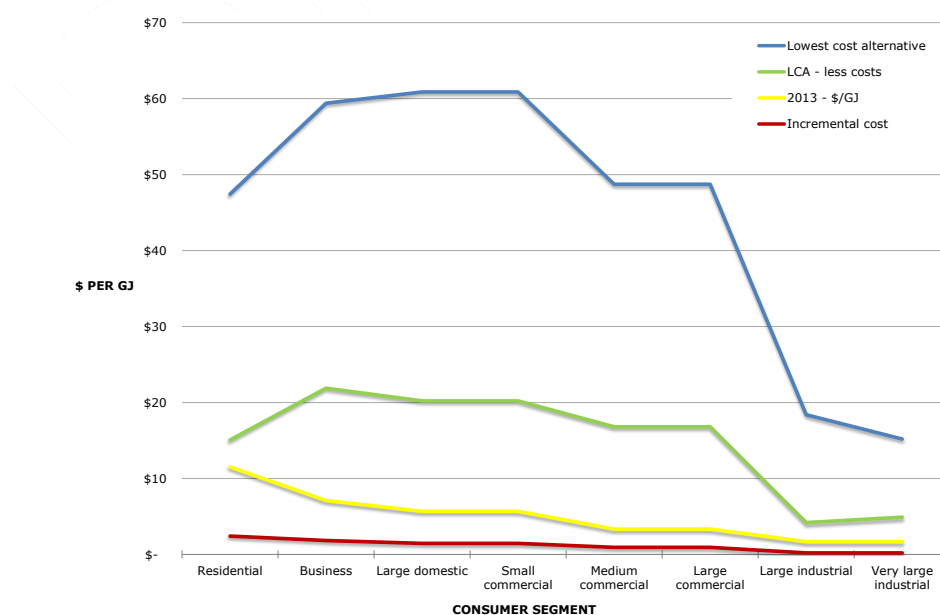
Bottled LPG, biomass, and coal were the alternative fuels examined. For each consumer group the lowest implied distribution cost was selected across the three fuels. As shown in Table 2, bottled LPG provides the implied distribution cap for domestic and commercial consumers, and coal provides the implied distribution cap for industrial consumers. Other options such as solar & wind were also considered but given the take-up required from each segment and the high cost of initial set up these options were not carried forward. Note also that the level of consumer segmentation considered in Table 2 is more granular than the consumer groups adopted for pricing purposes.

Table 2 Implied distribution caps based on the cost of alternative fuels

Consumer type	Lowest cost alternative	Alternative fuel	LCA less costs
Small domestic	47.43	Bottled LPG	15.07
Medium domestic	59.38	Bottled LPG	21.88
Large domestic	63.53	Bottled LPG	19.65
Small commercial	58.21	Bottled LPG	20.78
Medium commercial	51.45	Bottled LPG	15.57
Large commercial	46.00	Bottled LPG	18.03
Large industrial	18.40	Coal	4.20
Very large industrial	15.20	Coal	4.90

The results of the comparison are shown in Figure 2 below. The blue line shows the assessed cost of the lowest cost alternative. Deducting the relevant costs arrives at the green line which is the implied maximum cost of gas distribution services.

Figure 2 Comparison of average gas prices against lowest cost alternative



The gap between gas distribution services and the lowest cost alternative (LCA less costs) is the least for residential and industrial consumers: because consumers are not homogenous this means that for some consumers in those categories there will be a lower cost alternative than natural gas. There are limits to the extent to which a standardised pricing schedule can take account of the particular circumstances of individual consumers, so in certain circumstances large (industrial) consumers are able to enter into a non-standard contract as described in Section 5.

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Section 3 Methodology for standard prices

This section describes the methodology that Vector has applied for calculating prices for controlled gas distribution services.

The consumer groups used by Vector are described in Section 3.1. Section 3.2 describes the operation of the Cost of Service Model (COSM) that Vector uses to allocate costs to the consumer groups. Because Vector operates under a weighted average price cap, the costs that are inputs to COSM will not necessarily add to the amount of the weighted average price cap. The allocated costs are therefore used to establish the proportion of the target revenue that is recovered from each consumer group. The allocation of target revenue is described in Section 3.3 and any resulting price changes are described in Section 3.4.

3.1. Consumer groups

Regulatory requirement

2.4.3(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**;

In the previous pricing methodology consumers were segmented into Primary, Secondary, and Tertiary connection types based on the pressure of the gas distribution system they connected to. However, there are no consumers that met the Primary connection type definition, and only a small number that met the Secondary connection type definition, with the vast majority of consumers being tertiary connection type consumers.

In most cases consumers have no choice on the gas distribution pressure system they connect to and the service they receive does not change based on the delivery pressure. In practice the prices between each delivery pressure were materially the same to the point they would be unlikely to influence consumer decisions on which system to connect to (if such a choice was available). Given no material difference in prices on the pressure systems and little or no ability for consumers to choose between pressure systems, Vector consulted with stakeholders on amalgamating prices across connection types. We received overwhelming support for the removal of pressure system from our pricing structure.

For the pricing year ending 30 September 2014, Vector has simplified the pricing structure by combining the Tertiary and Secondary plans that currently exist (there are no Primary pricing plans), and removing the zonal pricing that exists in Auckland. These alignments allow the COSM allocators to be broken down into 4 different consumer groupings based on flow rate (scm/h) and the type of consumer that uses the connection. Table 3 illustrates the categories. The criteria used to allocate consumers to consumer groups is based on the consumers installed capacity or meter capacity expressed as a maximum flow rate.

Table 3 Consumer groups

Consumer group	Flow rate
Residential/business	<10scm/h
Small commercial	10<40scm/h
Large commercial	40<200scm/h
Industrial	200scm/h +

3.2. Cost of supply model

Vector uses a Cost of Supply Model (COSM) to allocate costs to the consumer groups. This enables Vector to set prices for each consumer group in a cost reflective manner.

3.2.1. Expense categories

Regulatory requirement

2.4.3(4) Where applicable, identify the key components of **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;

The categories of expense allocated by COSM are:

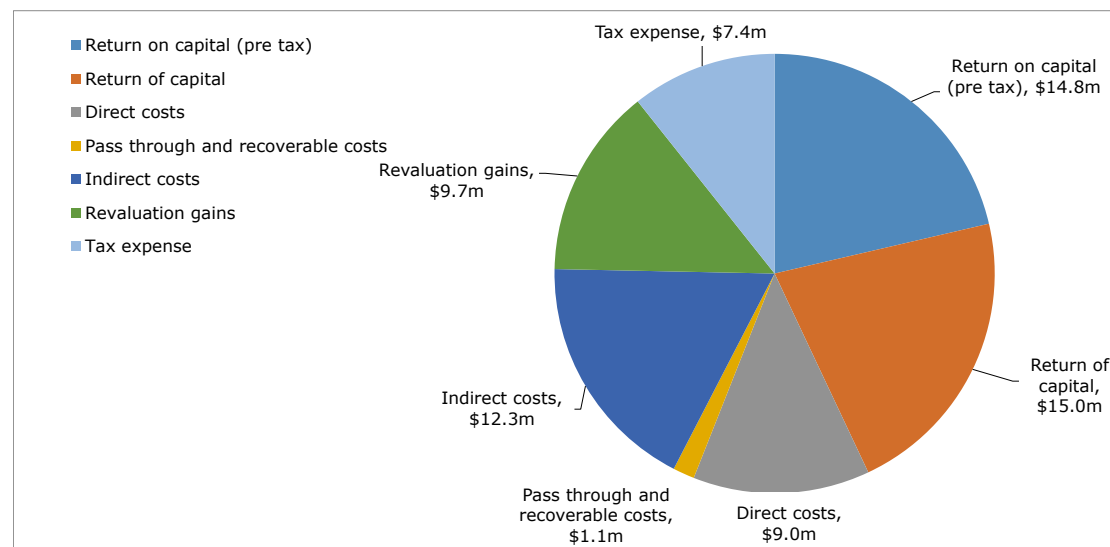
- Depreciation;
- Direct costs;
- Pass-through and recoverable costs;
- Indirect costs;
- Tax expense; and
- Revaluation gains.

The value of the each expense category is shown in Table 4 and represented graphically in Figure 3.

Table 4 Expenses allocated by COSM

Cost category	Amount (\$000)
Return on capital	14,766
Depreciation	14,959
Direct costs	8,981
Pass-through and recoverable costs	1,100
Indirect costs	12,280
Tax expense	7,418
Revaluation gains	9,651

Figure 3 Proportion of costs from each source



3.2.2. Allocators

For the purpose of cost allocations, the Auckland and North Island networks have been combined.

The following allocators are used to allocate costs within the COSM:

- kWh – Amount of gas consumed
- ICP – Number of connected consumers
- scm/h – The connected flow rate of a consumer ("SCM")

These allocators are used individually and in combination (e.g. SCM * ICP) to allocate costs to each consumer group. The value of each allocator is shown in Table 5. The table also includes the proportional allocation to each consumer group for a given allocator.

The amount of gas consumed (kWh) and consumer numbers is based on underlying data from 2012 used in the pricing model for the 2014 pricing year. The connected flow rate of a consumer is derived from the "average" midpoints for scm/h in relation to each consumer group. This was done due to a lack of more detailed information on individual consumer capacity.

Table 5 Cost allocators

Consumer group		Residential/ business	Small - commercial	Large - commercial	Industrial
General allocators					
Connections	ICP	149,180	3,679	1,321	148
SCM	SCM	5	25	120	400
Volume	kWh	1,088,906,960	324,317,464	769,084,538	3,819,756,805
Proportional allocations by allocator					
ICP	%	96.7%	2.4%	0.9%	0.1%
SCM*ICP		70.6%	8.7%	15.0%	5.6%
kWh	%	18.1%	5.4%	12.8%	63.6%
Revenue	%	56.7%	10.5%	15.9%	16.9%
kWh & ICP	%	41.7%	4.5%	9.2%	44.6%

3.2.3. Basis of cost allocation

Pass-through and recoverable costs, indirect costs, and other expenses have been allocated based on a weighted average of the proportion of kWh consumed for each of the consumer groups and the proportion of ICPs in those consumer groups. The proportion of kWh counts for 70% of the weighted average and the proportion of ICPs counts for 30% of the weighted average. The use of a weighted average was adopted to reflect the subjective nature of any allocation of these costs.

For the allocations relating to direct costs, depreciation, and revaluations, an allocator of scm/h*ICP has been used. This allocates based on the weighted average of scm/h per consumer that are in each consumer group, effectively capturing each consumer group's utilisation of network assets. This allocation is more a "pay for use" approach and is a more appropriate allocator for assets and direct networks costs because the required pressure of a consumer will affect the network asset more than if a consumer was to increase usage by 10% but still within its capacity constraints.

Table 6 Cost categories and allocators

Cost category	Amount (\$000)	Allocator
Return on capital	14,766	
Depreciation	14,959	SCM*ICP
Direct costs	8,981	SCM*ICP
Pass-through and recoverable costs	1,100	kWh & ICP
Indirect costs	12,280	kWh & ICP
Other costs	-	kWh & ICP
Tax expense	7,418	SCM*ICP
Revaluation gains	9,651	SCM*ICP
Revenue	69,155	kWh & ICP

3.2.4. Comparison against least cost alternative

As described in section 2.2, average prices per consumer group are compared against the least cost alternative to ensure that prices are not set at a level that would provide an incentive for consumers to disconnect from the gas distribution network. All gas distribution prices are less than the cost of the least cost alternative, so no adjustments need to be made to prices.

3.2.5. Result of allocation methods

Using the method of allocation discussed above, the following allocations in Table 7 are arrived at.

Table 7 Proportion of costs and revenues allocated to each consumer group

Consumer group	2013 prices	2014 COSM	2014 prices
Residential/business	56.6%	61.9%	61.6%
Small commercial	10.1%	7.5%	7.6%
Large commercial	15.8%	13.2%	13.3%
Industrial	17.5%	17.3%	17.6%
Total	100.00%	100.00%	100.00%

3.3. Allocation of target revenue**3.3.1. Target revenue****Regulatory requirement**

2.4.3(3) State the **target revenue** expected to be collected for the **pricing year** to which the pricing methodology applies;

Vector sets its prices to recover an amount less than the Allowable Notional Revenue under the GDPP. Compliance with the Allowable Notional Revenue under the GDPP is determined using current year prices multiplied by quantities lagged by two years. Once price are set to comply with the GDPP, Vector then determines how much revenue these prices will deliver based on forecast quantities in the forthcoming pricing year (target revenue). Due to the difference in quantities between the GDPP and target revenue the amount of target revenue differs from the amount of Allowable Notional Revenue under the GDPP. The target revenue recovered via COSM is \$69,155,133.

3.3.2. Revenue by consumer group

Regulatory requirement

2.4.3(7) Where applicable, describe the method used by the **GDB** to allocate the **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;

The target revenue for gas distribution services is not directly allocated to consumer groups. Instead, it is allocated using the proportional allocations of cost from COSM described above in Section 3.2.5. The outcome of the pricing methodology is the allocation shown in Table 8.

Table 8 Target revenue by consumer group

Consumer group	Lines revenue excl. pass-through	Gross revenue incl. pass-through
Residential/business	\$ 41,053,484	\$ 42,568,645
Small commercial	\$ 5,072,665	\$ 5,259,882
Large commercial	\$ 8,859,627	\$ 9,186,610
Industrial	\$ 11,707,894	\$ 12,139,997
Total	\$ 66,693,671	\$ 69,155,133

3.3.3. Revenue by price component

Regulatory requirement

2.4.3(8) State the proportion of **target revenue** (if applicable) that is collected through each **price component** as **publicly disclosed** under clause 2.4.18.

The Gas Distribution Information Disclosure Determination 2012 defines "Price Component" as the various prices, fees and charges that constitute the components of the total price paid, or payable, by a consumer. The Price Components for Vector's gas distribution pricing are:

- a fixed daily charge; and
- a variable charge based on kWh.

The proportion of revenue recovered by each price component is shown in Table 9.

Table 9 Proportion of target revenue by price component

Region	Price plan	Fixed component	Variable component	Total revenue
North Island price plans	GN0R	9.7%	13.1%	22.9%
	GN01	0.6%	1.1%	1.6%
	GN02	0.6%	1.9%	2.6%
	GN03	1.1%	3.4%	4.5%
	GN04	0.5%	2.9%	3.4%
Auckland price plans	GA0R	14.0%	21.2%	35.2%
	GA01	0.6%	1.3%	1.9%
	GA02	1.2%	3.9%	5.0%
	GA03	1.8%	6.8%	8.6%
	GA04	1.0%	5.4%	6.4%
	Non standard	6.8%	1.2%	8.0%
	Total	37.8%	62.2%	100.0%

3.4. Price changes

Regulatory requirement

2.4.3(6) If **prices** have changed from **prices** disclosed for the immediately preceding **pricing year**, explain the reasons for changes, and quantify the difference in respect of each of those reasons;

*

Gas distribution prices have changed due from the preceding year due to:

The reduction in target revenue as a result of the GDPP; the removal of zonal pricing and the removal of connection type from the pricing structure. Vector has also aligned prices across the North Island and Auckland distribution systems.

Table 10 Price changes by price plan

	Consumer group	Target revenue		Starting price adjustment	Pass through costs	Pricing adjustment	Total
		Qi2011,Pi2013	Qi2011,Pi2013				
North Island price plans	Residential/business	20,480,833	16,727,656	-26.2%	2.1%	5.8%	-18%
	Small commercial	3,156,299	1,652,056	-26.2%	2.1%	-23.6%	-48%
	Large commercial	6,152,526	3,099,206	-26.2%	2.1%	-25.5%	-50%
	Industrial	4,291,144	2,298,395	-26.2%	2.1%	-22.3%	-46%
	Non-standard	1,253,222	1,476,815	-26.2%	2.1%	41.9%	18%
Auckland price plans	Residential/business	29,343,154	24,208,264	-26.2%	2.1%	6.6%	-17%
	Small commercial	5,772,940	3,356,636	-26.2%	2.1%	-17.8%	-42%
	Large commercial	7,605,486	5,719,331	-26.2%	2.1%	-0.7%	-25%
	Industrial	6,137,223	4,153,376	-26.2%	2.1%	-8.2%	-32%
	Non-standard	3,860,083	3,928,200	-26.2%	2.1%	25.9%	2%
Total		88,053,273	66,619,935	-26.2%	2.1%	-0.2%	-24%

Section 4 Consistency with pricing principles

Regulatory requirement

*2.4.3(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**;*

4.1. Pricing principles

The pricing principles are specified in clause 2.5.2 of the Gas Distribution Services Input Methodologies Determination 2010 (Commerce Commission Decision 711, 22 December 2010). Those pricing principles are:

- 1) Prices are to signal the economic costs of service provision, by-
 - a) being subsidy free, that is, equal to or greater than incremental costs and less than or equal to standalone costs, except where subsidies arise from compliance with legislation and/or other regulation;
 - b) having regard, to the extent practicable, to the level of available service capacity; and
 - c) signalling, to the extent practicable, the effect of additional usage on future investment costs.
- 2) Where prices based on 'efficient' incremental costs would under-recover allowed revenues, the shortfall is 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 are responsive to the requirements and circumstances of consumers 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 have regard to the effect on consumers

4.2. Principle #1: Economic costs of service provision

4.2.1. Subsidy-free pricing

Prices are said to be "subsidy-free" when they are not less than incremental cost (IC) and are not greater than stand-alone cost (SAC). Incremental costs for a consumer (or group of consumers) are those costs that are only incurred because of that consumer's (or group of consumers') connection to and use of the gas distribution network. Stand-Alone Cost is the cost of a gas distribution network providing service to just that consumer (or group of consumers).

The revenue allowed under the GDPP includes an allowance for certain costs (such as administration costs) that is based on an allocation of common and shared costs across Vector's regulated businesses rather than an estimate of the magnitude of those costs on a stand-alone basis. This means that the SAC for the provision of gas distribution services is higher than the revenue allowed under the DPP. This also means that, in aggregate, prices set to recover the target revenue are, by definition, less than the SAC for the provision of gas distribution services.

SAC of an alternative network

At a theoretical level, demonstrating that prices are subsidy-free requires that the regulated supplier demonstrates that, for every consumer and every consumer group, the price is not less than the incremental cost of supplying that consumer or consumer group and is not greater than the SAC of supplying that consumer or consumer group. This is generally not practicable to apply across a distribution network with significant numbers of consumers. In particular, the SAC analysis is a highly theoretical exercise involving the construction of hypothetical networks to provide service to each consumer or consumer group – this is a highly labour-intensive exercise that yields an average SAC higher than the SAC for the network as a whole.⁴ Given that prices in aggregate recover less than the SAC for gas distribution services, it is likely that prices are also less than SAC for any given consumer or group of consumers. Where this is not the case the consumer will have the incentive to bypass the gas distribution network – this is addressed under Pricing Principle 3 below.

Incremental cost test

Given the practical difficulty of demonstrating compliance with the SAC test, the normal approach to demonstrating compliance with the "subsidy-free" principle relies on demonstrating compliance with the IC test. By definition, if every consumer and every group of consumers is paying a price that recovers at least IC, then cross-subsidy is likely not occurring.

The estimation of IC is challenging given the highly meshed nature of the gas distribution network. The true IC for a consumer group cannot be easily observed, but must be estimated. This estimate of IC is obtained by:

- Estimate the replacement cost of the combined gas distribution network;
- Allocate a percentage of the replacement cost based on the total revenue for the consumer group (as calculated by COSM);
- Calculate the depreciation and return on capital based on the allocated replacement cost;
- Assign an annual maintenance charge;

⁴ Because of the economies of scale inherent in gas distribution networks, the average per-consumer SAC for a consumer will generally be greater than the average per-consumer SAC for a group of consumers, which in turn will generally be greater than the average per-consumer SAC for the network as a whole. If prices are less than the SAC for the network as a whole then they are likely to be less than SAC for any given consumer or group of consumers. The exception to this is where a large consumer is located close to the gas transmission line and it would be viable to bypass the existing gas distribution system. This is addressed separately under Pricing Principle 3.

Add the depreciation, return on capital, and maintenance charge, and divide the sum by the energy consumed by each consumer group (refer page 13). From this calculation derive the estimated IC expressed in \$/GJ.

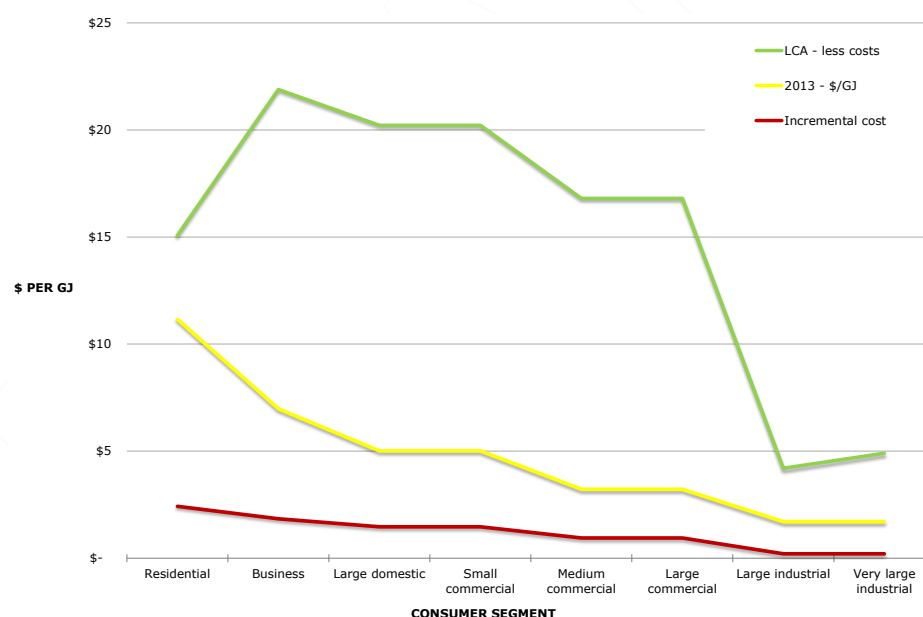
This estimate may be higher than IC to the extent that the use of replacement costs overstates the regulated asset value of Vector's gas distribution assets. This increases the confidence that prices greater than the estimated IC are also greater than the true IC and are therefore subsidy-free. Note also that this is an estimate of the IC for each consumer group as a whole, and not just for an individual consumer within that group. The IC for a group of consumers will be higher than the IC for an individual consumer within that group because the IC for the group will include shared assets used by all members of the group. This further increases the confidence that prices greater than the estimated IC are subsidy-free.

Vector's application of the test

As described in section 2.2, as part of the price-setting process Vector compares proposed prices against the least-cost alternative. In all cases the least-cost alternative for the consumer group was less than the cost of an alternative network.

The chart in Figure 4 below demonstrates that for all consumer groups gas distribution prices are less than the cost of the least-cost alternative (thus meet the SAC test) and are greater than incremental cost (i.e. meet the IC test). This means that Vector's gas distribution pricing is subsidy-free.

Figure 4 Demonstration that prices are subsidy-free



4.2.2. Available service capacity and future investment costs

There are no constraints on available service capacity in the gas distribution network that impact on the economic cost of service provision. Indeed, given the level of available service capacity, it is appropriate that pricing is set in a manner that encourages greater utilisation of the gas distribution network.

There are no significant future investment costs that impact on the economic cost of service provision.

4.3. Principle #2: Recovery of any shortfall

Pricing Principle 2 requires that:

Where prices based on 'efficient' incremental costs would under-recover allowed revenues, the shortfall is made up by prices being set in a manner that has regard to consumers' demand responsiveness, to the extent practicable.

Vector has to work with the metering technology available to measure consumers' use. The majority of consumers' meters are simple and record consumers' total use over monthly or two-monthly meter-reading cycles. These meters do not record the time of use or maximum demand. Having consumer consumption information limited to monthly intervals (at best) limits Vector's pricing structures to simple fixed and variable components, and means that it is not practicable to incorporate demand-responsiveness into prices other than in the general sense implied by considering the choice of alternative fuels.

The data limitations have additional flow on effects, for example reducing the available allocators required for cost allocation purposes.

4.4. Principle #3: Responsive to requirements of consumers

4.4.1. **Prices discourage uneconomic bypass**

Discouraging uneconomic bypass is an extremely important commercial objective for Vector. Gas distribution services have to compete vigorously with alternative fuel and energy sources such as electricity, LPG, wood fires, coal, and solar heating.

Vector historically sought to avoid uneconomic bypass through the use of pricing zones based on distance from the transmission system gate stations. Competing networks need to connect to a transmission system gate station to supply downstream consumers so Vector previously priced consumers closer to the transmission network at a lower price to discourage bypass. Vector has since reconsidered the threat of such uneconomic network bypass and, on balance, decided to move away from the pricing zones, noting that there have been significant overall price reductions since zones were introduced.

Vector has now consideration of alternative fuels that may be economically viable for each capacity group. Prices are tested to ensure that, in general, they are both greater than incremental cost and not so high as to provide the incentive for a consumer to switch to an alternative fuel.

The removal of pricing zones significantly simplified Vector's gas distribution pricing, but may have increased the risk of a large consumer near the transmission network bypassing by way of an alternative network. On the other hand, the explicit consideration of competing energy sources reduces the likelihood that uneconomic bypass will occur from those reasons. A standard price schedule will never be able to eliminate all opportunities for uneconomic bypass, and Vector considers that it is more appropriate to deal with these issues through non-standard contracts as each situation can be dealt with on a case-by-case basis where all consumer specific factors can be taken into account.

4.4.2. **Negotiation for non-standard prices**

Vector considers that the best way to allow consumers to negotiate differing levels of economic value from a service or to mitigate against uneconomic bypass is through non-standard contracts. Large consumers are able to negotiate with Vector for different terms and conditions as long as it is commercially viable and possible for Vector to provide the service.

Typical examples of consumers negotiating to realise economic value of different specific service include reinforcement of the network to allow for greater capacity and the installation and management of specialist equipment and connections. Contracts have been negotiated on non-standard pricing structures to allow consumers to manage their risk, including adjustment in prices to allow for atypical demand loads (e.g. seasonal use patterns) or a preference for pricing that is largely, if not wholly, fixed. Vector is also willing to offer different terms for different length contracts.

Please refer to Section 5 for Vector's policy regarding pricing for non-standard contracts.

4.5. Principle #4: Pricing process

Regulatory requirement

Development of prices is transparent, promotes price stability and certainty for consumers, and changes to prices have regard to the effect on consumers

4.5.1. Development of prices is transparent

Vector considers that the move to a simpler pricing structure enhances transparency. Costs are clearly identified and allocated on a simple and transparent basis.

4.5.2. Price stability and certainty

The simpler pricing structure reduces the likelihood that changes in consumer behaviour will result in significant changes to cost allocations between consumer groups. This means that prices by capacity band will be more stable over time. A simple pricing structure also makes it easier for consumers to predict their likely charges.

4.5.3. Effect on consumers

Vector is particularly conscious of the effect of its pricing on consumers and seeks to implement a pricing structure that provides appropriate incentives for consumers to connect to the gas distribution network and continue to use natural gas.

In July 2013 Vector consulted with gas retailers as representatives of natural gas consumers. The two issues raised by retailers were:

- A concern that a higher proportion of fixed daily charges would reduce the competitiveness of natural gas against other fuels for small consumers; and
- A concern to ensure that the revenue reductions inherent in the starting price adjustment of the GDPP were reflected in standard prices and were not just passed on to consumers on non-standard contracts.

In response to the first concern, Vector decided to reduce the magnitude of the increase in fixed daily charges for residential consumers. This change only affects the ratio between fixed and variable charges for residential consumers; the target revenue from these consumers remains the same.

In response to the second concern, Vector reiterates that revenue is allocated using the methodology described in Section 3. The revenue that Vector seeks to recover from a consumer group is based on the proportion of costs that are allocated to that consumer group. The starting price adjustment, being a component of allowed revenue, is therefore allocated proportionally across all consumer groups.

Section 5 Pricing for non-standard contracts

This section describes Vector's approach to setting prices for non-standard contracts.

5.1. Extent of non-standard contracts

*2.4.5(1) 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** expected to be collected from **consumers** subject to **non-standard contracts**;*

There are 72 consumers subject to non-standard contracts with an expected target revenue of \$5,548,782.

5.2. Criteria for non-standard contracts

*2.4.5(1)(b) Describe the approach to setting **prices** for **non-standard contracts**, including-*

*how the **GDB** determines whether to use a **non-standard contract**, including any criteria used;*

Consumers applying for non-standard pricing or contracts must generally meet a defined set of criteria. Whilst the non-standard criteria are designed to cover most situations, they remain guidelines only and the ultimate decision, with respect to pricing, will be made by Vector. The current non-standard criteria are:

- The Annual Quantity (AQ) is greater than 20 TJ per annum (5.6GWh). In general, non-standard prices would not be offered below this AQ unless there are exceptional circumstances;
- The AQ is in the range 10 to 20 TJ (2.8 to 5.6GWh) and the connection is within 2 km of a gas transmission delivery point or a competing gas distribution network;
- Inter-fuel substitution is practicable or likely; or
- The consumer's consumption profile is unusual.

During the term of the Authorisation Vector transitioned consumers on non-standard contracts to a one-year term because of a high level of uncertainty about what the conditions of the GDPP might be. Now that the GDPP is in place, Vector is continuing to offer one-year contract terms, but may negotiate longer terms on a case-by-case basis.

5.3. Methodology for non-standard prices

*2.4.5(1) Describe the approach to setting **prices** for **non-standard contracts**, including-*

*(c) any specific criteria or methodology used for determining **prices** for **consumers** subject to **non-standard contracts**, and the extent to which these criteria or that methodology are consistent with the **pricing principles**;*

Prices for non-standard contracts are negotiated on a case-by-case basis. However, in all cases prices are tested to ensure that they are not less than incremental cost, given the characteristics of the consumer.

The flexible approach to pricing for non-standard contracts ensures that compliance with the pricing principles is enhanced, as demonstrated in Table 1 below.

Table 1: Compliance of non-standard pricing with the pricing principles

Pricing principle	Extent of compliance without non-standard pricing	Extent of compliance with non-standard pricing
<p>1) Prices are to signal the economic costs of service provision, by-</p> <p>a) being subsidy free, that is, equal to or greater than incremental costs and less than or equal to standalone costs, except where subsidies arise from compliance with legislation and/or other regulation;</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 effect of additional usage on future investment costs.</p>	<p>Prices are subsidy-free</p> <p>There are no capacity constraints to reflect in current pricing. Price structure is set to generally encourage use of spare capacity. However, some spare capacity may be unused in the absence of non-standard pricing if the consumer disconnects from the gas distribution system.</p>	<p>Prices remain are subsidy-free</p> <p>Compliance <i>enhanced</i> because non-standard pricing ensures that consumers that would otherwise disconnect from the gas distribution system will remain connected, use available capacity that would otherwise be unutilised. These consumers will continue to pay some portion of the shared costs of the gas distribution system at least equal to or greater than incremental costs, providing a benefit to all connected parties.</p>
<p>2) Where prices based on 'efficient' incremental costs would under-recover allowed revenues, the shortfall is made up by prices being set in a manner that has regard to consumers' demand responsiveness, to the extent practicable.</p>	<p>If a consumer disconnects because standard prices exceeded their "reservation cost" then those prices did not reflect the demand-responsiveness of that consumer.</p>	<p>Compliance is <i>enhanced</i> because the demand-responsiveness of a price-sensitive consumer has been taken into account by the non-standard pricing.</p>
<p>3) Provided that prices satisfy (1) above, prices are responsive to the requirements and circumstances of consumers 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>All prices are subsidy-free so meet (1) above.</p> <p>Prices have been explicitly set to account for the cost of alternative sources of energy for the average consumer in a consumer group, but do not account for the specific circumstances of all consumers.</p>	<p>Prices continue to be subsidy-free so meet (1) above.</p> <p>Compliance is <i>enhanced</i> because non-standard pricing allows differential prices to be set for the specific consumers where bypass is viable or would otherwise be uneconomic.</p> <p>Compliance is enhanced because non-standard pricing allows prices for gas distribution services to be customised to reflect the economic value of gas distribution services to specific consumers, and allows the consumer to make quality/price trade-offs.</p>

Pricing principle	Extent of compliance without non-standard pricing	Extent of compliance with non-standard pricing
4) Development of prices is transparent, promotes price stability and certainty for consumers, and changes to prices have regard to the effect on consumers		Compliance is <i>enhanced</i> because allowance can be made for the effect on particular consumers whose circumstances make them more sensitive to prices.

5.4. Obligations in respect of service interruptions

(2) Describe the **GDB's** obligations and responsibilities (if any) to **consumers** subject to **non-standard contracts** in the event that the supply of **gas pipeline services** to the **consumer** is interrupted. This description must explain-

(a) the extent of the differences in the relevant terms between **standard contracts** and **non-standard contracts**;

(b) any implications of this approach for determining **prices** for **consumers** subject to **non-standard contracts**.

Vector's obligations to consumers on non-standard contracts are the same as Vector's obligations to consumers on standard contracts in the event that the supply of gas pipeline services to the consumer is interrupted.

The implications of Vector's obligations and responsibilities to customers on non-standard contracts in the event of an interruption of supply has no impact on determining prices for those consumers on non-standard contracts.

Section 6 Compliance matrix

The table below is included to demonstrate how this disclosure complies with the Gas Distribution Information Disclosure 2012.

2.4.1 Every GDB must publicly disclose , before the start of each pricing year , a pricing methodology which-	See individual clauses below.
(1) Describes the methodology, in accordance with clause 2.4.3 of this section, used to calculate the prices payable or to be payable;	Section 3
(2) Describes any changes in prices and target revenues ;	
(3) Explains, in accordance with clause 2.4.5 of this section, the approach taken with respect to pricing in non-standard contracts ;	Section 5
(4) Explains 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 consumers , the reasons for not doing so must be disclosed.	Section 4.5.3
2.4.2 Any change in the pricing methodology or adoption of a different pricing methodology, must be publicly disclosed at least 20 working days before prices determined in accordance with the change or the different pricing methodology take effect.	N/A
2.4.3 Every disclosure under clause 2.4.1 above must-	See individual clauses below.
2.4.3(1) Include sufficient information and commentary to enable interested persons to understand how prices were set for each consumer group , including the assumptions and statistics used to determine prices for each consumer group ;	Section 3
2.4.3(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 ;	Section 4

2.4.3(3) State the target revenue expected to be collected for the pricing year to which the pricing methodology applies;	Section 3.3.1
2.4.3(4) Where applicable, identify the key components of 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;	Strictly speaking, target revenue is independent of the costs and return on investment of Vector's gas distribution services business, and is instead derived from the GDPP. However, section 3.2.1 does provide expenses by category.
2.4.3(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 ;	Section 3.1.
2.4.3(6) If prices have changed from prices disclosed for the immediately preceding pricing year , explain the reasons for changes, and quantify the difference in respect of each of those reasons;	
Revenue by Consumer Group 2.4.3(7) Where applicable, describe the method used by the GDB to allocate the 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;	Section 3.3.2
Revenue by Price Component 2.4.3(8) State the proportion of target revenue (if applicable) that is collected through each price component as publicly disclosed under clause 2.4.18.	Section 3.3.3
Effect of Pricing Strategy 2.4.4 Every disclosure under clause 2.4.1 above must, if the GDB has a pricing strategy - (1) Explain the pricing strategy for the next 5 pricing years (or as close to 5 years as the pricing strategy allows), including the current pricing year for which prices are set;	Vector's Board of Directors have not recorded in writing any decision on plans or strategies to amend or develop prices beyond the pricing year ending on 30 September 2014 and accordingly have not approved a pricing strategy.

<p>(2) Explain how and why prices are expected to change as a result of the pricing strategy;</p> <p>(3) If the pricing strategy has changed from the preceding pricing year, identify the changes and explain the reasons for the changes.</p>	
<p>Prices for Non-Standard Contracts</p> <p>2.4.5 Every disclosure under clause 2.4.1 above must-</p> <p>(1) Describe the approach to setting prices for non-standard contracts, including-</p> <p>(a) the extent of non-standard contract use, including the number of ICPs represented by non-standard contracts and the value of target revenue expected to be collected from consumers subject to non-standard contracts;</p> <p>(b) how the GDB determines whether to use a non-standard contract, including any criteria used;</p> <p>(c) any specific criteria or methodology used for determining prices for consumers subject to non-standard contracts, and the extent to which these criteria or that methodology are consistent with the pricing principles;</p> <p>(2) Describe the GDB's obligations and responsibilities (if any) to consumers subject to non-standard contracts in the event that the supply of gas pipeline services to the consumer is interrupted. This description must explain-</p> <p>(a) the extent of the differences in the relevant terms between standard contracts and non-standard contracts;</p> <p>(b) any implications of this approach for determining prices for consumers subject to non-standard contracts.</p>	<p>Section 5</p> <p>Section 5.1</p> <p>Section 5.2</p> <p>Section 5.3</p> <p>Section 5.4</p>
<p>2.4.6 – 2.4.8 Disclosure of capital contributions</p>	<p>This is disclosed in the separate document “Policy for determining capital contributions on Vector’s gas distribution network”</p>
<p>2.4.9 – 2.4.17 Disclosure of prescribed terms and conditions of contracts</p>	<p>This is disclosed in the separate disclosure available at http://vector.co.nz/corporate/disclosures/gas/gas-prescribed-terms-and-conditions-contracts</p>



**Schedule 18: Certification for Disclosures at the
Beginning of a Pricing Year**

Clause 2.9.2

We, Bob Thompson and Peter Bird, being directors of Vector Limited certify that, having made all reasonable enquiry, to the best of our knowledge:

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

Bob Thompson
Director



Peter Bird
Director

12-9-13
Date


Note: These certificates were signed in counterparts
by the directors

**Schedule 18: Certification for Disclosures at the
Beginning of a Pricing Year**

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We, Bob Thompson and Peter Bird, being directors of Vector Limited certify that, having made all reasonable enquiry, to the best of our knowledge:

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- (b) the prospective financial or non-financial information included in the attached information has been forecast on a basis consistent with regulatory requirements or recognised industry standards.



Bob Thompson
Director

Peter Bird
Director

12-9-13

Date

Note: These certificates were signed in counter part
by the directors