Electricity Distribution Services Default Price-Quality Path Determination 2012

Annual Compliance Statement

30 May 2014

Assessment as at 31 March 2014

TABLE OF CONTENTS

1. INTRODUCTION

1.1. Background

1.1.1 This Annual Compliance Statement ("the Statement") is submitted by Vector Limited ("Vector") pursuant to *clause 11* of the Electricity Distribution Services Default Price-Quality Path Determination 2012 ("the Determination").

1.1.2 The Determination is issued pursuant to Part 4 of the Commerce Act 1986 and requires non-exempt suppliers of lines services ("EDB's") to provide information to the Commission relevant to the assessment of their performance against the price path and quality standards.

1.1.3 Under *clause 8* of the Determination an EDB's notional revenue must not exceed the allowable notional revenue during the current assessment period.

1.1.4 Under *clause 9* of the Determination an EDB's assessed reliability values either must not exceed the reliability limits for the current assessment period or must not have exceeded the reliability limit for either of the two immediately preceding extant assessment periods.

1.1.5 The Statement has been prepared on 30 May 2014. In the Statement, references to Vector relate only to Vector's electricity distribution business.

1.2. Statement of compliance

1.2.1 As required by clause 11.2(a) of the Determination, this Statement confirms Vector's compliance with the price path in clause 8 and the quality standards in clause 9 in respect of the assessment period ending on 31 March 2014.

1.2.2 As required by clause 11.3(j)(i) of the Determination this statement confirms that clauses 10.1, 10.2, 10.3 and 10.4 did not apply in respect of the assessment period ending on 31 March 2014

1.2.3 With reference to clause 11.3(k) of the Determination, it is confirmed that no System Fixed Assets were transferred from Transpower to Vector during this assessment period.

1.3. Disclaimer

1.3.1 The information contained in this Statement has been prepared for the express purpose of complying with the requirements of *clause 11* of the Determination. This statement has not been prepared for any other purpose. Vector expressly disclaims any liability to any other party who may rely on this statement for any other purpose.

1.3.2 For presentation purposes some numbers in this document have been rounded. In most cases calculations are based on more detailed numbers. This may cause small discrepancies or rounding inconsistencies when aggregating some of the information presented in this document. These discrepancies do not affect the overall compliance calculations which are based on the more detailed information.

2. PRICE PATH

2.1. Introduction

2.1.1 In this section Vector demonstrates that it has complied with the price path requirements (*clause 8*) of the Determination. Vector has provided information to support the statement of compliance including: the amount of allowable notional revenue, the amount of notional revenue, prices, quantities, units of measurement associated with all numeric data, the actual amount of pass through costs, the amount of forecast pass through costs used when setting prices, an explanation of variances between forecast and actual pass through costs and a description of the alternative approach used to demonstrate compliance with the price path following the restructure of prices.

2.2. Price path (clause 8 of the Determination)

2.2.1 As required by *clause 8* of the Determination, in order to demonstrate compliance with the price path, EDB's must demonstrate that their notional revenue during the assessment period has not exceeded the allowable notional revenue for the assessment period. The current assessment period is the fourth assessment period and covers the 12 months to 31 March 2014.

2.2.2 As outlined in the calculation below, Vector complies with the price path:

$$NR_t \leq R_t$$

$$NR_{2013/14} \leq R_{2013/14}$$

$$\$396,694,157 \leq \$396,704,998$$

2.2.3 Notional revenue for the 2013/14 assessment period:

$$NR_t = \sum P_{i,t} Q_{i,t-2} - K_t - V_t$$

$$NR_{2013/14} = \sum P_{i,2013/14} Q_{i,2011/12} - K_{2013/14} - V_{2013/14}$$

$$NR_{2013/14} = \$589,842,159 - \$9,683,096 - \$183,464,906$$

$$NR_{2013/14} = \$396,694,157$$

a) Details of $\sum P_{i,2013/14} Q_{i,2011/12}$ are included in Appendices 1 to 5

b) Details of $K_{2013/14}$ and $V_{2013/14}$ are included in Section 2.4

2.2.4 Allowable notional revenue for the fourth (2013/14) assessment period is set out in Schedule 1C of the Determination. Vector is a non-exempt EDB and is not listed in Table 3 of the Determination. Therefore equation 2 of the Determination specifies Vector's allowable notional revenue:

$$R_{2013/14} = \frac{MAR_{2013/14} + K_{2013/14} + V_{2013/14}}{\Delta D} - K_{2013/14} - V_{2013/14}$$

$$R_{2013/14} = \frac{\$416{,}760{,}000 + \$9{,}683{,}096 + \$183{,}464{,}906}{1.034}$$

$$- \$9{,}683{,}096 - \$183{,}464{,}906$$

$$R_{2013/14} = \$396{,}704{,}998$$

a) $MAR_{2013/14}$ is specified for each EDB in Schedule 1C, Table 4 of the Determination.
b) Details of $K_{2013/14}$ and $V_{2013/14}$ are included in Section 2.4 below.
c) ΔD is specified for each EDB in Schedule 1C, Table 4 of the Determination.

2.2.5 Information relating to prices following the restructure including all relevant quantities and units of measurement is included in Appendices 1 to 5.

2.3. Restructuring of prices

2.3.1 Vector has restructured the prices that apply during the assessment period.

2.3.2 *Clause 8.5(a)* of the Determination requires that if an EDB has restructured its prices that apply during an assessment period, it must demonstrate whether the restructure of itself increased allowable notional revenue above that which would have applied if the restructuring had not occurred. Where it is not possible to demonstrate the effects of the restructure on allowable notional revenue, then *clause 8.5(b)* requires EDB's to demonstrate whether the restructure of itself increased revenue above that which would have applied if the restructuring had not occurred.

2.3.3 As a consequence of having restructured the prices that apply during the assessment period Vector has considered how it may comply with the requirements of *clause 8.5(a)* or *clause 8.5(b)* of the Determination.

2.3.4 Vector has determined it cannot reasonably meet the requirements of *clause 8.5(a)* because price restructures in the assessment period *t* have no impact on allowable notional revenue in the same assessment period. In any assessment period other than the fourth assessment period, allowable notional revenue is determined by prices in the assessment period *t-1* not *t*. In the fourth assessment period, allowable notional revenue is specified by the Commission based on the MAR specified in Schedule 1C.

2.3.5 Vector has determined it cannot reasonably meet the requirements of *clause 8.5(b)* because it is not possible to know the revenue that would have been received had the price restructuring not occurred in the assessment period as the price restructuring did occur and non-restructured prices do not exist.

2.3.6 Therefore, as required by *clause 11.3(f)* of the Determination, Vector states that it has not applied *clause 8.5* in respect of the fourth Assessment period. Vector has instead applied *clause 8.6* and has used an alternative approach to demonstrate compliance.

2.3.7 Vector's approach includes; where practicable, tracing the historical quantity invoiced for the quantity period $Q_{i,2011/12}$, to each restructured price, or where this was not practicable estimating the quantities had the restructured prices applied. This approach is consistent with the revised restructure provisions in the Gas Distribution Services Default Price-Quality Path Determination 2013 which address the issues identified in paragraphs 2.3.44 and 2.3.5 above.

2.3.8 Vector's price restructure has consisted of the removal of the historical controlled and uncontrolled residential price plans and the introduction of new residential controlled and uncontrolled price plans, each with standard and low fixed charge price options. The low fixed charge options may be selected by retailers on behalf of consumers and result in lower line charges for consumers who use less than 8,000kWh per annum.

2.3.9 At the time of setting prices, historical quantity information corresponding to the new price structure did not exist. Vector therefore used its best estimate of the quantities for low fixed charge and standard options by mapping the actual quantities for the quantity period $Q_{i,2011/12}$ to the restructured prices. Any consumer who used less than 8,000kWh per annum during this period was mapped to the corresponding low fixed charge controlled or uncontrolled price plan, and conversely any consumer who used over 8,000kWh per annum was mapped to the standard plan.

2.3.10 In Appendix 6 we set out the quantities for the quantity period $Q_{i,2011/12}$ based on Vector's ex-ante allocation to the restructured price for the assessment period (where the allocation was made prior to the restructured prices taking effect). We have also included the same quantities for each consumer in the quantity period, reallocated ex-post on the basis of their actual selection of price plan at the end of the quantity period $Q_{i,2012/13}$.

2.3.11 There are differences between the ex-ante and ex-post allocated quantities in respect of the restructured prices. This primarily arises because not as many consumers as anticipated have selected the low fixed charge price option.

2.3.12 It is not practicable to ascertain in all cases why a consumer has not opted for a particular (more appropriate) price option, however this may have been caused by consumption patterns changing between the current and lagged quantity periods, a change of consumer at an ICP, a significant number of consumers being at or near the cross over point between standard and low fixed charge price options and facing limited incentives to change price plans or other factors.

2.4. Pass through and recoverable costs

2.4.1 Table 1 below provides the breakdown of pass-through costs and provides a comparison between the forecast pass-through and recoverable costs when prices were determined in December 2012 and actual pass-through and recoverable costs for the 2013/14 assessment period.

Table 1 - Summary of $K_{2013/14,forecast}$, $K_{2013/14}$, $V_{2013/14,forecast}$ and $V_{2013/14}$ for the 2013/14 assessment period

	$K_{2013/14,forecast}$	$K_{2013/14}$
Sum	**$ 10,047,209**	**$ 9,683,096**

Pass through costs

Description	$K_{2013/14,forecast}$	$K_{2013/14}$
Rates	$ 7,050,349	$ 7,005,502
Electricity Authority	$ 1,525,220	$ 1,032,541
Commerce Act Levies	$ 1,162,514	$ 1,431,310
EGCC Levies	$ 309,125	$ 213,744

	$V_{2013/14,forecast}$	$V_{2013/14}$
Sum	**$ 183,580,257**	**$ 183,464,906**

Recoverable costs

Description	$V_{2013/14,forecast}$	$V_{2013/14}$
Transmission charges	$ 183,580,257	$ 183,464,906

2.4.1 Variances between pass-through and recoverable costs used to set prices ($K_{2013/14,forecast}$ and $V_{2013/14,forecast}$ respectively) and the same costs measured at the end of the assessment period ($K_{2013/14}$ and $V_{2013/14}$ respectively) arise due to the need to forecast these costs, ex-ante, but the actual costs are determined ex-post. None of the costs are fully fixed and variances will naturally occur. We set out the main reason for these variances further below.

2.4.2 Variances in rates primarily arise due to the rates payable at the Hobson Street and Wairau Road GXP. These sites are new and are shared between Vector and Transpower with co-location of assets. Accordingly the rates are allocated between the parties, however the appropriate allocation was not known at the time of making the forecast.

2.4.3 Variances in Electricity Authority levies arise due to changes in the Electricity Authority unit rates and the quantities these rates are applied to (number of ICPs and MWh). Vector's forecast was based on the Electricity Authorities appropriations consultation paper, published 24 September 2012. The actual invoiced levy rate for year ending 30 June 2014 was much lower than what the Electricity Authority had proposed in their consultation. During the assessment period, Vector also received a refund from the Electricity Authority of $300,944, this was not foreseen in the forecast of Electricity Authority levies.

2.4.4 Variances in Commerce Act levies arise because the Commission has changed the way it has apportioned levies between electricity and gas regulated activities since Vector forecast these costs. Vector has based our forecasts on 2011 cabinet decisions for Commerce Commission funding until 2016. Vector had assumed a consistent increase across both gas and electricity, however the Commission has increased funding in some categories and decreased them in others. Commerce Act levies for the year ending 31 March 2010 have been included in K2014 consistent with clause 8.7 of the Determination. The amount of the Commerce Act levies that has been included is $281,527, which is 1/5 of the 2010 total of $1,407,633.

2.4.5 Variances in fixed Electricity and Gas Complaints Commission (the EGCC) levies arise because Vector's forecast for unit costs assumed a growth rate of 5%, consistent with previous increases. The unit costs for the year ending March 2014 has however decreased. There has been a significant reduction in cases considered by the EGCC for the year ending March 2014, when compared with the previous year.

2.4.6 Variances in transmission charges result from the delayed commissioning of the Hobson Street GXP. Vector's forecast of transmission charges assumed that this GXP would be commissioned on 1 October 2013, but the GXP was not commissioned until 26 February 2014.

3. QUALITY STANDARDS

3.1. Introduction

3.1.1 In this section Vector demonstrates that it has complied with the quality standards, *clause 9* of the Determination. Vector has provided information to support the statement of compliance including: assessed values and reliability limits for the assessment period, the annual reliability assessment for the two immediately preceding extant assessment periods, relevant SAIDI and SAIFI statistics and calculations, and a description of the policies and procedures for recording SAIDI and SAIFI statistics for the assessment period.

3.2. Quality standards (clause 9 of the Determination)

3.2.1 As required by *clause 9* of the Determination, in order to demonstrate compliance with the quality standards in respect of each assessment period, EDB's must demonstrate per *clause 9.1* that their quality standards either:

a) Comply with the annual reliability assessment specified in *clause 9.2* for that assessment period; or

b) Have complied with those annual reliability assessments for the two immediately preceding extant assessment periods.

3.2.2 Vector complies with the quality standards in accordance with *clause 9.1 (b),* i.e. having complied with *clause 9.2* for the two immediately preceding extant assessment periods. As outlined in the calculations below, Vector has exceeded the annual reliability assessment requirement for SAIDI specified in *clause 9.2* of the Determination for the assessment period ending on 31 March 2014.

3.3. Assessed values

3.3.1 SAIDI and SAIFI values were calculated for the assessment period 1 April 2013 to 31 March 2014, incorporating Class B and Class C interruption types (planned interruptions and unplanned interruptions originating within the system fixed assets) per connection point served during the period. Average connection point numbers for the year were used in the calculation.

Period	Non-Normalised Class B&C SAIDI	Non-Normalised Class B&C SAIFI
2014	151	1.45

3.3.2 Normalisation of the SAIDI assessment data set was then completed, as one instance of daily SAIDI exceeded B_{SAIDI} during the assessment period. For this one instance, the daily SAIDI value was replaced with B_{SAIDI}. As B_{SAIFI} was not exceeded on this date, no normalisation of the SAIFI assessment data was required. An explanation of the reasons for exceeding the SAIDI boundary value is provided in Appendix 7.

Date	SAIDI	B_{SAIDI}	SAIFI	B_{SAIFI}	Comment
07/11/2013	18.5	8.91	0.099	0.181	B_{SAIFI} not exceeded
Total	18.5		0.099		

3.3.3 Normalised results of this assessment period and the previous two assessment periods are summarised below. An explanation of the reasons for exceeding the SAIDI reliability limit for the 1 April 2013 to 31 March 2014 assessment period is provided in Appendix 8.

Period	Normalised $SAIDI_{ASSESS}$	$SAIDI_{LIMIT}$	SAIDI Outcome	Normalised $SAIFI_{ASSESS}$	$SAIFI_{LIMIT}$	SAIFI Outcome
2012	95.7	127	Not Exceeded	1.12	1.86	Not Exceeded
2013	95.8	127	Not Exceeded	1.01	1.86	Not Exceeded
2014	141	127	Exceeded	1.45	1.86	Not Exceeded

3.4. SAIDI reliability limit calculation

3.4.1 For the purposes of assessing compliance with the quality standards, Vector has calculated reliability limits and assessed values for SAIDI consistent with the process set out in *Schedule 2* of the Determination.

3.4.2 The non-zero dataset was constructed from those days where SAIDI value was greater than zero, using the reference dataset from 1 April 2004 to 31 March 2009:

Year	Sum of SAIDI
04/05	96.3
05/06	145.7
06/07	141.0
07/08	252.1
08/09	153.4

3.4.3 Vector's boundary values were calculated in accordance with the following formula:

$$B_{SAIDI} = e^{(\alpha SAIDI+2.5\beta SAIDI)}$$

$$B_{SAIDI} = e^{(-2.15+4.34)}$$

$$B_{SAIDI} = 8.91$$

3.4.4 Vector's reference dataset was then normalised to account for the following days where the daily SAIDI value was greater than B_{SAIDI}:

Year	Event Date	SAIDI
05/06	8/10/2005	16.5
	24/01/2006	21.5
05/06 Total		38.0
06/07	12/06/2006	18.3
	9/11/2006	12.4
06/07 Total		30.7
07/08	10/07/2007	150.4
07/08 Total		150.4
08/09	26/07/2008	52.8
08/09 Total		52.8

3.4.5 Vector's reliability limits were calculated in accordance with the following formula:

$SAIDI_{LIMIT} = \mu_{SAIDI}+\sigma_{SAIDI}$

$SAIDI_{LIMIT} = 114+13.3$

$SAIDI_{LIMIT} = 127$

3.4.6 μ_{SAIDI} was calculated in accordance with the following formula:

μ_{SAIDI} = ∑normalised daily SAIDI in reference data set / 5

$\mu_{SAIDI} = 570/5$

$\mu_{SAIDI} = 114$

3.4.7 σ_{SAIDI} was calculated in accordance with the following formula:

σ_{SAIDI} = standard deviation of daily SAIDI in reference data set × √365

$\sigma_{SAIDI} = 0.699 \times 19.1$

$\sigma_{SAIDI} = 13.3$

3.5. SAIFI reliability limit calculation

3.5.1 For the purposes of assessing compliance with the quality standards, Vector has calculated reliability limits and assessed values for SAIFI consistent with the process set out in S*chedule 2* of the Determination.

3.5.2 The non-zero dataset was constructed from those days where SAIFI value was greater than zero, using the reference dataset from 1 April 2004 to 31 March 2009:

Year	Sum of SAIFI
04/05	1.39
05/06	1.84
06/07	1.66
07/08	1.80
08/09	1.68

3.5.3 Vector's boundary values were calculated in accordance with the following formula:

$B_{SAIFI} = e^{(\alpha SAIFI+2.5\beta SAIFI)}$

$B_{SAIFI} = e^{(-6.50+4.80)}$

B_{SAIFI} = 0.181

3.5.4 Vector's reference dataset was then normalised to account for the following days where the daily SAIDI value was greater than B_{SAIDI} (see 3.4.3) and the daily SAIFI value was greater than B_{SAIFI} (see 3.5.3):

Year	Event Date	SAIDI	SAIFI
07/08	10/07/2007	150	0.254
07/08 Total		150	0.254
08/09	26/07/2008	52.8	0.205
08/09 Total		52.8	0.205

3.5.5 Vector's reliability limits were calculated in accordance with the following formula:

$SAIFI_{LIMIT} = \mu_{SAIFI}+\sigma_{SAIFI}$

$SAIFI_{LIMIT} = 1.66+0.203$

$SAIFI_{LIMIT} = 1.86$

3.5.6 μ_{SAIFI} was calculated in accordance with the following formula:

μ_{SAIFI} = ∑normalised daily SAIFI in reference data set / 5

μ_{SAIFI} = 8.28/5

μ_{SAIFI} = 1.66

3.5.7 σ_{SAIFI} was calculated in accordance with the following formula:

σ_{SAIFI} = standard deviation of daily SAIFI in reference data set × √365

σ_{SAIFI} = 0.011×19.10

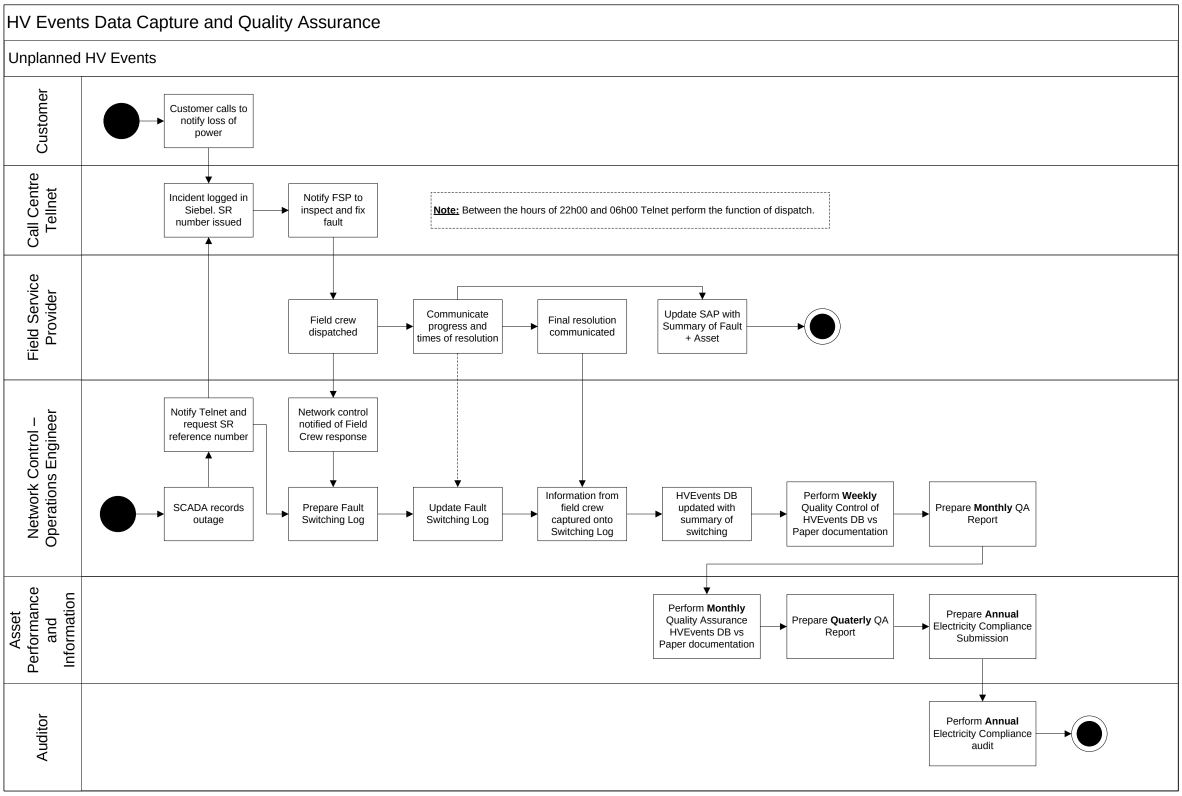
σ_{SAIFI} = 0.203

3.6. Policies and procedures for recording SAIDI and SAIFI

3.6.1 Vector's Electricity Operations Centre (EOC) is responsible for managing the electricity network. Resolution of planned and unplanned events is under direction of the duty control room engineer. The EOC also manages the network in accordance with Vector's standard ENG-0051 'Electricity network guidelines: HV Events data capture and quality assurance'. This standard defines the end-to-end process for capturing and reporting reliability performance data.

3.6.2 The majority of medium voltage and high voltage interruptions are monitored and controlled in real-time by the EOC through Vector's SCADA system. Where equipment is involved that is not SCADA enabled, it is operated by Vector's service providers, with communication to the EOC by radio. All planned and unplanned records are captured by the network control engineer both in hard copy (electricity fault switching log) and electronically (the HVEvents database described below). All interruptions are also logged and tracked separately in Vector's Customer Management System by Vector's customer services team.

3.6.3 Vector maintains a bespoke system for recording interruptions, HVEvents, which holds a replica of Vector's high voltage and medium voltage network structure, including customer numbers. The EOC engineers record details of all network interruptions, in accordance with the standard ENG-0051. For each interruption, the event type, location, duration and number of customers affected is identified. HVEvents is also used to prioritise network reconfiguration and restoration after an event. The figure below illustrates the HVEvents data capture process and the quality assurance carried out on outage information.



3.6.4 SAIDI and SAIFI are calculated in HVEvents for each interruption, and the data retained in a database for reporting and analysis.

3.6.5 Network performance and quality assurance is provided through ongoing review of all the data captured in HVEvents by the network performance team, comprising representatives from Asset Investment, Customer Services and Network Operations. Significant equipment-related incidents are cross-checked with the relevant asset engineer in order to identify root causes of incidents, and to put in place corrective actions as appropriate.

3.6.6 At year-end the period's average network customer base is calculated using the Gentrack billing and revenue system (averaging customers at the start and end of the year). The following reliability metrics are extracted from the HVEvents database for disclosure reporting:

- Interruption frequency and duration by class;
- Interruption frequency and duration by cause;
- Interruption frequency and duration by main equipment involved; and
- SAIDI/SAIFI/CAIDI (calculated using average customer count).

4. APPENDICES

Appendix 1: Summary of $P_{i,2013/14}Q_{i,2011/12}$ for the 2014 assessment period

	$P_{i,2013/14}Q_{i,2011/12}$
Sum	**$ 589,842,159**

Residential

	$P_{i,2013/14}Q_{i,2011/12}$
Northern published charges between 1 April 2013 to 31 March 2014	$ 199,712,285
Auckland published charges between 1 April 2013 to 31 March 2014	$ 363,275,657
Northern non-standard charges between 1 April 2013 to 31 March 2014	$ 2,097,454
Auckland non-standard charges between 1 April 2013 to 31 March 2014	$ 24,756,764

Appendix 2: Northern published charges from 1 April 2013

	$P_{i,2013/14} Q_{i,2011/12}$
Sum	**$ 199,712,285**

Residential

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
WRCL	WRCL-FIXD	Fixed	$/day	0.1500	36,609,867	$ 5,491,480
WRCL	WRCL-AICO	Variable, controlled	$/kWh	0.0913	511,439,982	$ 46,694,470
WRUL	WRUL-FIXD	Fixed	$/day	0.1500	5,151,647	$ 772,747
WRUL	WRUL-24UC	Variable, uncontrolled	$/kWh	0.1004	66,627,025	$ 6,689,353
WRCS	WRCS-FIXD	Fixed	$/day	0.8000	24,260,318	$ 19,408,254
WRCS	WRCS-AICO	Variable, controlled	$/kWh	0.0617	775,436,583	$ 47,844,437
WRUS	WRUS-FIXD	Fixed	$/day	0.8000	2,591,861	$ 2,073,489
WRUS	WRUS-24UC	Variable, uncontrolled	$/kWh	0.0708	88,144,174	$ 6,240,607
WRCH	WRCH-FIXD	Fixed	$/day	0.8000	-	$ -
WRCH	WRCH-OFPK	Variable, off peak (controlled)	$/kWh	0.0494	-	$ -
WRCH	WRCH-SHLD	Variable, shoulder (controlled)	$/kWh	0.0617	-	$ -
WRCH	WRCH-PEAK	Variable, peak (controlled)	$/kWh	0.0815	-	$ -
WRUH	WRUH-FIXD	Fixed	$/day	0.8000	-	$ -
WRUH	WRUH-OFPK	Variable, off peak (uncontrolle	$/kWh	0.0566	-	$ -
WRUH	WRUH-SHLD	Variable, shoulder (uncontrolle	$/kWh	0.0708	-	$ -
WRUH	WRUH-PEAK	Variable, peak (uncontrolled)	$/kWh	0.0935	-	$ -

Business

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
WBSU	WBSU-FIXD	Fixed	$/day/fitting	0.1300	13,081,879	$ 1,700,644
WBSU	WBSU-24UC	Variable	$/kWh	0.0873	19,805,584	$ 1,729,027
WBSN	WBSN-FIXD	Fixed	$/day	0.8000	7,768,253	$ 6,214,602
WBSN	WBSN-24UC	Variable	$/kWh	0.0708	392,985,814	$ 27,823,396

Low voltage

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
WLVC	WLVC-FIXD	Fixed	$/day	6.0000	58,196	$ 349,176
WLVC	WLVC-24UC	Variable	$/kWh	0.0389	58,904,857	$ 2,291,399
WLVC	WLVC-CAPY	Capacity	$/kVA/day	0.0183	12,994,321	$ 237,796
WLVC	WLVC-PWRF	Power Factor	$/kVAr/day	0.0658	-	$ -
WLVN	WLVN-FIXD	Fixed	$/day	5.0000	224,437	$ 1,122,185
WLVN	WLVN-24UC	Variable	$/kWh	0.0573	95,962,855	$ 5,498,672
WLVN	WLVN-CAPY	Capacity	$/kVA/day	0.0183	28,321,705	$ 518,287
WLVN	WLVN-PWRF	Power Factor	$/kVAr/day	0.0658	438,451	$ 28,850
WLVH	WLVH-FIXD	Fixed	$/day	10.0000	33,815	$ 338,150
WLVH	WLVH-24UC	Variable	$/kWh	0.0062	64,773,141	$ 401,593
WLVH	WLVH-CAPY	Capacity	$/kVA/day	0.0183	9,453,939	$ 173,007
WLVH	WLVH-DAMD	Demand	$/kVA/day	0.2716	4,938,816	$ 1,341,382
WLVH	WLVH-PWRF	Power Factor	$/kVAr/day	0.0658	593,457	$ 39,049

Transformer

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
WTXC	WTXC-FIXD	Fixed	$/day	5.4000	52,636	$ 284,234
WTXC	WTXC-24UC	Variable	$/kWh	0.0350	55,625,762	$ 1,946,902
WTXC	WTXC-CAPY	Capacity	$/kVA/day	0.0165	13,177,948	$ 217,436
WTXC	WTXC-PWRF	Power Factor	$/kVAr/day	0.0658	-	$ -
WTXN	WTXN-FIXD	Fixed	$/day	4.5000	9,423	$ 42,404
WTXN	WTXN-24UC	Variable	$/kWh	0.0516	4,245,025	$ 219,043
WTXN	WTXN-CAPY	Capacity	$/kVA/day	0.0165	2,868,436	$ 47,329
WTXN	WTXN-PWRF	Power Factor	$/kVAr/day	0.0658	83,231	$ 5,477
WTXH	WTXH-FIXD	Fixed	$/day	9.0000	67,536	$ 607,824
WTXH	WTXH-24UC	Variable	$/kWh	0.0056	312,286,437	$ 1,748,804
WTXH	WTXH-CAPY	Capacity	$/kVA/day	0.0165	60,204,844	$ 993,380
WTXH	WTXH-DAMD	Demand	$/kVA/day	0.2635	24,925,699	$ 6,567,922
WTXH	WTXH-PWRF	Power Factor	$/kVAr/day	0.0658	1,520,654	$ 100,059

High voltage

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
WHVN	WHVN-FIXD	Fixed	$/day	4.3700	-	$ -
WHVN	WHVN-24UC	Variable	$/kWh	0.0501	-	$ -
WHVN	WHVN-CAPY	Capacity	$/kVA/day	0.0160	-	$ -
WHVN	WHVN-PWRF	Power Factor	$/kVAr/day	0.0658	-	$ -
WHVH	WHVH-FIXD	Fixed	$/day	8.7300	4,514	$ 39,407
WHVH	WHVH-24UC	Variable	$/kWh	0.0054	68,285,304	$ 368,741
WHVH	WHVH-CAPY	Capacity	$/kVA/day	0.0160	9,736,700	$ 155,787
WHVH	WHVH-DAMD	Demand	$/kVA/day	0.2556	5,194,030	$ 1,327,594
WHVH	WHVH-DEXA	Excess demand	$/kVA/day	0.6390	-	$ -
WHVH	WHVH-PWRF	Power Factor	$/kVAr/day	0.0658	271,827	$ 17,886

Appendix 3: Auckland published charges from 1 April 2013

	$P_{i,2013/14} Q_{i,2011/12}$
Sum	**$363,275,657**

Residential

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
ARCL	ARCL-FIXD	Fixed	$/day	0.1500	50,286,115	$ 7,542,917
ARCL	ARCL-AICO	Variable, controlled	$/kWh	0.0878	699,964,044	$ 61,456,843
ARUL	ARUL-FIXD	Fixed	$/day	0.1500	14,739,569	$ 2,210,935
ARUL	ARUL-24UC	Variable, uncontrolled	$/kWh	0.0966	162,200,058	$ 15,668,526
ARCS	ARCS-FIXD	Fixed	$/day	0.8000	30,531,426	$ 24,425,141
ARCS	ARCS-AICO	Variable, controlled	$/kWh	0.0582	968,593,070	$ 56,372,117
ARUS	ARUS-FIXD	Fixed	$/day	0.8000	4,675,108	$ 3,740,086
ARUS	ARUS-24UC	Variable, uncontrolled	$/kWh	0.0670	163,033,470	$ 10,923,242
ARCH	ARCH-FIXD	Fixed	$/day	0.8000	-	$ -
ARCH	ARCH-OFPK	Variable, off peak (controlled	$/kWh	0.0466	-	$ -
ARCH	ARCH-SHLD	Variable, shoulder (controlled	$/kWh	0.0582	-	$ -
ARCH	ARCH-PEAK	Variable, peak (controlled)	$/kWh	0.0769	-	$ -
ARUH	ARUH-FIXD	Fixed	$/day	0.8000	-	$ -
ARUH	ARUH-OFPK	Variable, off peak (uncontroll	$/kWh	0.0536	-	$ -
ARUH	ARUH-SHLD	Variable, shoulder (uncontrol	$/kWh	0.0670	-	$ -
ARUH	ARUH-PEAK	Variable, peak (uncontrolled)	$/kWh	0.0885	-	$ -

Business

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
ABSU	ABSU-FIXD	Fixed	$/day/fitting	0.1300	19,989,347	$ 2,598,615
ABSU	ABSU-24UC	Variable	$/kWh	0.0733	31,442,253	$ 2,304,717
ABSN	ABSN-FIXD	Fixed	$/day	0.8000	12,426,991	$ 9,941,593
ABSN	ABSN-24UC	Variable	$/kWh	0.0670	773,961,251	$ 51,855,404

Low voltage

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
ALVN	ALVN-FIXD	Fixed	$/day	1.5000	664,451	$ 996,677
ALVN	ALVN-24UC	Variable	$/kWh	0.0637	213,894,353	$ 13,625,070
ALVN	ALVN-CAPY	Capacity	$/kVA/day	0.0320	100,450,580	$ 3,214,419
ALVN	ALVN-PWRF	Power Factor	$/kVAr/day	0.0658	165,870	$ 10,914
ALVH	ALVH-SMDY	Variable, summer day	$/kWh	0.0147	242,537,155	$ 3,565,296
ALVH	ALVH-SMNT	Variable, summer night	$/kWh	0.0023	87,093,017	$ 200,314
ALVH	ALVH-WNDY	Variable, winter day	$/kWh	0.0405	178,455,875	$ 7,227,463
ALVH	ALVH-WNNT	Variable, winter night	$/kWh	0.0023	64,739,635	$ 148,901
ALVH	ALVH-CAPY	Capacity	$/kVA/day	0.0320	129,142,727	$ 4,132,567
ALVH	ALVH-DAMD	Demand	$/kVA/day	0.2716	52,338,817	$ 14,215,223
ALVH	ALVH-PWRF	Power Factor	$/kVAr/day	0.0658	8,013,792	$ 527,308

Transformer

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
ATXN	ATXN-FIXD	Fixed	$/day	1.4600	47,264	$ 69,005
ATXN	ATXN-24UC	Variable	$/kWh	0.0618	17,067,957	$ 1,054,800
ATXN	ATXN-CAPY	Capacity	$/kVA/day	0.0310	11,648,779	$ 361,112
ATXN	ATXN-PWRF	Power Factor	$/kVAr/day	0.0658	13,327	$ 877
ATXH	ATXH-SMDY	Variable, summer day	$/kWh	0.0143	418,171,286	$ 5,979,849
ATXH	ATXH-SMNT	Variable, summer night	$/kWh	0.0022	171,857,702	$ 378,087
ATXH	ATXH-WNDY	Variable, winter day	$/kWh	0.0393	310,829,902	$ 12,215,615
ATXH	ATXH-WNNT	Variable, winter night	$/kWh	0.0022	127,842,187	$ 281,253
ATXH	ATXH-CAPY	Capacity	$/kVA/day	0.0310	187,170,242	$ 5,802,278
ATXH	ATXH-DAMD	Demand	$/kVA/day	0.2635	83,728,140	$ 22,062,365
ATXH	ATXH-PWRF	Power Factor	$/kVAr/day	0.0658	8,381,763	$ 551,520

High voltage

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14} Q_{i,2011/12}$
AHVN	AHVN-FIXD	Fixed	$/day	1.4200	424	$ 602
AHVN	AHVN-24UC	Variable	$/kWh	0.0599	138,109	$ 8,273
AHVN	AHVN-CAPY	Capacity	$/kVA/day	0.0301	219,600	$ 6,610
AHVN	AHVN-PWRF	Power Factor	$/kVAr/day	0.0658	-	$ -
AHVH	AHVH-SMDY	Variable, summer day	$/kWh	0.0139	168,859,503	$ 2,347,147
AHVH	AHVH-SMNT	Variable, summer night	$/kWh	0.0021	75,541,709	$ 158,638
AHVH	AHVH-WNDY	Variable, winter day	$/kWh	0.0381	125,781,633	$ 4,792,280
AHVH	AHVH-WNNT	Variable, winter night	$/kWh	0.0021	56,418,783	$ 118,479
AHVH	AHVH-CAPY	Capacity	$/kVA/day	0.0301	50,837,649	$ 1,530,213
AHVH	AHVH-DAMD	Demand	$/kVA/day	0.2556	32,965,632	$ 8,426,016
AHVH	AHVH-DEXA	Excess demand	$/kVA/day	0.6390	119,288	$ 76,225
AHVH	AHVH-PWRF	Power Factor	$/kVAr/day	0.0658	2,281,549	$ 150,126

Appendix 4: Northern non-standard charges from 1 April 2013

	$P_{i,2013/14}Q_{i,2011/12}$
Sum	**$ 2,097,454**

Non-standard

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14}Q_{i,2011/12}$
WN01			$/year	464,435	1	$ 464,435
WN02			$/year	-	1	$ -
WN03			$/year	195,632	1	$ 195,632
WN04			$/year	207,733	1	$ 207,733
WN05			$/year	54,375	1	$ 54,375
WN06			$/year	263,456	1	$ 263,456
WN07			$/year	669,512	1	$ 669,512
WN08			$/year	24,960	1	$ 24,960
WN09			$/year	376,740	1	$ 376,740
WN10			$/year	-	1	$ -
WPR1			$/year	- 159,389	1	-$ 159,389

Appendix 5: Auckland non-standard charges from 1 April 2013

	$P_{i,2013/14}Q_{i,2011/12}$
Sum	**$ 24,756,764**

Non-standard

Price plan	Code	Description	Units	$P_{i,2013/14}$	$Q_{i,2011/12}$	$P_{i,2013/14}Q_{i,2011/12}$
AN01			$/year	147,230	1	$ 147,230
AN02			$/year	209,053	1	$ 209,053
AN03			$/year	1,097,846	1	$ 1,097,846
AN04			$/year	143,579	1	$ 143,579
AN05			$/year	83,003	1	$ 83,003
AN06			$/year	-	1	$ -
AN07			$/year	1,198,086	1	$ 1,198,086
AN08			$/year	182,007	1	$ 182,007
AN09			$/year	35,018	1	$ 35,018
AN10			$/year	590,809	1	$ 590,809
AN11			$/year	249,563	1	$ 249,563
AN12			$/year	1,187,739	1	$ 1,187,739
AN13			$/year	503,029	1	$ 503,029
AN14			$/year	899,859	1	$ 899,859
AN15			$/year	1,550,788	1	$ 1,550,788
AN16			$/year	4,485,069	1	$ 4,485,069
AN17			$/year	401,844	1	$ 401,844
AN18			$/year	334,081	1	$ 334,081
AN19			$/year	412,346	1	$ 412,346
AN20			$/year	542,836	1	$ 542,836
AN21			$/year	140,788	1	$ 140,788
AN22			$/year	206,913	1	$ 206,913
AN23			$/year	783,850	1	$ 783,850
AN24			$/year	2,592,470	1	$ 2,592,470
AN25			$/year	848,284	1	$ 848,284
AN26			$/year	287,023	1	$ 287,023
AN27			$/year	217,431	1	$ 217,431
AN28			$/year	641,867	1	$ 641,867
AN29			$/year	45,011	1	$ 45,011
AN30			$/year	524,515	1	$ 524,515
AN31			$/year	162,814	1	$ 162,814
AN32			$/year	245,438	1	$ 245,438
AN33			$/year	294,280	1	$ 294,280
AN34			$/year	344,933	1	$ 344,933
AN35			$/year	104,406	1	$ 104,406
AN36			$/year	585,488	1	$ 585,488
AN37			$/year	817,058	1	$ 817,058
AN38			$/year	-	1	$ -
AN39			$/year	625,739	1	$ 625,739
AN40			$/year	941,858	1	$ 941,858
AN41			$/year	399,284	1	$ 399,284
APR1			$/year	- 306,468	1	-$ 306,468

Appendix 6: Quantities for restructured prices

Price plan	Code	Description	Units	Ex-ante $Q_{2011/12}$	Ex-post $Q_{2011/12}$
WRCL	WRCL-FIXD	Fixed	$/day	36,609,867	26,812,023
WRCL	WRCL-AICO	Variable, controlled	$/kWh	511,439,982	406,697,770
WRUL	WRUL-FIXD	Fixed	$/day	5,151,647	3,884,251
WRUL	WRUL-24UC	Variable, uncontrolled	$/kWh	66,627,025	54,733,657
WRCS	WRCS-FIXD	Fixed	$/day	24,260,318	33,400,384
WRCS	WRCS-AICO	Variable, controlled	$/kWh	775,436,583	867,300,977
WRUS	WRUS-FIXD	Fixed	$/day	2,591,861	4,517,034
WRUS	WRUS-24UC	Variable, uncontrolled	$/kWh	88,144,174	112,915,359
ARCL	ARCL-FIXD	Fixed	$/day	50,286,115	37,334,835
ARCL	ARCL-AICO	Variable, controlled	$/kWh	699,964,044	553,712,794
ARUL	ARUL-FIXD	Fixed	$/day	14,739,569	11,016,156
ARUL	ARUL-24UC	Variable, uncontrolled	$/kWh	162,200,058	128,752,752
ARCS	ARCS-FIXD	Fixed	$/day	30,531,426	42,832,759
ARCS	ARCS-AICO	Variable, controlled	$/kWh	968,593,070	1,102,437,889
ARUS	ARUS-FIXD	Fixed	$/day	4,675,108	9,048,468
ARUS	ARUS-24UC	Variable, uncontrolled	$/kWh	163,033,470	208,887,206

Appendix 7: Major Event Day Explanation

Event Description

The Vector network experienced a single major event day (MED) during the RY14 period. This excursion was the direct result of a single point asset failure.

The single point asset failure occurred on the 7/11/13 at 6.38pm, the responsible asset was a 33kV Nissin KOR type bulk oil circuit breaker located within the outdoor 33kV section of the Hepburn Rd Grid Exit Point. The resulting outage affected all downstream customers supplied via Hepburn Rd, some 47,000 customers.

The internal breaker failure resulted in the complete loss of the breaker as both yellow phase bushings were ejected from the breaker together with oil and arc products causing significant collateral damage to both the Transpower 33kV outdoor bus structure and adjacent Vector owned P1192 circuit breaker.

Event Impact

Due to the 33kV isolation of the Hepburn Rd Grid Exit Point, large areas of West Auckland were impacted with a total of 47,000 customers affected, some experiencing nearly a five hour outage. The SAIDI impact of this single event was 17.3 minutes, the associated SAIFI impact was 0.09.

To qualify as a major event day, the associated outage impact on SAIDI or SAIFI from single or multiple events observed during the span of that day needs to exceed the following boundary values, determined for Vector as;

- MED SAIDI boundary value = 8.91 minutes
- MED SAIFI boundary value = 0.181 interruptions

The SAIDI impact from the Hepburn Event on 07/11/13 contributed 17.3 minutes with the SAIDI impact from all other outage events on 07/11/13 contributing a further 1.2 minutes. The MED SAIFI boundary value was not exceeded.

As the MED SAIDI boundary value of 8.91 minutes has been exceeded, the SAIDI value for 07/11/13 is capped at 8.91 minutes, resulting in 9.6 minutes being removed from Vector's SAIDI total, as part of the normalisation process.

Investigation and Follow-Up Actions

The faulty circuit breaker (a Nissin Electric Type KOR manufactured in 1969) was inspected by Vector specialists and other industry experts. Findings were inconclusive but it is believed that the fault may have resulted from a nearby lightning strike. It was noted that on this particular switch, no lightning arrestor was installed on the incoming circuit.

The historical maintenance records of this and similar equipment were reviewed and found to meet the prevailing standards. Although a number of the same switch type have previously failed on Transpower's network, these failures are believed to be unrelated. Vector's investigations could not find any previous switch failures associated with this type of failure.

Vector has taken a number of measures to mitigate future failures of this switch type. They include;

- Lightning arrestors are being installed on critical incoming circuits to reduce the impact of lightning strikes.

- Historical test records for other similar switches (timing tests, bushing insulation tests, oil dielectric readings) were analysed for indications of distressed equipment. No issues were found.
- A safety notice specific to this event was published on the EEA website for other industry users to reference.
- The switch type involved is an outdoor unit owned and maintained by Vector but situated at a Transpower yard. Transpower plans to convert these yards to indoor use over the course of the next few years, and at Vector's request, they have agreed to accelerate some of these works. This will facilitate the replacement of many similar units with modern, reliable indoor equivalents.

Appendix 8: Explanation for Exceeding 2014 Reliability Limit

During RY14, Vector exceeded the annual regulatory SAIDI reliability limit. This is the first instance within the current regulatory period where Vector has not complied with the annual reliability assessment.

From Figure 1 below, it can be seen that with the exception of RY14, performance during the current DPP regulatory period (RY10 onwards) has been good, with far less volatility than the reference period (RY05-RY09). Annual results have been variable but no trend of declining reliability performance is evident.

This is the first time Vector has exceeded the current SAIDI reliability limit in the last 7 years. As this limit is set one standard deviation above the average, statistically speaking (assuming a normal distribution around the average), Vector would expect to exceed this limit 16% of the time (once every 6 years).

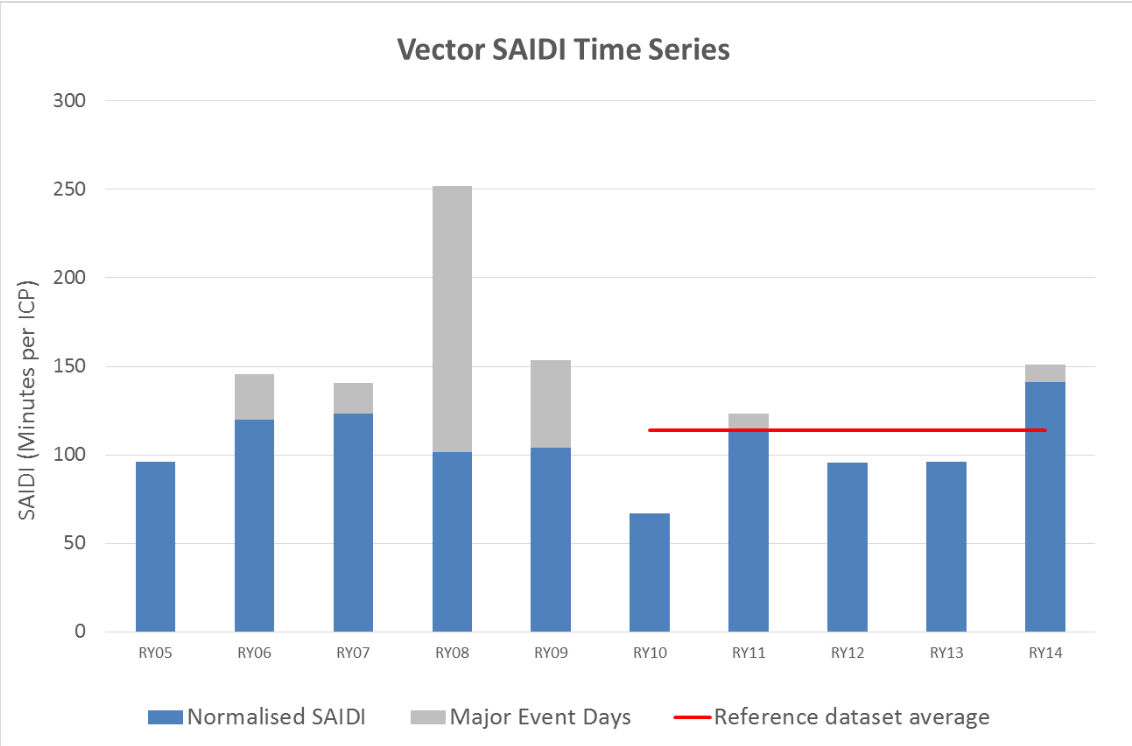


Figure 1 – Historical SAIDI performance

We do not believe that this result reflects a general deterioration in network quality. As can be seen from the data in Figure 1 above and Table 2 below, network performance has, on average, been better over the last five years compared with the five years in the reference period. The table below shows that this is the case in both normalised and non-normalised terms.

Date Range	SAIDI		SAIFI	
	Normalised	Non-normalised	Normalised	Non-normalised
Reference period (2005-2009)	111	158	1.64	1.75
Last five years (2010-2014)	103	107	1.17	1.17

Table 2 – Comparison of reliability performance over the last two regulatory periods

The specific circumstances on the 2014 year are discussed below.

The one-off asset failure at Hepburn Road (refer to Appendix 7 for details) resulted in the year's only Major Event Day (MED) where the day's SAIDI total exceeded the boundary value. After a thorough investigation, the Hepburn Rd MED event is considered by Vector to be a one-off incident, and very unlikely to reoccur. Given the nature of the failure, it cannot be used as an indicator of the underlying integrity or ongoing quality of the network. Following the investigation into the Hepburn Rd incident a number of mitigations have been implemented that will further reduce the likelihood of a similar event (on this equipment type) occurring in the future.

The most volatile causal factor impacting the achievement of annual quality standards continues to be the impact of high wind speed weather events. With the exception of the RY14 single point asset failure event, all of Vector's previous Major Event Days over the past decade have been due to high wind speed weather events. The observed impact of excessive wind speed events has resulted in significant network damage due to direct tree fall or indirect branch contact, wind-blown debris, line clashing and wind actions causing mechanical overstressing of overhead assets.

High Wind Speed Network Performance

Major event days resulting from high wind speed weather events are typically accompanied by both heavy rain and lightning; coincident lightning events tend to compound the amount of network damage experienced, however the damage and fault causality of the coincident heavy rains is relatively minor.

In order to demonstrate the relationship between high wind speed events and system performance, Figure 2 below depicts daily fault counts experienced in relation to measured sustained daily peak wind speeds. Days which exceeded the MED SAIDI boundary value for the corresponding regulatory period have been included, highlighted as red squares.

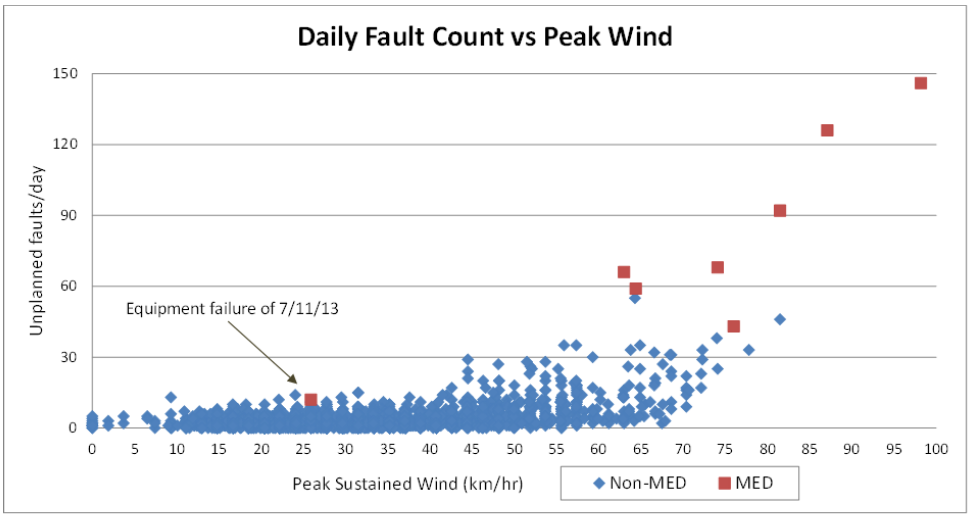


Figure 2 - Daily fault count compared against the measured sustained daily peak wind speeds[1]

[1] Data taken from 01/04/2005 to 31/03/2014 (RY06 to RY14). Daily peak wind speed data has been sourced from the Met Service's Whangaparoa monitoring station, located within a representative area of Vector's network. Only one station was selected for the purpose of this indicative analysis - highly localised wind patterns may therefore not have been fully captured or represented. However, for this type of analysis, this is not considered to be significant to the overall high level trends.

As can be seen from Figure 2, as the wind speed increases so does the volatility or deviation in the observed fault counts. There is relatively tight banding of fault counts in the block of wind speed from 0-45 km/hr, with this banding spreading slightly up to about 60 km/hr. Beyond 60 km/hr the band spreads again, with the correlation to major event days easy to observe. Extreme wind speeds tend to generate an 'avalanche' of network faults at the same time, as well as often making conditions unsafe in which perform restoration tasks – both resulting in more extreme SAIDI performance.

To help further visually depict the relationship with wind speed and SAIDI, Figure 3 plots wind pressure[2] on days where wind was >60km/hr against SAIDI for the year. It can be seen that there is a strong relationship between high wind pressure and high SAIDI, with RY05 and RY07 being slight anomalies in this pattern over a 10 year period.

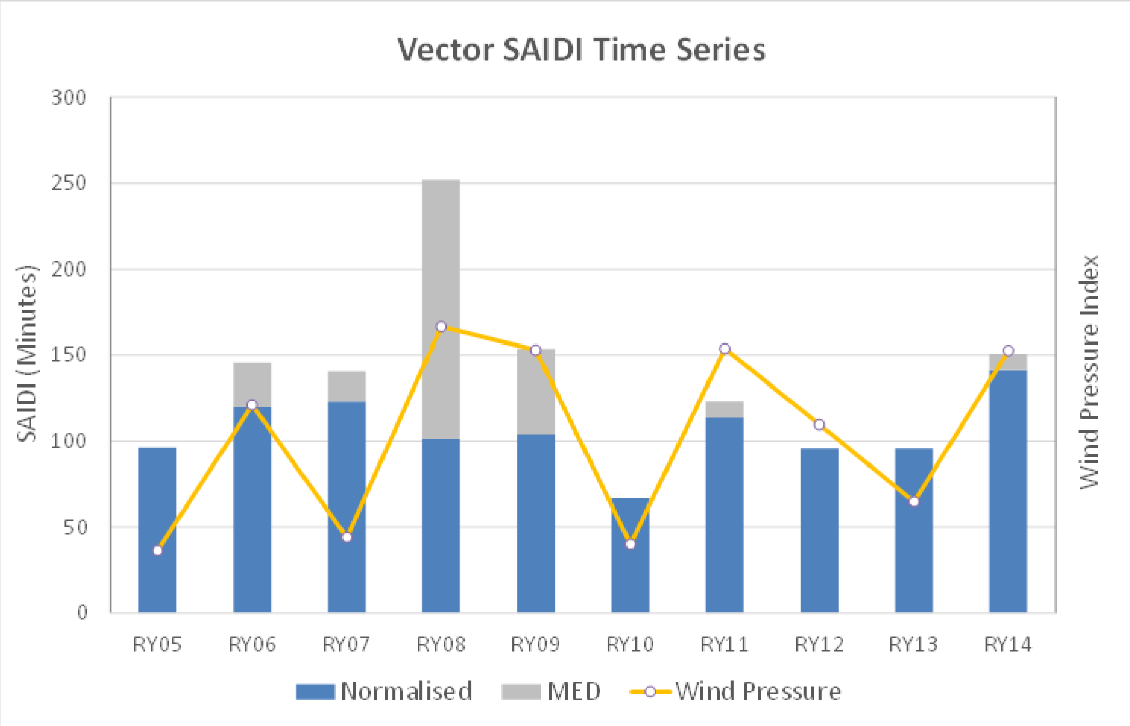


Figure 3 – Relationship between wind pressure for wind speeds >60km/hr, and network SAIDI performance

Vector's network is predicated on the ability to withstand 'normal' wind speed weather conditions. Very few structural failures have occurred during high winds, however overhead accessories have been observed to fail. The main cause of damage during high winds is related to falling vegetation and debris damage. A significant factor which adds to the variability in correlating network reliability with wind speed is 'out-of-zone' vegetation from airborne debris. 'Out-of-zone' vegetation is that not in the cut-zone of the overhead assets, and therefore not managed through Vector's vegetation management programme.

Did the Network Experience More or Less High Wind Speed Days Compared to Previous Regulatory Years?

In addition to Figure 3 above, the best way to demonstrate the comparatively high wind-speed days experienced by the network from year-to-year is to refer to the histogram shown in Figure 4 below. Figure 4 presents the percentage of days in which high wind speeds at or above 60 km/hr (potentially damaging, gale force levels) have been

[2] Wind Pressure ∝ $(\text{Wind Speed})^2$

experienced, and compares RY14 against the reference period (RY05-RY09), as well as earlier years in the current regulatory period (RY10-RY13).

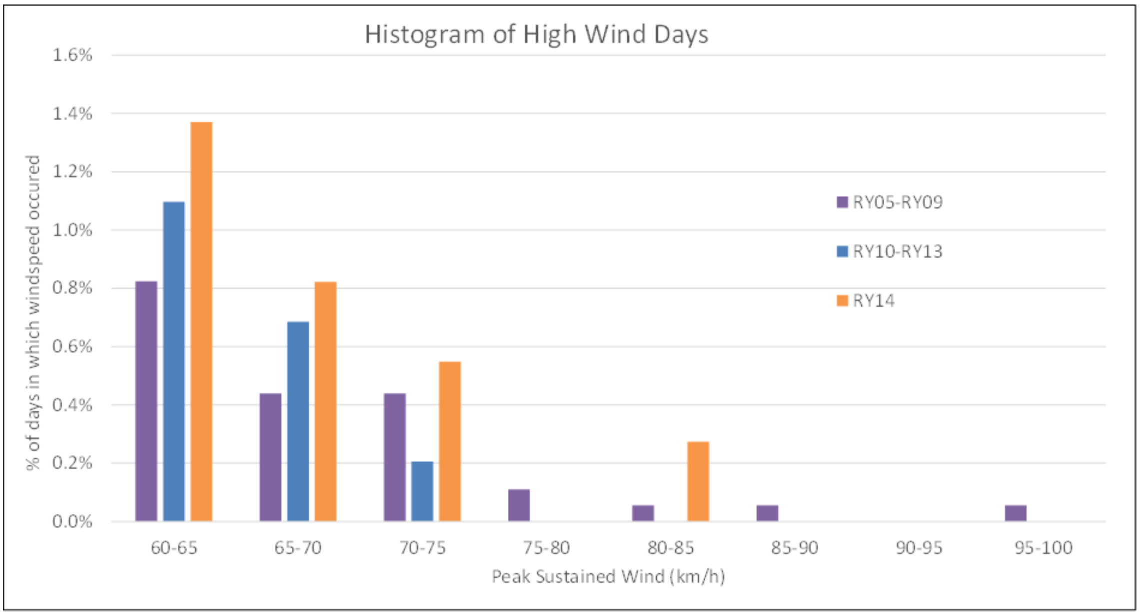


Figure 4 - Percentage of days in which high wind speeds > 60 km/hr (potentially damaging levels) have been experienced

As can be seen in Figure 4, more high wind speed days were experienced in RY14 than average, when compared to the previous regulatory benchmark period of RY05-RY09. However, RY14 did not observe extreme wind speeds beyond 85 km/hr, as was experienced in the previous regulatory period. As the wind speeds observed during RY14 tended towards the lower-end of damaging levels, no Major Event Day SAIDI or SAIFI boundary values were exceeded (due to weather).

As can be seen from Figure 5 below, the result of the larger number of high wind speed days in RY14 shows significantly greater non-MED SAIDI than previous years. This is consistent with the high number of moderately windy days (60-75 km/h) shown in Figure 4; significant SAIDI is incurred but as the wind is not extreme no MED relief is available.

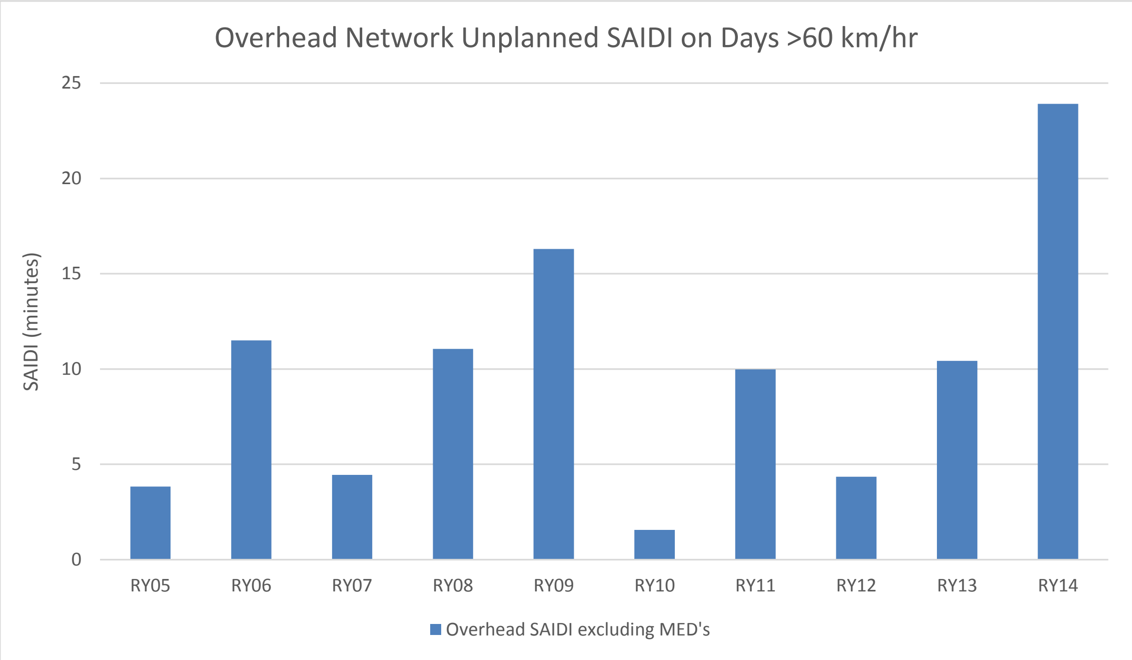


Figure 5 - Non-MED SAIDI on windy days that affected the overhead network.

Underlying Network Integrity

To help investigate whether there is an underlying issue with the integrity of the network that influenced the SAIDI result in RY14, Table 3 was generated to compare the reliability impact of windy days between the reference period and RY14;

	RY05-RY09 (Reference period)			RY14 Performance		
Wind Speed Interval (km/h)	**Count of days**	**Average fault count**	**Average fault SAIDI**	**Count of days**	**Average fault count**	**Average fault SAIDI**
60-65	15	15	2	5	10	1
65-70	8	18	2	3	27	2
70-75	8	27	5	2	31	3
75-80	2	38	10	-	-	-
80-85	1	92	21	1	46	8
85-90	1	126	60	-	-	-
90-95	-	-	-	-	-	-
95-100	1	146	150	-	-	-

Table 3 – Windy-day performance; benchmark period vs RY14

As these higher wind speeds are uncommon there are fewer data points for comparison. However, Table 3 shows that for similar wind speeds, reliability performance in RY14 is comparable to (if not better than) the reference period. The network's resilience to high wind speed events does not show material deterioration.

Material Factors Impacting the Breach of RY14 SAIDI Reliability Limit

It is acknowledged that network reliability is a combination of many factors, the majority of which have not been discussed in this paper. However, Vector believe that the high

SAIDI values seen in RY14 are primarily attributable to a combination of higher than average wind loading induced faults and the single point circuit breaker failure event at Hepburn Rd.

Vector's network is designed to withstand typical wind speeds, however a significant number of the outages associated with wind speed are attributable to vegetation debris hitting the lines. It is acknowledged that effective vegetation management around the overhead assets is key and is something that Vector has a comprehensive programme to manage, pro-actively monitoring 100% of our overhead assets for vegetation issues on an annual basis. However, in high-wind situations, the impact of 'out-of-zone' vegetation from airborne debris becomes more pronounced. 'Out-of-zone' vegetation is that not in the cut-zone of the overhead assets, and therefore not managed through Vector's vegetation management programme. This is something we will continue to monitor and review.

Although designing for a higher wind tolerance (and associated vegetation debris issues) is possible, for example through undergrounding initiatives or installation of insulated conductors, these would incur significant additional cost (and in the latter example potential HSE issues too). Past customer engagement surveys have revealed that the majority of customers are satisfied with current network performance and are not prepared to pay more for improved reliability by designing the network to withstand 'abnormal' events.

From an equipment failure perspective, as discussed in Appendix 7, measures have now been taken to minimise the possibility of future failures on Nissin KOR circuit breakers which was the cause of the Major Event Day in November 2013.

Vector currently has a comprehensive preventative maintenance program. In light of the low consumer appetite for improved reliability (given the associated cost implications) and the fact that network wind resilience has not deteriorated, no material changes to maintenance practices or design standards are currently planned. Ongoing network performance will continue to be monitored closely and remedial action will be taken should statistically meaningful trends be measured around network performance and quality.