Pricing methodology - Electricity distribution network

From 1 April 2016

Pursuant to:
The Electricity Distribution
Information Disclosure Determination 2012 (consolidated in 2015)

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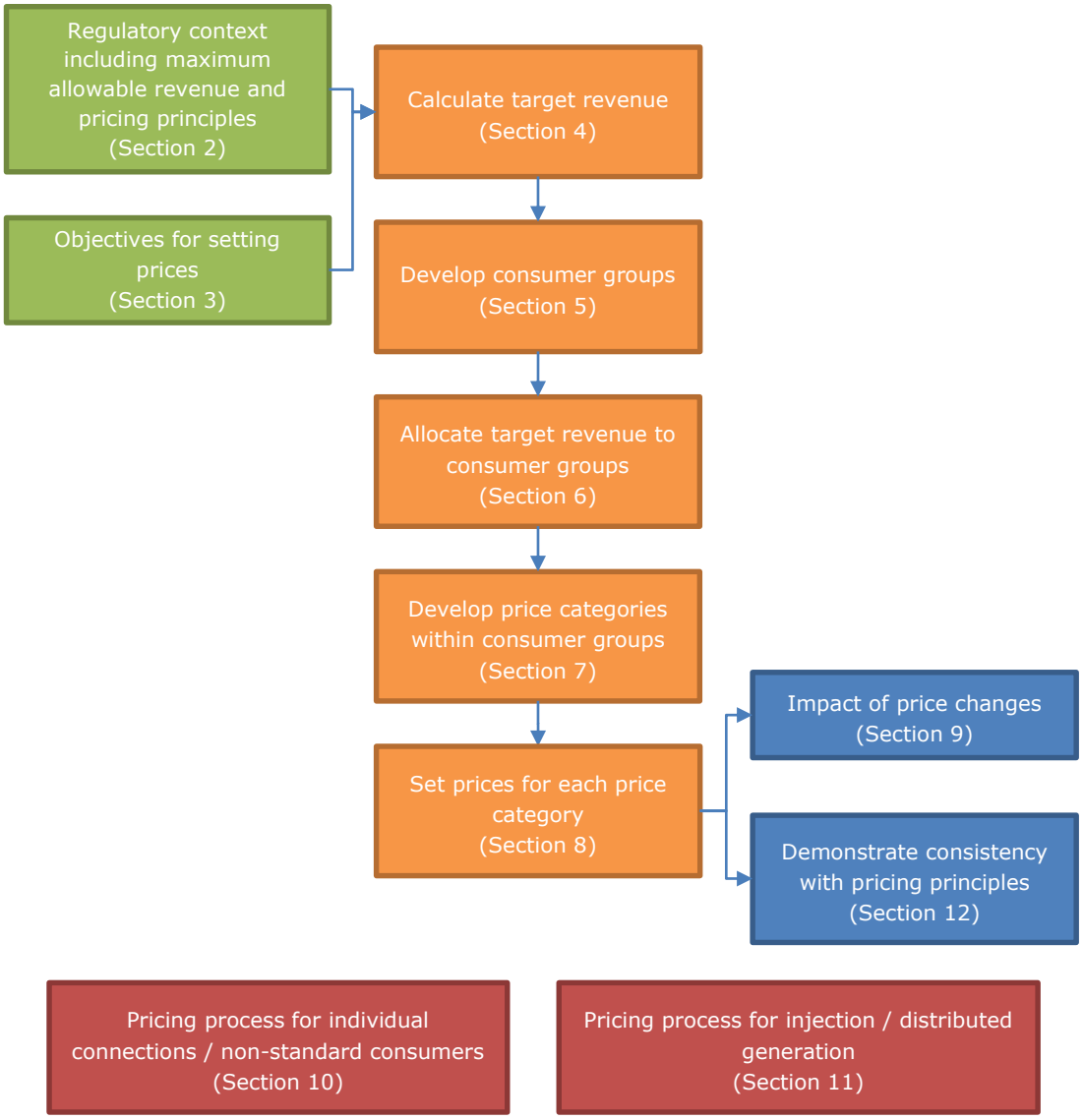
1 INTRODUCTION

Vector owns and operates the electricity distribution network in the greater Auckland region and delivers electricity to more than 540,000 homes and businesses. We recover the cost of owning and operating the network through a combination of standard (published) and non-standard prices for electricity lines services, and capital contributions for new connections.

Vector is regulated by the Commerce Commission (Commission) and is required to publish its pricing methodology for electricity lines services (Pricing Methodology). This document describes Vector's methodology and meets the requirements of the Electricity Distribution Information Disclosure Determination 2012 (consolidated in 2015) (Disclosure Determination). It provides information to assist interested parties in understanding how our electricity lines prices are set.

Figure 1. Process used to allocate costs and set prices



2 REGULATORY CONTEXT

This sections sets out the regulatory context within which Vector provides electricity lines services. It provides an overview of three main areas:

- Commerce Act regulation
- Low User regulation
- Electricity Authority Pricing Principles

2.1 Commerce Act regulation

Under the Commerce Act 1986 (the Act) the Commission regulates markets where competition is limited. This includes electricity distribution services. Regulation for electricity distribution services includes regulation of price and quality through a price-quality path to ensure incentives and pressures, similar to those of a competitive market, are faced by distributors so that consumers will benefit in the long term. This type of regulation is intended to ensure businesses have incentives to innovate and invest in their infrastructure, and to deliver services efficiently and reliably at a quality that consumers expect, while limiting businesses' ability to earn excessive profits.

Price-Quality Path Determination

Vector's lines prices are subject to the Electricity Distribution Services Default Price-Quality Path Determination 2015 (Price-Quality Path Determination). The Price-Quality Path Determination regulates two components of Vector's prices: the distribution price component and the pass-through price component. The pass-through price component recovers costs that are largely outside of Vector's control, known as pass-through and recoverable costs. These include transmission charges, council rates and levies. The distribution price component recovers the remaining costs of owning and operating the distribution network.

The Price-Quality Path Determination sets Vector's maximum allowable revenue from distribution prices for the year beginning 1 April 2015 and allows distribution prices to increase by CPI in the following four years of the regulatory period. Compliance with the distribution price path is assessed on a notional basis, using prices multiplied by quantities from two years prior.

Pass-through prices recover the actual pass-through and recoverable costs that Vector incurs. A mechanism at the end of each pricing year allows for any differences between pass-through and recoverable costs and pass-through price revenues to be washed-up in subsequent years with a time value of money adjustment.

Disclosure Determination

Under Part 4 of the Act, businesses supplying distribution services are also subject to information disclosure regulation which requires information about their performance to be published. The purpose of this regulation is to ensure that sufficient information is readily available to interested persons to assess whether the purpose of Part 4 of the Act is being met. As a result, Vector must make disclosures under the Disclosure Determination. This document contains the information that must be disclosed in accordance with clauses 2.4.1 to 2.4.5 of the Disclosure Determination.

2.2 Low User Regulations

Vector's residential prices are also subject to the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 (the Low User Regulations). These regulations require distributors to offer residential consumers a price option at their primary place of residence with a fixed price of no more than $0.15 per day (excluding GST) and where the sum of the annual fixed and volume charges on that price option is no greater than any other residential price option for consumers using up to 8,000 kWh per annum.

2.3 Pricing Principles

Vector has developed its prices with reference to the Electricity Authority's Pricing Principles (Pricing Principles). The purpose of the Pricing Principles is to ensure prices are based on a well-defined, clearly explained and economically rational methodology. While the Pricing Principles are voluntary, the Disclosure Determination requires each EDB to either demonstrate consistency with the Pricing Principles or explain the reasons for any inconsistencies. The Electricity Authority reviews distributors' pricing approaches to monitor the extent to which they are consistent with the Pricing Principles. The results of the 2013 review can be found at https://www.ea.govt.nz/operations/distribution/pricing/. In this review, Castalia found that "Vector's pricing methodology is robust and sound."[1]

Section 12 of this document sets out the Pricing Principles and comments on the extent to which Vector's Pricing Methodology is consistent with them.

[1] *Evaluation of Vector's 2013 Pricing Methodology,* Castalia Strategic Advisers, p2.

3 OBJECTIVE FOR SETTING PRICES

Vector provides electricity lines services to consumers via its electricity distribution network. Vector generally recovers the cost of providing electricity lines services to existing consumers through standard prices or (in a limited number of circumstances) non-standard prices.

Vector does not have a pricing strategy as defined in the Disclosure Determination. However Vector has developed a high-level framework to guide the development of its Pricing Methodology. The overarching objectives for the Pricing Methodology include:

Objective	Rationale
Cost recovery	Ensure Vector recovers its costs, including the allowed return on and of investment. A key aspect of cost recovery is the predominantly sunk and fixed nature of the costs.
Meet regulatory obligations	Comply with the Price-Quality Path Determination, Low User Regulations and the Pricing Principles.
Clear pricing structure	Pricing should be simple and easily understood by consumers therefore making it attractive to stay connected and for new consumers to connect.
Coherent overall price structure	There should not be incentives for consumers to switch consumer groups or price categories to take advantage of anomalies in the pricing structure.
Cost reflective pricing	Ensure that all consumers face prices that reflect the cost of providing them with service; that prices to all new consumers at least cover the incremental costs of connecting them to the network (including costs associated with upstream reinforcement); and that charges to recover overhead costs and the cost of the shared network are allocated between consumers in a manner that is least likely to distort decisions.
Consumer-centric outcomes	Take account of the value of the service to consumers; provide pricing stability; and manage price shock effectively in the transition to new price structures.
Incentivise efficient usage	Encourage/discourage more utilisation of electricity assets to ensure that sunk investments are not inefficiently by-passed and new investments are efficient.

4 CALCULATION OF TOTAL TARGET REVENUE

This section sets out the amount of revenue that Vector is expected to recover through prices (total target revenue) and breaks this down by key cost components.

As pass-through and recoverable costs are recovered separately from distribution revenue under the Price-Quality Path Determination (described in Section 2.1), the distribution component of total target revenue is calculated separately from the pass-through and recoverable component of total target revenue.

Total target revenue is therefore the sum of distribution target revenue and pass-through and recoverable target revenue.

4.1 Calculation of distribution target revenue

To determine target revenue from distribution prices, Vector uses allowable notional revenue calculated in accordance with the Price–Quality Path Determination, adjusted for forecast volume growth. This is the amount of actual revenue that is expected for the 2016/17 pricing year.

The cost components of target revenue used for distribution prices are derived from internal forecasts of costs over the 2016/17 period. Return on capital in the table below is the residual between the sum of the forecast costs for 2016/17 and the distribution target revenue.

Table 1 below shows the target revenue from distribution prices that Vector expects to receive for 2016/17 compared with 2015/16. Target revenue from distribution prices is $395m.

Table 1. Target revenue from distribution prices 2016/17 and 2015/16

Component	Cost type	Target revenue ($m)	
		2016/17	2015/16
Maintenance	Asset	49	48
Direct costs	Asset	12	10
Indirect costs	Non-Asset	16	13
Allocated costs	Non-Asset	36	37
Depreciation - system assets	Asset	92	90
Depreciation - non-system assets	Non-Asset	13	18
Regulatory tax adjustment	Asset	18	23
Regulatory tax allowance	Asset	44	41
Return on capital	Asset	115	106
Distribution revenue		395	386

The second column of Table 1 categorises cost components as either 'Asset' or 'Non-Asset'. These categorisations determine the way that the costs are allocated to consumer groups, and are discussed in Section 6.

4.2 Calculation of pass-through and recoverable target revenue

Target revenue from pass-through prices is equal to the expected value of pass-through and recoverable costs, or $223m. Table 2 summarises the components of target revenue from pass-through prices for 2016/17 compared with 2015/16.

Table 2. Target revenue from pass-through prices 2016/17 and 2015/16

Description	Cost type	Target revenue ($m)	
		2016/17	2015/16
Rates	Non-Asset	9	9
Levies	Non-Asset	3	3
CAPEX wash-up[2]	Non-Asset	(2)	-
Transmission costs	Transmission	213	209
Pass-through and recoverable revenue		223	221

The second column of Table 2 categorises cost components as either "Non-Asset" or "Transmission". These categorisations determine the way that the costs are allocated to consumer groups, and are discussed in Section 6.

4.3 Total target revenue

Total target revenue is the sum of target revenue from distribution prices ($395m) and target revenue from pass-through prices ($223m). Total target revenue for 2016/17 is $618m. This compares with total target revenue for 2015/16 of $607m.

[2] The CAPEX wash-up adjustment is a new recoverable cost from 1 April 2016. It is based on the difference between the Commission's forecast of CAPEX spend in the final year of the previous regulatory period and Vector's actual CAPEX spend in that year. A similar CAPEX wash-up will also apply to the three remaining years of the current regulatory period.

5 DEVELOPMENT OF CONSUMER GROUPS

The following section explains how Vector has developed distinct groups of consumers in order to allocate the components of total target revenue to these groups as part of the price setting process.

Vector has developed consumer groups based on their utilisation of the network and the nature of the network service they receive. Due to the physical nature of distribution networks and the information that is available on consumer demand characteristics, these consumer groups are defined at a relatively high level. Examples of the network characteristics include:

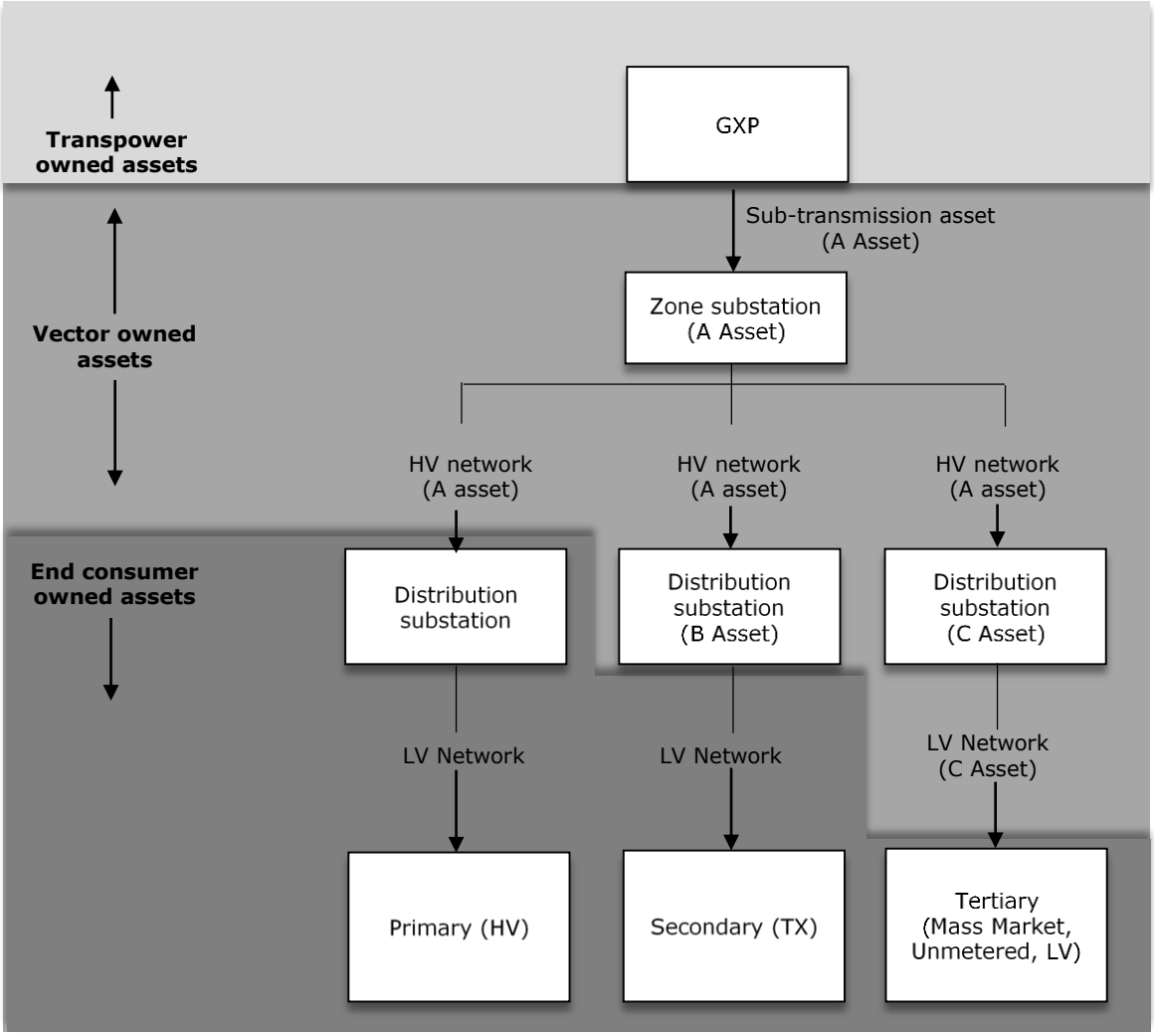
a) There is a high degree of network meshing and interconnection of consumers. This means that multiple end consumers utilise many of the same assets. A large industrial consumer consuming large volumes of electricity per year is likely to be using some of the same network assets as a residential end consumer consuming only small amounts.
b) End consumers are not generally geographically segmented in their use of different network assets. For example, there are in general very few purely "industrial zones" or "residential zones". A residential consumer is likely, in part at least, to use the same assets as an industrial consumer. A map of the location of different types of consumers across a portion of the network is included as Appendix 4 and illustrates this point.
c) There is a mix of consumers, including a large number of consumers with relatively low individual consumption, and a small number of consumers with relatively high individual consumption. For example, end consumers with a capacity less than 69kVA represent 99% of all connections but they only use 54% of the energy transported over the distribution network.

In previous years Vector defined consumers groups based on the nature of their connection to the electricity distribution network. Each of these connection types represented a group of end consumers that received a homogenous but uniquely defined service from Vector. The three connection types were:

- Primary – where the consumer connects directly to Vector's high voltage (HV) network;
- Secondary – where the consumer connects a consumer-owned network to Vector's HV network through Vector-owned transformers; and
- Tertiary – where the consumer connects to Vector's low voltage (LV) network.

These connection types are illustrated diagrammatically in Figure 2.

Figure 2. Electricity network diagram



The Tertiary connection type contains a significant variety of consumers from small residential consumers up to large commercial and industrial consumers connected to Vector's LV network. In the past there was limited benefit in disaggregating this consumer group as Vector had very limited demand and time-of-use consumption information to form the basis of a more detailed cost allocation.

With the higher penetration of smart meter across our network, we have more detailed information on peak usage of individual consumers. This has allowed us to disaggregate the Tertiary connection type into low voltage, unmetered and mass market consumer groups from 1 April 2015.

Table 3 shows the consumer groups Vector now uses and the relationship between the consumer group and connection type. Vector allocates consumers to consumer groups based on their point of connection to the network, their capacity, metering type and end usage. Consumer groups are therefore generally mutually exclusive, i.e. an end consumer can logically only fit within one group.

Table 3. Relationship between connection type and consumer groups

Size	Connection type	Consumer group
Large > 69kVA	Primary	High voltage
	Secondary	Transformer
	Tertiary	Low voltage
Small ≤ 69kVA		Unmetered
		Mass market

a) High voltage (HV) consumers have a Primary connection type and are supplied directly from Vector's high voltage or sub-transmission (6.6kV or higher) network;
b) Transformer (TX) consumers have a Secondary connection type and are supplied from a transformer(s) owned by Vector and which supplies the consumer's low voltage (400V three phase or 230V single and two phase) network;
c) Low voltage (LV) consumers have a Tertiary connection type and are supplied from Vector's low voltage (400V three phase or 230V single and two phase) network with a connection capacity of greater than 69 kVA;
d) Unmetered consumers have a Tertiary connection type and are supplied from Vector's low voltage network and have capacity less than 1 kVA; and
e) Mass market consumers have a Tertiary connection type and are supplied from Vector's low voltage network with a connection capacity less than 69 kVA.

6 ALLOCATION OF TARGET REVENUE TO CONSUMER GROUPS

The following section explains how Vector uses its cost of service model (COSM) to allocate the costs of owning and operating the distribution network to the consumer groups described in the previous section to determine how much total target revenue Vector intends to recover from each consumer group.

6.1 Features of electricity distribution system assets

A key feature of an electricity distribution system is that it is a network of interconnected assets. Many consumers on the network share assets and it is difficult to identify precisely who benefits from which assets. While this means that the allocation of costs between consumers or groups of consumers can be made in many different ways, it also means that the cost of providing the network is shared widely and therefore the cost of network services is generally low for each consumer.

The way the network of assets has been built up over time is something that Vector now has limited ability to change, however Vector is able to influence present and future investment decisions in the electricity distribution network.

6.2 Cost types

Table 1 and Table 2 in Section 4 list the components of total target revenue and categorise these components as either 'Asset', 'Non-Asset' or 'Transmission'. This is summarised in Table 4 below.

Table 4. Total target revenue by cost allocation category

Revenue type	Category	Value ($m)
Distribution	Asset	330
	Non-asset	66
Pass-through	Transmission	213
	Non-asset	10

6.3 Apportioning 'Asset' costs by asset types

Costs categorised as 'Asset' related costs are primarily incurred as a result of electricity distribution network assets. Vector has grouped these assets into three distinct categories as shown in Table 5 below. The table also shows which connection types and consumer groups use each category of assets.

Table 5. Asset categorisation

Category	Assets	Connection types	Consumer groups
A	• Sub-transmission lines / cables • Zone-substations • HV lines / cables	All	All
B	• Distribution substations that have no Vector-owned low voltage lines / cables leaving the substation	Secondary only	Transformer

C	• Distribution substations that:
	  ○ have Vector-owned low voltage lines leaving the substation, or
	  ○ supply multiple end-consumers connected at low voltage
	• Low voltage assets
		Tertiary only	Low voltage, unmetered, mass market

Vector assumes that costs associated with assets are incurred in proportion to the value of the assets. In this way each 'asset' cost listed in Table 1 is split amongst the three asset types. For example, as A assets make up 69% of the value of Vector's Regulatory Asset Base, Vector assumes that 69% of maintenance costs will be associated with A assets.

6.4 Summary of allocation approaches

The allocators for 'Asset', 'Non-Asset' and 'Transmission' costs are applied to the combined Northern and Auckland networks. The allocators used to allocate costs to consumer groups are summarised below:

Table 6. Allocators used in the COSM model

<table>
<tr><th rowspan="2">Connection Type</th><th rowspan="2">Consumer group</th><th colspan="3">Asset costs</th><th rowspan="2">Non-asset costs</th><th rowspan="2">Transmission costs</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Primary</td><td>High voltage (HV)</td><td rowspan="3">Contribution to RCPD</td><td>n/a</td><td rowspan="2">n/a</td><td rowspan="4">Number of consumers or annual consumption</td><td rowspan="4">Contribution to RCPD</td></tr>
<tr><td>Secondary</td><td>Transformer (TX)</td><td>Directly attributed</td></tr>
<tr><td>Tertiary</td><td>Low voltage (LV)
Unmetered
Mass market</td><td rowspan="2">n/a</td><td>Contribution to RCPD or annual consumption</td></tr>
</table>

6.5 Allocation of 'Asset' related costs to consumer groups

Vector aims to allocate asset-related costs on the basis of a consumer group's usage of the assets during peak periods as this usage drives the need for, and the size of, the assets.

For A assets, the most appropriate peak periods to use are GXP peaks and zone substation peaks. Vector has found that a consumer group's contribution to GXP peaks is very similar to that group's contribution to Transpower's Regional Coincident Peak Demand (RCPD) periods. Vector has also found that zone substation peak data can be unreliable, as these peaks often occur as a result of network switching and back feeding, so in practice this doesn't provide a sound basis for cost allocation. As a result Vector uses contribution to RCPD peak to allocate A asset costs.

Vector allocates A asset costs in proportion to a consumer group's demand during RCPD periods.

B asset costs do not require allocation as B assets are only used by the Secondary connection type and therefore the transformer consumer group.

C asset costs are allocated between the low voltage, unmetered and mass market consumer groups. As C assets are low voltage assets located close to the end consumer, the most appropriate allocator for C assets might therefore be a consumer group's Anytime Maximum Demand, or demand coincident with a distribution substation peak. However neither of these values are currently available for mass market consumers so proxies must be used for allocation. The readily-available proxies are demand at RCPD periods and annual consumption. Vector uses both allocators to produce a band of cost allocation values.

6.6 Allocation of 'Non-asset' costs to consumer groups

'Non-asset' costs can be broadly summarised as overhead costs and pass-through and recoverable costs (other than transmission costs). Costs categorised as 'Non-asset' have no direct cost driver. Vector has chosen to create a band of cost allocations using annual consumption and the number of consumers as the allocators.

6.7 Allocation of 'Transmission' costs to consumer groups

Costs categorised as 'Transmission' are transmission charges from Transpower passed through to consumers by Vector. Transmission interconnection costs (which form the majority of transmission charges) are levied by Transpower on the basis of demand during RCPD periods. Vector allocates transmission costs to each consumer group on the basis of demand during these RCPD periods, replicating the methodology used by Transpower to allocate interconnection costs.

6.8 Values for allocators

Table 7 summarises the value of each of the allocators used in the COSM. The values are weighted averages of up to five years' worth of data, with more recent years weighted more heavily.

Table 7. Value of Allocators

Allocator	Number of consumers	Annual consumption	Contribution to RCPD
Units	ICPs	MWh	MW
Source	Schedule 8 of the Information Disclosures	Schedule 8 of the Information Disclosures	Metering data
High voltage	141	516	71
Transformer	1,356	1,450	210
Low voltage	4,452	1,016	150
Unmetered	2,198	55	14
Mass market	531,143	4,487	1,162
Non-standard	48	799	108
Total	539,338	8,323	1,715

6.9 Total target revenue allocated to each consumer group

Vector has created bands of acceptable cost allocations through the choice of annual consumption or contribution to RCPD for allocating C assets and the choice of number of consumers or annual consumption for allocating 'Non-asset' costs. The upper and lower bounds of these ranges are shown in Table 8 below.

Table 8. Total target revenue allocation bands by consumer group ($m)

	Distribution			Pass-through and recoverable			Total		
	Lower		Upper	Lower		Upper	Lower		Upper
HV	10	-	14	9	-	10	19	-	24
TX	35	-	48	26	-	28	61	-	76
LV	31	-	46	19	-	20	50	-	66
Unmetered	3	-	3	2	-	2	5	-	5
Mass market	272	-	304	152	-	156	424	-	460
Non-standard	12	-	12	11	-	11	23	-	23

7 DEVELOPMENT OF PRICE CATEGORIES

The following section provides an overview of the various price categories that Vector offers within each consumer group (as described in Section 5). The key pricing differences between these categories and the reasons why are described in Section 8.

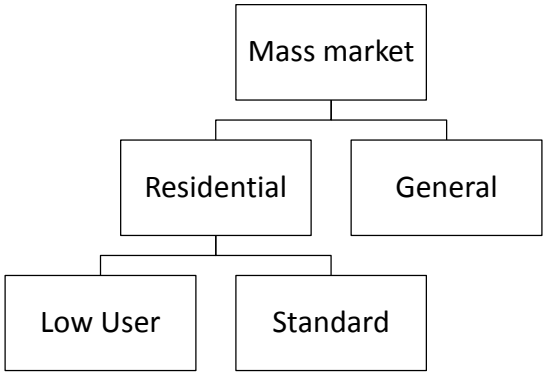
7.1 Auckland and Northern networks

Vector has two distinct sets of price categories, one applicable to consumers on the Auckland network and one applicable to consumers on the Northern network. The approximate areas covered by the Northern and Auckland electricity distribution networks is shown in Appendix 3. Mass market prices have been aligned between the two networks from 1 April 2015.

7.2 Mass market consumer group

The mass market consumer group is split into two subgroups, residential and general (see Figure 3) with the key difference between the subgroups being the application of the Low User Regulations to the residential subgroup only. The subgroups are further split into price categories as set out in Table 9 below.

Figure 3. Mass market price categories



Residential price categories ending in 'L' are the price categories that comply with the Low User Regulations. Prices for 'general' consumers are the same as standard residential consumers.

Table 9. Mass market price categories

Auckland	Northern	Short description	Key eligibility criteria / purpose
ARCL ARCS	WRCL WRCS	Residential controlled	Residential consumers with controllable load
ARUL ARUS	WRUL WRUS	Residential uncontrolled	Residential consumers without controllable load
ARGL ARGS	WRGL WRGS	Residential gas	Residential consumers who also have reticulated gas connections
ARHL ARHS	WRHL WRHS	Residential time of use	Residential time of use pricing option, requires half hourly metering
ABSN	WBSN	General	Non-residential < 69 kVA consumers
ABSH	WBSH	General time of use	Non-residential < 69 kVA time of use pricing option, requires half hourly metering

7.3 Other consumer groups

The remaining consumer groups are split into price categories as set out in Table 10 below. The key differences between price categories relate to metering requirements and connection capacities.

Table 10. Other price categories

Unmetered

Auckland	Northern	Short description	Key eligibility criteria / purpose
ABSU	WBSU	General unmetered	Unmetered < 1 kVA capacity connections, mostly street lighting

Low voltage > 69 kVA

Auckland	Northern	Short description	Key eligibility criteria / purpose
ALVT	WLVH	Low voltage time of use	Main category for low voltage consumers, requires time of use metering
ALVN	WLVN	Low voltage non time of use	Alternative category available to smaller low voltage consumers (< 345 kVA) who may not have time of use metering

Transformer

Auckland	Northern	Short description	Key eligibility criteria / purpose
ATXT	WTXH	Transformer time of use	Main category for transformer consumers, requires time of use metering
ATXN	WTXN	Transformer non time of use	Alternative category available to smaller transformer consumers (< 345 kVA) who may not have time of use metering

High voltage

Auckland	Northern	Short description	Key eligibility criteria / purpose
AHVT	WHVH	High voltage time of use	Main category for high voltage consumers, requires time of use metering
AHVN	WHVN	High voltage non time of use	Alternative category available to smaller high voltage consumers (< 345 kVA) who may not have time of use metering

8 HOW STANDARD PRICES ARE SET FOR EACH PRICE CATEGORY

The following section explains how Vector sets its prices to recover the total target revenue allocated to consumer groups. It explains what types of prices are used and how the levels of prices are determined. It does this separately for distribution prices and pass-through prices.

As described in Section 3, Vector generally tries to recover the components of total target revenue in line with how those costs are incurred, while having regard to (among other things) historical price structures, minimising rate shock to consumers, and minimising recovery risk.

8.1 Overview of price components that Vector uses

Vector has a range of price components that apply to different price categories depending on the characteristics of a particular category and the availability of metering data. In some cases the price components for each category are historical and were inherited by Vector.

Table 11. Description of price components

Price type	Price component	Code(s)	Units	Description
Fixed	Daily	FIXD	$/day	Daily price applied to the number of days each consumer's point of connection is energised.
	Capacity	CAPY	$/kVA/day	Daily price applied to the installed capacity (or nominated capacity for AHVT or WHVH) of each consumer.
Variable	Volume	AICO 24UC OFPK PEAK	$/kWh	Volume price, applies to all electricity distributed to each consumer. Rate may vary depending on price category, e.g. controlled volume (AICO), uncontrolled volume (24UC), off peak volume (OFPK), or peak volume (PEAK).
	Demand	DAMD	$/kVA/day	Daily price applied to the average of the consumer's ten highest kVA demands between 8am and 10pm on weekdays each month.
	Excess Demand	DEXA	$/kVA/day	Daily price applied when the anytime maximum demand is greater than the nominated capacity and is applied to the difference between the anytime maximum kVA demand and the nominated capacity.
	Power factor	PWRF	$/kVAr/day	Daily price determined each month where a consumer's power factor is less than 0.95 lagging. The kVAr amount is calculated as twice the largest difference between the recorded kVArh in any one half-hour period and the kWh demand recorded in the same period divided by three.
	Injection	INJT	$/kWh	Volume injection price applies to all electricity injected into the network by each consumer.

8.2 How the distribution component of prices is derived

Table 12. Proportion of distribution target revenue by price component for the mass market consumer group

Description	Price categories	Fixed prices Daily	Variable prices Volume
Residential, low user	ARCL, ARUL, ARGL, ARHL, WRCL, WRUL, WRGL, WRHL	14%	86%
Residential, standard	ARCS, ARUS, ARGS, ARHS, WRCS, WRUS, WRGS, WRHS	61%	39%
General[3]	ABSN, ABSH, WBSN, WBSH	40%	60%

Vector's mass market price categories predominantly have a two part charge comprising of a daily fixed price and a volume consumption price. This is largely a result of the historic availability of consumption information. As smart meters have become common, a time-of-use category has been introduced with prices that differentiate between peak and off-peak consumption in an attempt to reflect the costs to Vector of consumers' consumption during those time periods.

The majority of Vector's costs are fixed and sunk, so Vector has been seeking to increase the fixed portion of revenues to align the recovery of revenues with the manner in which costs are incurred. Fixed prices in the standard mass market price categories have increased from $0.98 per day to $0.99 per day.

Vector's residential prices are subject to the Low User Regulations, as discussed in section 2.2. Vector complies with these regulations by offering price categories with a fixed price of $0.15 per day.

Volume prices are then set to recover the remainder of the revenue allocated to the mass market consumer group, while minimising rate shock to consumers. Volume distribution prices for low user price categories have increased from $0.0630/kWh to $0.0638/kWh and for standard price categories increased from $0.0252/kWh to $0.0255/kWh. These prices also ensure that consumers who use 8,000 kWh per year or less are better off on the low fixed price options, as required by the Low User Regulations.

General prices remain aligned with residential standard price categories as in practice these consumers have similar sized connections and Vector provides the same services to these consumers as to residential consumers on standard prices.

[3] Prices between standard residential categories and the equivalent general categories are the same, however volume makes up a larger portion of revenue in the general price categories.

Table 13. Proportion of distribution target revenue by price component for the unmetered consumer group

Description	Price categories	Fixed prices	Variable prices
		Daily	Volume
Unmetered	ABSU, WBSU	75%	25%

In line with metered general prices, Vector has a two part charge for unmetered price categories and has increased the daily fixed price from $0.14/day to $0.15/day. In order to recover the COSM allocated revenue the distribution volume price for unmetered consumers has decreased from $0.0372/kWh to $0.0320/kWh.[4]

Table 14. Proportion of distribution target revenue by price component for LV, TX and HV consumer groups

Description	Price categories	Fixed prices		Variable prices		
		Daily	Capacity	Volume	Demand	Power factor
Auckland TOU	ALVT, ATXT, AHVT	-	23%	55%	15%	7%
Northern TOU	WLVH, WTXH, WHVH	17%	30%	33%	13%	8%
Auckland non-TOU	ALVN, ATXN, AHVN	8%	27%	65%	-	1%
Northern non-TOU	WLVN, WTXN, WHVN	24%	21%	52%	-	3%

The rationale for Vector's price structure for its low voltage, transformer and high voltage price categories is largely historical. There were (and to a lesser extent still are) a variety of price categories with different combinations of price components and price levels.

Current TOU price categories on the Auckland network consist of volume, capacity, demand, power factor, and (in the case of AHVT) excess demand prices. On the Northern network TOU plans also include a daily fixed price. Non-TOU plans on both networks include daily fixed, volume, capacity and power factor prices.

Vector maintains a relationship between low voltage, transformer and high voltage price categories where, with the exception of power factor prices, high voltage prices are 97% of transformer prices which are 98% of low voltage prices. This approach reflects the underlying costs and removes the incentive for consumers to move between consumer groups to arbitrage Vector's prices.

Vector continues to align the prices for low voltage, transformer and high voltage consumer groups between the Auckland and Northern networks. In addition, Vector continues to increase the fixed portion of revenues to align the recovery of revenues with the manner in which costs are incurred. For these reasons the capacity price has increased on the Northern network, while all prices have increased slightly on the Auckland network.

Vector includes a power factor price to incentivise end-consumers to maintain a power factor of 0.95 or higher in accordance with Vector's distribution code. Vector has reviewed

[4] As consumers in this consumer group are not metered, they are charged primarily based on volume calculated on the basis of non-daylight hours and fitting wattages.

consumer responses to the current level of power factor prices and are satisfied the existing prices are sufficient to incentivise consumers to correct poor power factor (if any). Accordingly Vector is leaving the power factor price unchanged from 1 April 2016.

8.3 How the pass-through and recoverable component of prices is derived

Vector has determined the pass-through and recoverable component of prices so that the revenue from those prices recovers the pass-through and recoverable costs allocated to each consumer group through the COSM.

The main component of pass-through and recoverable revenue is transmission charges. Transmission charges are allocated to Vector predominantly based on demand during RCPD periods. Vector mirrors this as closely as possible by recovering through demand prices where available, or volume prices otherwise.

Table 15. Proportion of pass-through and recoverable target revenue by price component for the mass market consumer group

Description	Price categories	Fixed prices	Variable prices
		Daily	Volume
Residential, low user	ARCL, ARUL, ARGL, ARHL, WRCL, WRUL, WRGL, WRHL	-	100%
Residential, standard	ARCS, ARUS, ARGS, ARHS, WRCS, WRUS, WRGS, WRHS	-	100%
General	ABSN, ABSH, WBSN, WBSH	-	100%

As mass market price categories do not have a demand price, the pass-through and recoverable revenue is recovered through volume prices as these are the closest proxy for demand prices.

For non-TOU mass market price categories, the pass-through and recoverable revenue required from the COSM for the mass market consumer group is divided by the forecast consumption (kWh) for 2016/17 to obtain a pass-through price. Vector then implements a differential between the controlled and uncontrolled price categories to reflect the benefits arising from consumers allowing Vector to control their hot water load. These prices remain unchanged from 2015/16 at $0.0300/kWh for controlled consumers and $0.0380/kWh for uncontrolled consumers.

For TOU mass market price categories Vector recovers the pass-through and recoverable revenue from consumption in the peak period only. Transmission charges form the bulk of pass-through and recoverable costs and recovering these during peak periods aligns with when these costs are incurred by Vector.

The peak pass-through price of $0.1000/kWh in 2016/17 is a reduction from $0.1253/kWh in 2015/16. This price has been set so that for a residential consumer with a typical usage profile, total charges on the TOU price categories are aligned with total charges on the controlled price categories. Consumers who consume a greater than average portion of their energy during off-peak times i.e. they have a atypical usage profile, or who can adjust their usage patterns in order to do so, will benefit from being on a time of use price category.

Table 16. Proportion of pass-through and recoverable target revenue by price component for the unmetered consumer group

Description	Price categories	Fixed prices	Variable prices
		Daily	Volume
Unmetered	ABSU, WBSU	-	100%

As unmetered price categories do not have a demand price, the pass-through and recoverable revenue is recovered through volume prices.

The calculation used for the unmetered consumer group is the same as the non-TOU mass market consumer group, that is the pass-through and recoverable revenue required from the COSM for the mass market consumer group is divided by the forecast consumption (kWh) for 2016/17 to obtain a pass-through price.

Table 17. Proportion of pass-through and recoverable target revenue by price component for LV, TX and HV consumer groups

Description	Price categories	Fixed prices		Variable prices		
		Daily	Capacity	Volume	Demand	Power factor
Auckland TOU	ALVT, ATXT, AHVT	-	-	-	100%	-
Northern TOU	WLVH, WTXH, WHVH	-	-	-	100%	-
Auckland non-TOU	ALVN, ATXN, AHVN	-	-	100%	-	-
Northern non-TOU	WLVN, WTXN, WHVN	-	-	100%	-	-

As TOU consumers have demand prices, Vector applies a pass-through and recoverable price to the demand component of prices. For TOU low voltage, transformer and high voltage consumers, Vector has derived a pass-through and recoverable price by dividing the total revenue forecast to be recovered from TOU consumers (based on the volume pass-through and recoverable price of $0.0204/kWh and forecast consumption (kWh) for 2016/17) by the forecast demand (kVA) for TOU consumers for the 2016/17 period. This results in a demand price of $0.2480/kVA/day, unchanged from 2015/16.

Non-TOU consumers do not have demand prices so pass-through and recoverable costs are recovered through volume prices. For non-TOU low voltage, transformer and high voltage consumers, Vector has derived a pass-through and recoverable price by summing the total pass-through and recoverable revenue allocated to these consumer groups and then dividing this total by the total forecast consumption (kWh) for 2016/17 for these consumer groups periods to obtain a pass-through and recoverable price of $0.0204/kWh, unchanged from 2015/16.

8.4 Consultation prior to setting prices

Vector did not directly seek the views of consumers when setting prices. Rather, Vector consulted with the Auckland Energy Consumer Trust (AECT), which represents consumers in the Auckland network. Vector also consulted with retailers on a range of pricing initiatives. Vector has considered and largely accommodated these views in its final prices.

9 IMPACT OF 2016/17 PRICE CHANGES

From 1 April 2016, Vector is incorporating an increase to the distribution component of prices by 0.8% as a result of increases to CPI (0.5%) and the inclusion of headroom from 2015/16 (0.3%).

From 1 April 2016, pass-through and recoverable costs (including transmission charges) are forecast to increase by 0.7%. However, changes to forecast volumes mean pass-through prices on average have decreased by 0.5%.

The combination of the increase in distribution prices of 0.8% and the decrease in pass-through prices of 0.5% results in an overall weighted average increase to Vector's prices of 0.3%. Individual prices may change by more or less than the overall weighted average price change.

9.1 Impact of 2015/16 prices changes on consumer groups

Table 18 shows the weighted average change to prices by consumer group. As these are weighted average price changes, some consumers will see a greater or lesser impact, depending on their consumption profile.

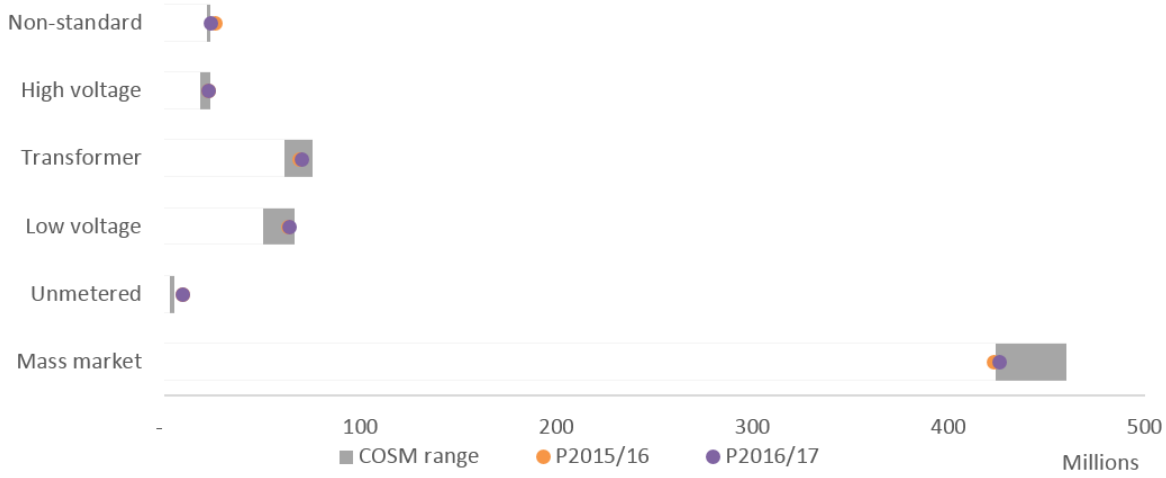
Table 18. Impact of weighted average price changes on consumer groups

Size	Consumer group	Price change
Large (>69kVA)	Non-standard[5]	-10.4%
	HV	1.1%
	TX	1.6%
	LV	1.1%
Small (≤69kVA)	Unmetered	0.7%
	Mass market	0.7%

Figure 4 below shows 2015/16 and 2016/17 prices compared with the desired COSM outcomes. The desired COSM output represent a range of acceptable allocations and is presented as a grey band while 2015/16 and 2016/17 prices are presented as orange and purple dots respectively. This shows how 2015/16 prices have moved towards the desired COSM outcome through the application of the Pricing Methodology. Note that in some cases the change is minor or nil.

[5] Non-standard revenue has decreased due to non-standard consumers moving to standard price categories.

Figure 4. 2015/16 and 2016/17 prices compared with COSM outcomes



10 NON-STANDARD PRICING

In certain circumstances Vector's published standard prices may not adequately reflect the actual costs of supplying a consumer, reflect the economic value of the service to the consumer or address the commercial risks associated with supplying that consumer. Non-standard contracts allow tailored or specific prices and non-standard Network Connection and Services Agreement (NCSA) commercial arrangements to be applied to individual points on the distribution system.

10.1 Non-standard target revenue

Of the target revenue for 2016/17 of $618.1m, $23.5m (4%) is recovered from 40 non-standard consumers.

10.2 Criteria for non-standard contracts

Vector has established assessment criteria to determine whether to apply non-standard pricing. Consumers may be assessed for non-standard terms or pricing if they meet one of the following criteria:

a) The capacity of the consumer's point of connection is greater than or equal to 1.5 MVA; or
b) The consumer's (forecast) maximum demand (twice the maximum kVAh half hourly reading) is greater than or equal to 1.5 MVA; or
c) The ratio of the consumer's (forecast) maximum demand over their (forecast) average demand in any year is greater than four; or
d) Vector incurs capital expenditure greater than $250k augmenting its electricity distribution network in order to provide electricity lines services to the consumer.

Vector assesses whether to apply non-standard pricing and the corresponding contractual arrangements to new consumers on a case by case basis. Generally, if a consumer does not meet at least one of the assessment criteria, they will be subject to published standard distribution prices. Meeting one or more of the assessment criteria does not mean that a non-standard arrangement will apply, merely that the consumer may be reviewed to determine whether standard pricing and standard contractual terms are suitable, given the consumer's individual circumstances.

For new investments that qualify for non-standard pricing, Vector uses actual costs and/or allocated costs derived from an allocation model to determine prices. This allocation model is consistent with the COSM used in determining standard pricing. The description provided under Section 12 to show consistency with the Pricing Principles therefore applies to the allocation model used for non-standard pricing.

For new non-standard investments, Vector applies a capital contributions policy. Vector's policy for determining capital contributions on Vector's electricity distribution networks is available at http://vector.co.nz/disclosures/electricity/capital-contributions.

10.3 Vector's obligations and responsibilities

A summary of Vector's obligations and responsibilities to consumers subject to non-standard contracts on Vector's networks (in the event that the supply of electricity lines services to the consumer is interrupted) is provided in Table 19.

Vector's standard contracts terms and non-standard contract terms are compared in Table 19 below:

Table 19. Summary of Vector's obligations and responsibilities to Non-standard consumers

	Planned interruption notice	Unplanned interruption notice	Fault restoration	Number of interruptions per annum	Number of consumers
Standard	4 days	15 mins	CBD/Industrial: 2 hours Urban: 2.5 hours Rural: 4.5 hours	Urban: 4 Rural: 10	Approx. 540,000
Non-standard	Same as standard	Same as standard	Same as standard	Same as standard	17
	1 April each year, or 10 working days	As soon as practicable	2 hours	1 unplanned	1
	1 April each year, or 10 working days	As soon as practicable	As soon as practicable	Not stated	1
	1 June each year	As soon as practicable	As soon as practicable	Not stated	2
	1 November each year	As soon as practicable	Priority	Not stated	2
	10 working days	As soon as practicable	3 hours	Not stated	7
	10 working days	Not stated	Not stated	Not stated	1
	30 working days	As soon as practicable	As soon as practicable	Not stated	1
	4 working days	As soon as practicable	3 hours	Not stated	5
	7 working days	As soon as practicable	Priority	3 planned	1
	August each year	Not stated	1 hour	Not stated	2

For the current pricing year Vector's obligations and responsibilities to consumers in the event that the supply of electricity lines services to them is interrupted have no implications for determining prices. Note, however, that consumers may receive consumer guarantee payments if fault restoration times are not met. These payments are not payable in respect of storm or force majeure events. These payments are not included in the process of determining prices for electricity lines services.

11 APPROACH TO PRICING DISTRIBUTED GENERATION

Vector's policies and procedures for installation and connection of distributed generation are in accordance with the requirements of Part 6 (Connection of distributed generation) of the Electricity Industry Participation Code 2010 (the Code).

Vector charges each distributed generator prior to them connecting to the network based on the fees set out in Part 6 of the Code. Vector does not charge for connections smaller than 10 kW.

Vector does not make Avoided Cost of Distribution payments to any distributed generators. Vector makes Avoided Cost of Transmission (ACOT) payments to four distributed generators.

Vector has not identified any short run incremental costs from injection of energy into the network so this price continues to be $0.0000/kWh from 1 April 2016 for all distributed generators.

Further information on Vector's policies for distributed generation can be found at http://vector.co.nz/electricity/distributed-generation.

12 CONSISTENCY WITH PRICING PRINCIPLES

The Electricity Authority's Pricing Principles provide an approach to developing pricing methodologies for electricity distribution services. This section demonstrates the extent to which the Pricing Methodology is consistent with the Pricing Principles.

12.1 Pricing Principle (a)

Pricing Principle (a) states that:

a) Prices are to signal the economic costs of service provision, by:

- *i. being subsidy free (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;*
- *ii. having regard, to the extent practicable, to the level of available service capacity;*
- *iii. and signalling, to the extent practicable, the impact of additional usage on future investment costs.*

Incremental Costs

The incremental cost test can be applied both for individual consumers and for groups of consumers. The incremental cost for an individual consumer is the cost of connecting that consumer to the network, and therefore excludes the cost of shared assets. The incremental cost for a group of consumers is the cost of connecting that group of consumers to the network, and includes the cost of assets shared by that group.

Vector's capital contributions policy ensures that individual consumers generally pay the costs of connecting them to the network.

Applying the incremental cost test at a group level is more stringent because it includes shared costs for the group. Revenues for the group must be higher than just the sum of the incremental cost for each individual consumer.

The allocation of all B and C asset costs directly to the Secondary and Tertiary connection types respectively ensures that these connection types pay at least the incremental cost of connecting them to the network.

Standalone costs

While Vector monitors the cost of alternative options for consumers, it can be difficult to apply these on a consumer-specific basis. In some instances, the economic value of the service, including where that is set by the cost of an alternative form of supply, may be notified to us by the consumer. In these situations this pricing principle is delivered through the operation of pricing principle (c), detailed below.

Available Service Capacity

The electricity distribution system consists of assets with significant capacity. When building the system, economies of scale exist such that the cost of installing an asset larger than that which is immediately required does not add significantly to the cost of network build. As a consequence many parts of the distribution system have spare capacity. In most cases, due to the availability of spare capacity, the short run cost of the next unit of

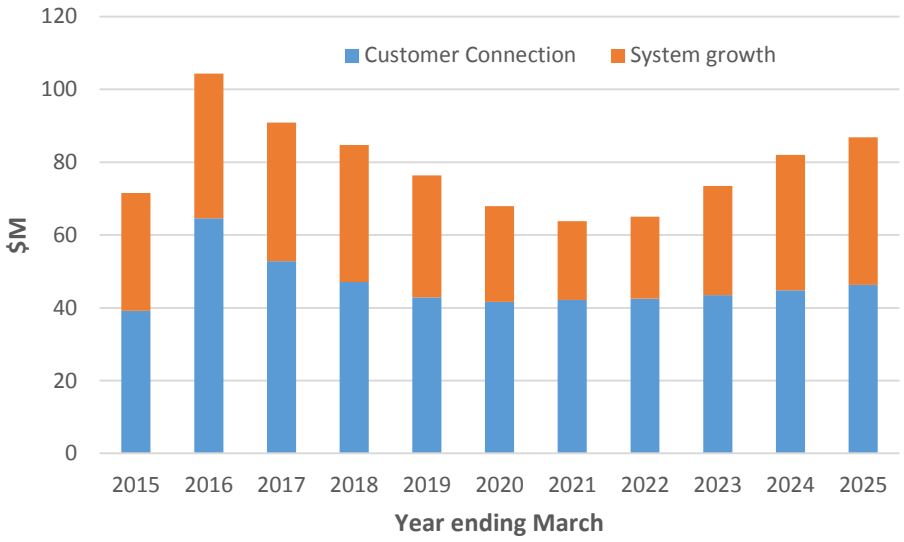
capacity is nil. To illustrate this point, Appendix 6 shows the utilisation[6] of zone substations and feeders from Vector's 2015 Asset Management Plan.

Appendix 6 also illustrates that some areas of the network have high utilisation. Where the system requires expansion, for example in order to connect a new user to the distribution system, then Vector generally funds this expansion through capital contributions and/or non-standard prices which ensure recovery of the incremental capital investment. Vector's approach to recovering these costs is outlined in its electricity distribution capital contribution policy.

Future Investment Costs

Figure 5 below shows Vector's forecast capital expenditure to meet future demand from Vector's 2015 Asset Management Plan[7]. Consumer connections allow for the costs of connecting new consumers and reticulating new subdivisions, while system growth relates to expansion of the network to provide the capacity to meet the electricity needs of these new connections.

Figure 5. Forecast Capital Expenditure to Meet Future Demand



Vector signals the level of available capacity and future investment costs over different time periods through the use of TOU prices and controlled load prices. This provides incentives to end consumers to shift demand away from peak periods and therefore reduce the need for future investment costs.

Vector generally applies this pricing at a high level. As technology improves and the uptake of TOU meters becomes more prevalent, we expect TOU capacity price signals to become more effective. Vector offers controlled load prices to residential end consumers in return for the ability to remotely manage the electricity supply of end consumers' hot water

[6] Asset utilisation in a distribution network is defined as the ratio between the peak demand conveyed by an asset (such as a feeder or a zone substation) and the capacity of the asset. It is a measure of what an asset is actually delivering against what it is capable of delivering.

[7] https://vector.co.nz/disclosures/electricity/amp

cylinders. This pricing approach signals the benefits to consumers of allowing Vector to control their hot water load and manage network congestion during peak periods through lower price options.

12.2 Pricing Principles (b) and (c)

Pricing Principles (b) and (c) state that:

b) *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.*

c) *Provided that prices satisfy (a) above, prices should be responsive to the requirements and circumstances of stakeholders in order to:*
   i. *discourage uneconomic bypass;*
   ii. *allow for negotiation to better reflect the economic value of services and enable stakeholders to make price/quality trade-offs or non-standard arrangements for services; and*
   iii. *where network economics warrant, and to the extent practicable, encourage investment in transmission and distribution alternatives (e.g. distributed generation or demand response) and technology innovation.*

Demand responsiveness

Pricing based on incremental costs would almost certainly under-recover allowed revenues as the majority of Vector's costs are fixed, so do not vary with the next unit of consumption. Our fixed costs are generally also sunk, so do not reduce if consumption reduces. Accordingly, the Pricing Methodology attempts to recover allowed target revenues in a manner that is as least distortionary as possible to investment decisions. As Vector has limited information of demand responsiveness by consumer group, we allocate the shortfall across all consumer groups using the COSM, as described in section 6.

Stakeholder circumstances

As described in section 10, Vector offers non-standard pricing in certain circumstances including where standard pricing would cause uneconomic bypass of the network.

Non-standard contractual arrangements are also able to address changes to the structure or level of prices (e.g. for atypical load patterns, or to address particular by-pass or fuel substitute situations), and differing service levels (e.g. a higher level of redundancy, or priority response if an outage occurs). The Pricing Methodology obliges Vector to take account of the issues described above when considering the design of a non-standard contract.

The Pricing Methodology does not provide specific incentives for investment in transmission and distribution alternatives. Where the connection of new load requires investment in the network (e.g. new subdivisions) then the cost of that investment is recovered via capital contributions and non-standard prices. Those prices provide the economic incentive for transmission and distribution alternatives to be investigated by the proponent of the development. For example, a new subdivision that utilises energy efficient buildings and solar heating or solar PV will not require the same level of network investment. Additional price signals beyond the requirements for capital contributions are not warranted by the economics of Vector's distribution network.

12.3 Pricing principle (d)

Pricing principle (d) states that:

d) *Development of prices should be transparent, promote price stability and certainty for stakeholders, and changes to prices should have regard to the impact on stakeholders.*

The existing Pricing Methodology for the electricity distribution system is transparent in that it is documented and is available to consumers and other stakeholders from Vector's website and is provided to them on request.

We have promoted price stability and have had regard to the impact on stakeholders by ensuring that, where practicable, changes to prices have been limited for most consumption patterns to be no more than 10% each year. Where possible we have signalled expected future increases in prices ahead of time so that consumers are able to factor such increases into their budgets. Vector has consulted with stakeholders, including retailers and the AECT, in the development of this Pricing Methodology and continues to consult as appropriate when applying it and future methodologies.

12.4 Pricing principle (e)

Pricing principle (e) of the Principles states that:

e) *Development of prices should have regard to the impact of transaction costs on retailers, consumers and other stakeholders and should be economically equivalent across retailers.*

In recent years Vector has simplified its distribution price structure so that the transaction costs on retailers, end consumers, and Vector are minimised. Vector offers retailers and the AECT the opportunity to comment on its proposed price structures each year. This provides an opportunity for these stakeholders to identify any proposals that may increase transaction costs, and provides Vector the opportunity to address any concerns they may have.

Vector offers the same network pricing to all end consumers irrespective of which retailer they use i.e. Vector does not provide any discounts or special terms to end consumers who are supplied by a particular retailer. The non-differentiation of network prices is outlined in the agreements that Vector has with retailers operating on the Vector network.

APPENDIX 1. GLOSSARY

Act: the Commerce Act 1986.

Allowable Notional Revenue: the revenue determined under the Price-Quality Path Determination that Vector is allowed to earn during the pricing year.

The Commerce Commission (the Commission): The Commission is an independent Crown entity established under section 8 of the Commerce Act 1986 responsible for competitive and regulated markets.

Connection or **Point of Connection:** each point of connection at which a supply of electricity may flow between the Distribution Network and the Consumer's installation.

Consumer: a purchaser of electricity from a Retailer where the electricity is delivered via the Distribution Network.

Consumer Group: a group of consumers who share the same connection type (eg Primary (high voltage), Secondary (transformer), or Tertiary) and, for Tertiary consumers, who share similar structural features (low voltage, unmetered, mass market)

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.

Default Price Path (the Price-Quality Path Determination): Electricity Distribution Default Price Quality Path Determination 2015

Demand: the rate of expending electrical energy expressed in kilowatts (kW) or kilovolt amperes (kVA).

Distributed Generator (DG): a party with whom Vector has an agreement for the connection of plant or equipment to Vector's electricity Distribution Network where the plant or equipment is capable of injecting electricity into Vector's distribution network.

Distribution Network or **Network:** the electricity distribution network in each area that Vector supplies distribution services, as defined by the following table:

Network	GXP	
Auckland	Hepburn	Penrose
	Hobson Street	Roskill
	Mangere	Takanini
	Otahuhu	Wiri
	Pakuranga	
Lichfield	Lichfield	
Northern	Albany	Silverdale
	Henderson	Wairau Road
	Hepburn	Wellsford

Distributor: the operator and owner of a Distribution Network.

EDB: Electricity Distribution Business

Electricity Authority (the Authority): the Electricity Authority which is an independent Crown entity responsible for regulating the New Zealand electricity market.

Grid Exit Point (GXP): a point of connection between Transpower's transmission system and the Distributor's Network.

High-Voltage (HV): voltage above 1,000 volts, generally 11,000 volts, for supply to Consumers.

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 electricity to a consumer.

kVA: kilovolt–ampere (amp), a measure of apparent power being the product of volts and amps. Used for the measurement of capacity and demand for capacity and demand prices.

kVAh: kilovolt ampere hour, a unit of energy being the product of apparent power in kVA and time in hours. Used for the measurement of power factor for power factor prices.

kVAr: kilovolt ampere reactive, is a unit used to measure reactive power in an AC electric power system. Used for the measurement of power factor for power factor prices.

kW: kilowatt, a measure of electrical power. Used for the measurement of demand during peak periods for the allocation of transmission charges.

kWh: kilowatt-hour, a unit of energy being the product of power in watts and time in hours. Used for the measurement of consumption for volume prices.

Line Prices: means the prices levied by the Distributor on consumers for the use of the Distribution Network, as described in the Pricing Schedule.

Low voltage (LV): voltage of value up to 1,000 volts, generally 230 or 400 volts for supply to Consumers.

Maximum Allowable Revenue (MAR): Starting price specified in Schedule 1 of the Price-Quality Path Determination that applies to the regulatory period 1 April 2015 to 31 March 2020.

Network: see Distribution Network.

Pass Through Costs: has the meaning specified in clause 3.1.2 of the Electricity Distribution Services Input Methodologies Determination 2012 (including all amendments).

Price Category: the relevant price category selected by the Distributor from the Price Schedule to define the Line Prices applicable to a particular ICP.

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

Pricing Principles: the pricing principles specified by the Electricity Authority in its Distribution Pricing Principles and Information Disclosure Guidelines (published 1 March 2010).

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

Pricing Year: the 12 month period from 1 April to 31 March each year.

Primary Connection Type: consumers who connect directly to Vector's HV network through consumer owned connection assets.

Recoverable Costs: has the meaning specified in clause 3.1.3 of the Electricity Distribution Services Input Methodologies Determination 2012 (including all amendments).

Regional Coincident Peak Demand (RCPD): for a Transmission Region, the sum of the offtake measured in kW in that Region during Regional Coincident Peak Demand Periods, as determined by Transpower each year. Where a Transmission Region is one of the four regional groups of connection locations (as defined in Transpower's Transmission Pricing Methodology), Upper North Island, Lower North Island, Upper South Island, and Lower South Island; and Regional Coincident Peak Demand Period means for the Upper North Island a half hour in which any of the 12 highest regional demands (measured in kW) occurs during 1 September to 30 August immediately prior to the start of the Pricing Year.

Retailer: the supplier of electricity to Consumers with installations connected to the Distribution Network.

Secondary Connection Type: consumers who connect directly to Vector's LV network through consumer owned connection assets.

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

Tertiary Connection Type: consumers who connect to Vector's LV network through Vector owned connection assets.

Time of Use Meter (TOU): metering that measures the electricity consumed for a particular period (usually half-hourly).

Transmission Costs: the transmission charges that Vector incurs from Transpower.

Transpower: means Transpower New Zealand Limited.

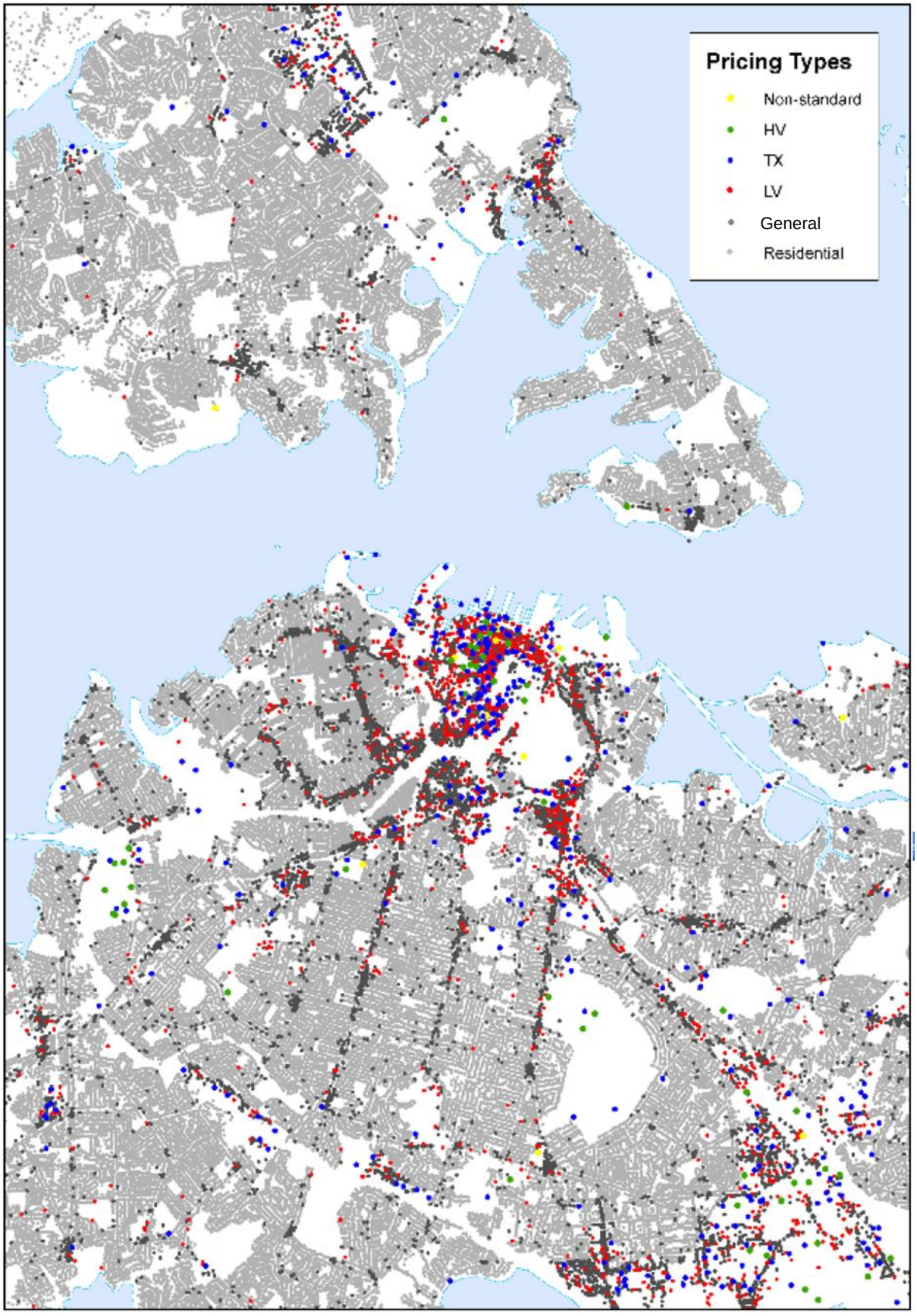
Vector: means Vector Limited.

APPENDIX 2. PRICING PRINCIPLES

Pricing Principles		
(a)	Prices are to signal the economic costs of service provision, by:	
	(i)	being subsidy free (equal to or greater than incremental costs, and less than or equal to stand alone costs), except where subsidies arise from compliance with legislation and/or other regulation;
	(ii)	having regard, to the extent practicable, to the level of available service capacity; and
	(iii)	signalling, to the extent practicable, the impact of additional usage on future investment costs.
(b)	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.	
(c)	Provided that prices satisfy (a) above, prices should be responsive to the requirements and circumstances of stakeholders in order to:	
	(i)	discourage uneconomic bypass;
	(ii)	allow for negotiation to better reflect the economic value of services and enable stakeholders to make price/quality trade-offs or non-standard arrangements for services; and
	(iii)	where network economics warrant, and to the extent practicable, encourage investment in transmission and distribution alternatives (e.g. distributed generation or demand response) and technology innovation.
(d)	Development of prices should be transparent, promote price stability and certainty for stakeholders, and changes to prices should have regard to the impact on stakeholders.	
(e)	Development of prices should have regard to the impact of transaction costs on retailers, consumers and other stakeholders and should be economically equivalent across retailers.	

APPENDIX 3. AUCKLAND AND NORTHERN ELECTRICITY DISTRIBUTION NETWORKS

APPENDIX 4. SPATIAL ILLUSTRATION OF PRICING TYPES

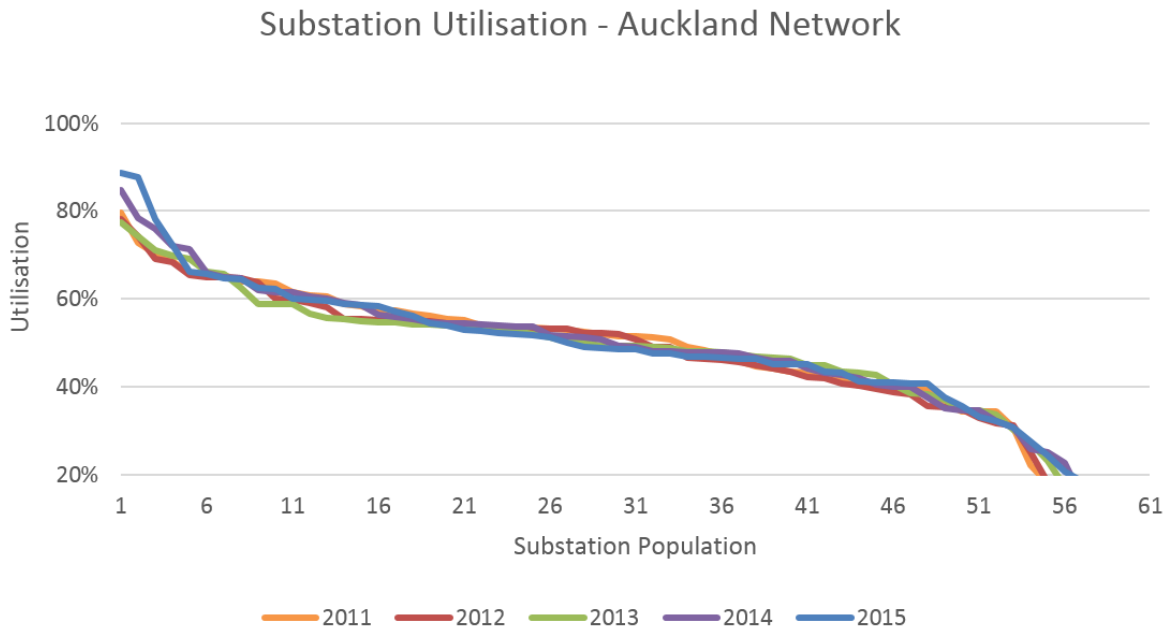


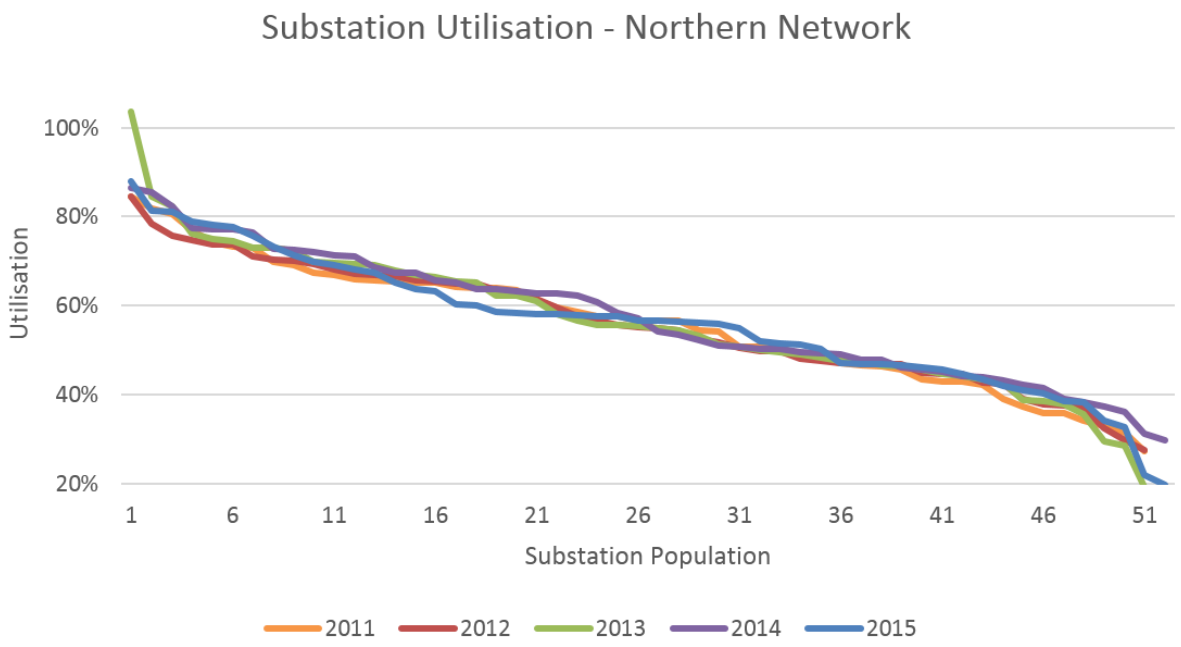
APPENDIX 5. PROPORTION OF TARGET REVENUE BY PRICE COMPONENT

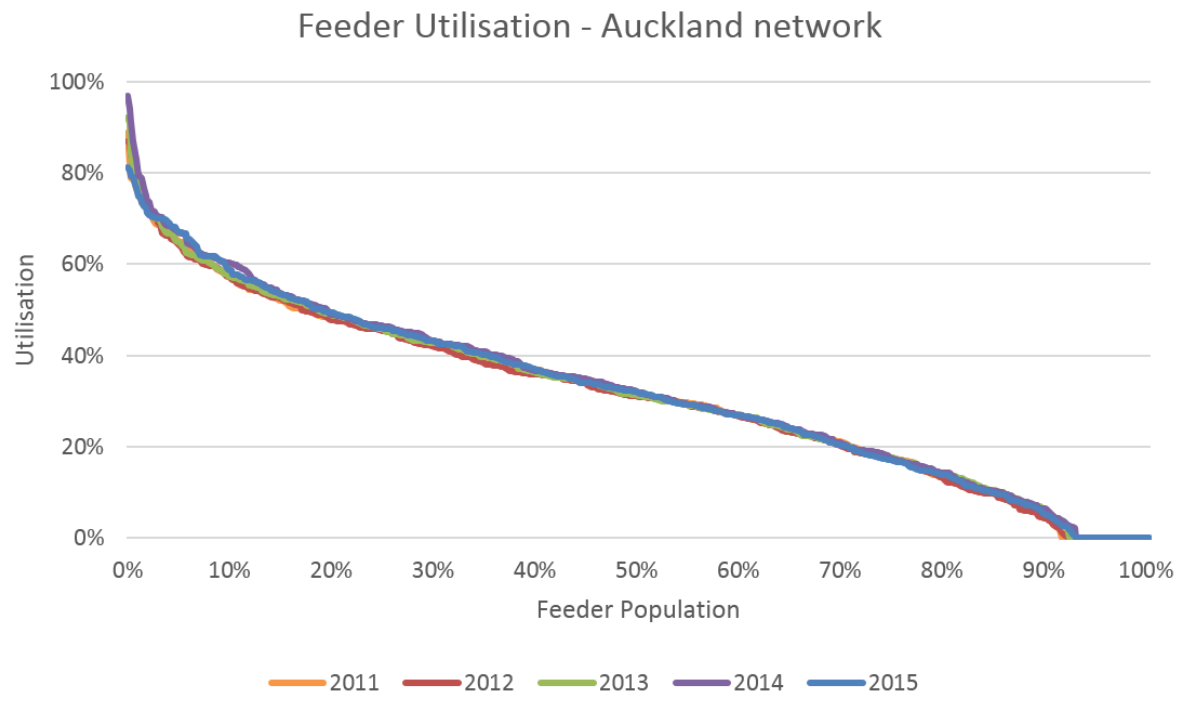
	Fixed		Variable		
	Daily	Capacity	Volumetric	Demand*	Powerfactor
WRCL	0.67%	-	6.12%	-	-
WRUL	0.05%	-	0.50%	-	-
WRGL	0.05%	-	0.50%	-	-
WRCS	5.22%	-	7.30%	-	-
WRUS	0.48%	-	0.68%	-	-
WRGS	0.48%	-	0.68%	-	-
WRHL	0.00%	-	0.00%	-	-
WRHS	0.00%	-	0.00%	-	-
WBSU	0.31%	-	0.22%	-	-
WBSN	1.27%	-	4.08%	-	-
WBSH	0.00%	-	0.00%	-	-
WLVN	0.26%	0.20%	0.95%	-	0.02%
WLVH	0.11%	0.08%	0.09%	0.35%	0.03%
WTXN	0.04%	0.05%	0.26%	-	0.02%
WTXH	0.14%	0.32%	0.32%	1.26%	0.08%
WHVN	0.00%	0.00%	0.00%	-	0.00%
WHVH	0.01%	0.05%	0.09%	0.29%	0.01%
ARCL	0.92%	-	8.31%	-	-
ARUL	0.14%	-	1.11%	-	-
ARGL	0.14%	-	1.11%	-	-
ARCS	6.52%	-	9.21%	-	-
ARUS	0.78%	-	1.11%	-	-
ARGS	0.78%	-	1.11%	-	-
ARHL	0.00%	-	0.00%	-	-
ARHS	0.00%	-	0.00%	-	-
ABSU	0.55%	-	0.42%	-	-
ABSN	2.00%	-	8.08%	-	-
ABSH	0.00%	-	0.00%	-	-
ALVN	0.18%	0.61%	2.21%	-	0.02%
ALVT	-	0.80%	1.56%	2.57%	0.33%
ATXN	0.01%	0.06%	0.18%	-	0.00%
ATXT	-	1.23%	2.82%	4.17%	0.31%
AHVN	0.00%	0.00%	0.01%	-	0.00%
AHVT	-	0.31%	1.11%	1.64%	0.10%
NS	3.80%	-	-	-	-

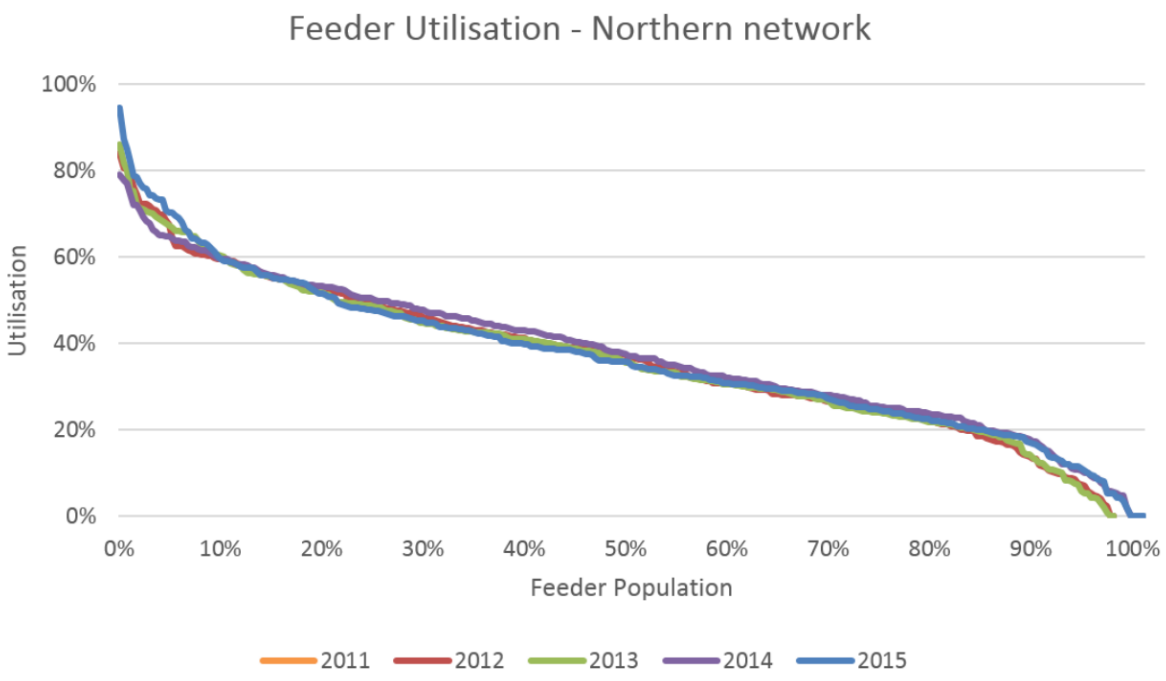
* Includes forecast Excess Demand

APPENDIX 6. UTILISATION OF VECTOR'S ASSETS






Feeder Utilisation - Auckland network
100%
80%
60%
40%
20%
0%
Utilisation
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Feeder Population
2011
2012
2013
2014
2015


Feeder Utilisation - Northern network
100%
80%
60%
40%
20%
0%
Utilisation
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Feeder Population
2011
2012
2013
2014
2015

Schedule 17 Certification for Year-beginning Disclosures

Clause 2.9.1

We, MICHAEL STIASSNY and

JONATHAN MASON, 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 Electricity 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 measured on a basis consistent with regulatory requirements or recognised industry standards.

Director

Director

25 February 2016

Date