Submission on DPP low-cost forecasting approaches

15 August 2014

CONTENTS

Executive Summary

1. Vector appreciates that developing reliable forecasts in the DPP context can be challenging. However, as discussed in the Main Policy Paper submission, in our view the Commission's forecasts of capex, opex and revenue growth are wide of the mark in key areas.

CPI forecasts for revaluation purposes

2. Vector strongly disagrees with the Commission's position that the revenue shortfall suffered by all EDBs in the current regulatory period due to errors in forecasting CPI for revaluation purposes will not be compensated for. The resulting variance between allowable revenues in the current regulatory period and the value of the regulatory asset base means that EDBs will recover significantly less (in Vector's case $57 million less) than is required to achieve NPV over its investments. In our view this is not justifiable.

3. Vector **continues to recommend** a wash-up mechanism for revaluations is introduced, as we put forward previously. Allowing for the wash up is consistent with the regulatory framework for the DPP reset and most consistent with the purpose statement.

4. However, Vector welcomes the Commission's willingness to amend regulatory settings to ensure this situation does not occur again. Vector believes an amendment to information disclosure requirements would be a materially better approach than not making any change at all and we would support such an amendment being made.

Revenue growth forecasts

5. Vector has significant concerns with the Commission's forecasts of both residential and commercial & industrial revenue growth; these issues are at least partly due to a lack of robust data to inform a revenue growth forecast in a DPP context. If the concerns cannot be adequately addressed, Vector believes the best approach would be to use trend analysis of overall revenues for each EDB to forecast total revenue growth over the next regulatory period (adjusted to remove the effect of price resets).

6. In this submission and the accompanying expert reports, Vector sets out evidence demonstrating the increase in residential electricity demand caused by electric vehicles will be outweighed by the impact of energy efficient technologies and distributed generation. Thus the likely impact of new

technology will be that residential demand will continue to decline. Also, GDP growth and moderating price increases are not likely to drive demand growth. Therefore, we **recommend** the Commission reassess its view that energy usage per residential customer is likely to be flat over the next regulatory period. If the Commission does retain this view, we submit that the Commission should find evidence to support that view.

7. The Commission's modelling assumes a 1:1 relationship between population growth and ICP growth. The Commission has argued that the variance between the two is not material. This issue has been reviewed by Castalia who have identified that the impact is more significant than the Commission assumes and that using population growth results in material errors in most New Zealand regions and networks. That is because population statistics do not reflect demographic changes that are closely linked with the actual number of ICPs, for example, changes in household sizes.

8. Household growth rates provide a more conceptually sound basis for forecasting ICP growth that are more accurate that population growth forecasts for most EDBs and Vector **recommends** the Commission uses household growth forecasts for this purpose.

9. The Commission forecasts commercial and industrial growth based on an assumption that a 1% change in GDP will drive a 0.73% change in demand. Vector considers that this assumption is unsound. The Commission's calculated elasticity of lines revenue in relation to regional GDP is 0.73, which is stronger than the elasticity of 0.52 it used in 2012. This appears counter-intuitive, given the decoupling of energy consumption from GDP growth (see Figure 1 below). Further the fit for the model is very poor, as is indicated by the model diagnostics (R^2 and F statistic). We therefore do not believe this relationship between GDP and commercial and industrial revenue growth is credible.

Capex and opex forecasts

10. As discussed in our submission on the Main Policy Paper, the Commission's forecasts of capex and opex deliver insufficient revenues to maintain necessary investment levels on our network. The forecasts have the effect of cutting the capex and opex Vector can spend below the level we believe is prudent and necessary to meet Auckland's growth demands; this will affect the quality of service that is provided to consumers. The Commission should acknowledge the potential impacts and incentives that result when they arbitrarily reassess judgements made by regulated suppliers in this way.

11. Vector does not agree with the Commission's draft decision to use 2013 as the base year for opex. As the Commission has recognised, using up-to-date information is most likely to reflect future expenditure. Vector considers that its forecast 2014 opex as disclosed with our March 2014 AMP Update, is a good reflection of the efficient level of operating expenditure for the next regulatory period.

12. Also, Vector's 2013 opex was depressed by two significant one-off adjustments. Using 2014 as the base year for opex avoids this issue. If 2013 is used as the base year, it should be adjusted to remove the effect of these one-off adjustments. It should also include normalised costs reflected in 2014.

13. Vector does not support the Commission's proposal to apply different capex caps depending on the relative accuracy of the 2010 Asset Management Plan capex forecasts. We consider that all EDBs should be treated equally.

14. The Commission has no information on the reasons why the 2010 AMPs have varied from the values that were forecast. It could be due to forecast error, but similarly could be due to the achieving of efficiency gains. Those with the largest variances are arguably more likely to have achieved the greatest efficiencies, but they are the parties being penalised under the Commission's approach.

15. Vector **recommends** the Commission applies a uniform network capex cap across all EDBs of at least 120%. As a second-best approach, Vector **recommends** the Commission applies the caps based on network capex categories rather than total network capex (as there are some categories EDBs are better at forecasting and have more control over than other capex categories).

Introduction

16. This submission responds to the Commerce Commission's (Commission) consultation paper *Low-Cost Forecasting Approaches For Default Price-Quality Paths* (Forecasting Paper) and the supporting models.

Consultancy Reports

17. Supporting our submission and proposals for the next DPP reset are the following expert reports:
    - Castalia Advisors, *Review of Electricity Default Price-Quality Path Determination 2015: Report to Vector* (Castalia Report).
    - Covec, *Auckland Connections Forecast* (Covec Report).

Revaluations and CPI forecasting

18. The Commission's current position is that it will not wash up for any historical difference between actual and forecast inflation in the 2012-2015 regulatory years.[1] Vector strongly disagrees. The variance between allowable revenues in the current regulatory period and the value of the regulatory asset base means that EDBs will recover significantly less (in Vector's case $57 million less) than is required to achieve NPV over its investments, due to a forecasting error of an item that is outside of the control of EDBs. In our view this is not justifiable. The indication is that the Commission is unwilling to compensate suppliers for errors that materially adversely affect them; thus the precedent value of this decision will cause harm to investor confidence. We do not believe any party accepted or intended that EDBs would bear this risk when the DPP was determined.

19. We do not agree with the Commission's view that, ex ante, an indexed RAB approach to price setting is currently equivalent to an unindexed approach. The ex ante probability (really, a certainty) that CPI will vary from the Commission's forecast means this does not hold. Put simply, the CPI risk EDBs are exposed to under an indexed RAB approach does not exist in an unindexed RAB approach. Therefore, unless one believes that the ex-ante forecasts of CPI are completely accurate – which no right minded person does – then ex ante NPV equivalence does not exist given the manner in which the Commission has implemented its indexed RAB model.

[1] Forecasting Paper, paragraph 2.31.

20. We also note that, in the long-term, consumers should be indifferent to whether regulated asset values are indexed or not, and only an indexed method requires a CPI forecast. We support an adjustment to ensure that financial capital maintenance (FCM) is maintained over time under the indexed method; this will ensure the indexed and unindexed methods deliver NPV equivalent outcomes and consistent incentives to invest.

21. Our strongly preferred solution is that the conceptual disconnect between price setting assumptions and the notional revaluation of RAB as part of the RAB roll forward is acknowledged and corrected in information disclosures now, i.e. before the end of the 2010-2015 regulatory period. This position should then be reflected in the roll forward of RAB to 1 April 2015 for DPP purposes. We propose that this adjustment reflect the difference between the forecast and actual CPI for the period from 1 April 2012 to 31 March 2015, i.e. those periods where EDB revenues were impacted by the DPP.

22. In addition, adjusting for the difference between actual and forecast inflation in this DPP reset is consistent with the regulatory framework. In particular:

    a) When resetting the DPP, the Commission must determine starting prices on the basis of *current* and future profitability, which allows the Commission to adjust for the historical forecasting error in its starting price approach (as part of its current profitability assessment).

    b) Ensuring EDBs are not negatively impacted by forecasting error outsider their control (where the error means they will earn less than NPV=0) is consistent with promoting incentives to invest while at the same time limits an EDB's ability to earn excessive profits.

23. However, Vector welcomes the Commission's willingness to amend regulatory settings to ensure this situation does not occur again. Leaving aside the issue of whether to recover EDBs' losses in the current regulatory period, Vector believes an amendment to information disclosure requirements would be a materially better approach than not making any change and we would support such an amendment being made to correct the conceptual disconnect between price setting assumptions and the notional revaluation of RAB going forward.

24. More broadly, the deferral of cash flows in the indexed RAB approach, relative to the unindexed RAB approach, may expose EDBs to additional risks that

undermine the assumption of NPV equivalence between the two approaches.[2] The view on those risks best sits with the accountable boards of directors of the respective EDBs.

25. If we consider the following propositions:

- RAB can be rolled forward with revaluations at forecast CPI (i.e. arbitrary indexation values in as much as they vary from actual CPI); and

- An indexed RAB approach (at an arbitrary revaluation rate) is conceptually equivalent to an unindexed RAB approach;[3] then

Vector believes that there is scope for a more permissive approach to be adopted. A more permissive approach would allow the profile of the cash flows of the business to better reflect the perception of future cash flow risks held by each EDB board. EDB boards are best placed to assess these risks.

26. Vector therefore **recommends** an approach where each EDB can select the RAB revaluation indexation rates that would be applied in DPP price setting and information disclosures for the succeeding regulatory period. This selection would be certified by the respective boards in advance, committing the business to that profile and ensuring accountability for the choice rested with the directors. The range of options boards could chose might include:

a) The Commission's forecast CPI for RAB revaluation to be applied both in DPP price setting and information disclosure – this could be the default setting; or

b) An alternative forecast indexation rate for RAB revaluation to be applied both in DPP price setting and information disclosure, with the alternative indexation rate for RAB revaluation to be within a predetermined range (e.g. not to be less than zero and not to exceed the Commission's CPI forecast x, say, 1.5);[4] or

[2] Potential future technologies create risk that assets invested in today will be stranded before they reach the end of their lives. This is important because it is only a matter of when, not if, grid parity arrives. By the time there is evidence of consumers systematically substituting away from grid delivered energy, it will be too late to accelerate depreciation of existing assets or recover stranded asset costs because this will only exacerbate the trend.
[3] The approaches are conceptually equivalent if the different exposures to the impact of risks are assumed away.
[4] The factor setting the upper bound of the rage is indicative only. The Commission could set that in the input methodology at the level it considered appropriate following consultation.

c) The Commission's forecast CPI to be applied for RAB revaluation in DPP price setting and actual CPI to be applied for RAB revaluation to information disclosure – i.e. the status quo.[5]

27. Vector considers that this approach would both resolve the issue where FCM is not achieved where forecast CPI varies from actuals and puts responsibility where it should lie – with the businesses – to determine the weight they place on the risk of future asset stranding due to technology change (and regulatory change). This is appropriate as the uptake of new technologies leading to asset stranding is likely to vary between networks.

Forecasting Revenue Growth

General comments

28. Vector agrees with the Commission that the revenue growth forecast can have a more material impact on the starting price that is set than other forecasts.[6] The revenue growth forecasts determine the slope of the forecast revenue line and thereby determine the starting point. Once determined there is little EDBs can do to influence the actual revenue path – that is driven by actual growth and actual CPI. To the extent that the forecast cost stack is unchanged by these factors, then EDBs are exposed to under (or over) performance/recovery relative to the regulatory ROI. This means the Commission should take extra care to ensure the revenue growth forecasts it develops are robust and are based on a careful assessment of all available evidence. Vector is concerned that the Commission's draft decision on revenue forecasting falls short of this standard.

29. It is also notable that the Commission is using essentially the same approach to forecasting revenue growth as it used in the 2012 DPP final decision and is not proposing to review it despite that model producing materially incorrect results for a number of EDBs, including Vector.

30. As discussed in the Castalia report and below, there are significant issues with the Commission's forecasts of both residential and commercial & industrial revenue growth. The Commission's revenue growth forecasts for Vector are materially divergent from our own internal forecasts. Our forecasts are supported by evidence external advice that we discuss below

[5] This option is included to cater for EDBs that consider real FCM is only achieved if RAB is rolled forward at actual CPI and view that as an overriding consideration.
[6] Forecasting Paper, paragraph 5.4.

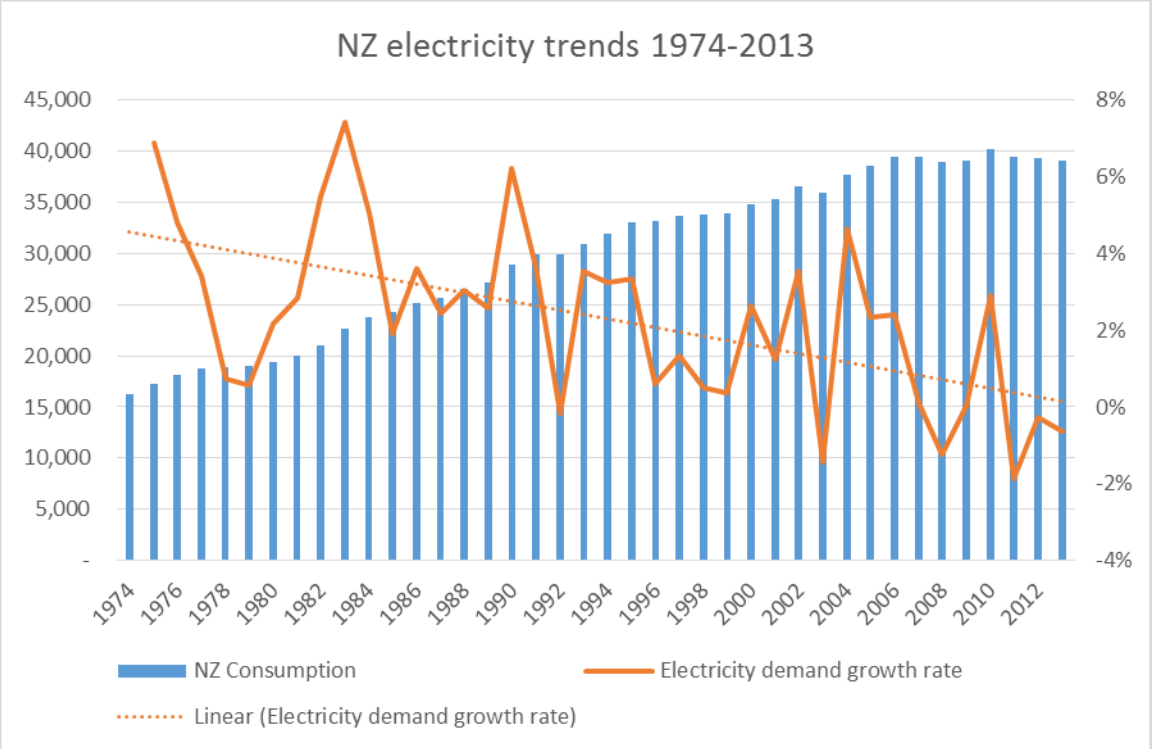
and which is appended to this submission. We believe it would be helpful for the Commission to review this evidence and use it to better inform its own forecasts. We make recommendations below in this regard. However, if the Commission's forecasts cannot be materially improved, Vector **recommends** the Commission develop forecasts based on historical trends in revenue growth for each EDB (adjusted for the effects of regulatory price changes).

Residential revenue growth

Change in electricity use per residential consumer – response to Commission's analysis

31. Vector and other EDBs have provided evidence to the Commission that electricity usage per customer has steadily declined over most of the past decade. The Commission has not accepted that these historical trends are a relevant indicator of future trends over the next regulatory period and has requested evidence on likely future trends instead. Vector notes that consumption growth rates have been declining for most of the past 40 years, although they have only more recently led to actual declines in consumption, as shown in Figure 1.

Figure 1: NZ electricity consumption and demand trends 1974-2013



32. Vector has engaged Castalia to source evidence regarding future trends in usage per customer over the next regulatory period. The Castalia report is attached and its key findings are discussed below.

33. However, Vector takes issue with statements made within paragraphs 5.19 and 5.20 and, given the materiality and the implications for the Commission's practice in making decisions, we consider it is important to set out our concerns. The Commission said:[7]

> *However, our current view is that electricity consumption by the average residential user is unlikely to fall over the next 5-7 years. Electricity price increases are starting to moderate, economic activity is picking up, and electric cars are becoming viable.*
>
> *We therefore invite evidence on the likely pattern of future trends, rather than historical analysis*

34. Vector makes the following points in response:

a) It would have been helpful if the Commission could have indicated its preference for evidence on future trends at an earlier stage – for example, we could have sourced this information at the time of the Issues Paper consultation rather than providing information based on historical trends. It was not self-evident that the Commission would view historical trends as not being indicative of future trends. The Commission itself has developed forecasts based on historical trends for many other items in the draft decision.[8]

b) We consider that historical trends are a useful indicator of future trends because there are seldom step changes in the way energy is used and therefore future trends are already embodied in historical trends (for example, not all consumers install LEDs or by electric vehicles on the day they become available and cost effective, their uptake is progressive). As the Commission has based so many other DPP forecasts on historical information it would appear the Commission agrees with this view.

c) As discussed by Castalia (see below) the views that "electricity price increases are starting to moderate" and that "economic activity is picking

[7] Forecasting Paper, paragraphs 5.19-5.20.

[8] The Commission has used historical trends in developing many inputs to the DPP, including: network capex, non-network capex, commercial and industrial revenue growth, opex rate of change, line length, disposals, other regulated income, SAIDI target, SAIFI target, productivity analysis conducted by Economic Insights, GXP offtake data (for GDP growth forecasts), etc. It is not clear to Vector why usage per ICP is materially different from <u>all</u> of these other items. We would be interested to further understand the Commission's reasoning.

up" are not clearly relevant or suggestive of flat or increasing energy usage by residential consumers.

d) Vector agrees that "electric vehicles are becoming viable" and they will increase demand for those consumers that have them. However, the Commission has highlighted the only major technology trend that is likely to increase demand and seems to have ignored any technology trends that may reduce demand (evidence gathered by Castalia and Vector indicates that demand reduction due to LED lightbulbs, solar photovoltaic (PV), efficient appliances, etc. will swamp any demand increase due to electric vehicles). Vector is somewhat concerned that the Commission appears to be picking individual items to focus on rather than taking a robust and balanced view of the overall trends, often already reflected in historical data.

e) More broadly, as noted above, revenue growth is a key input to the DPP model. Decisions made on the revenue growth forecasts should therefore be based on rigorous analysis. On the face of it the Commission's analysis in paragraph 5.19 does not appear to have been based on anything more than high-level assumptions (e.g. the Commission does not appear to have considered the relative impact of growth in electric vehicles compared to other technologies that will reduce demand or tried to quantify the impact of price changes or economic activity or electric vehicle penetration rates). Vector does not believe this is an optimal approach. The Commission should aim to develop high-quality forecasts and should put effort into ensuring that its decisions are based on full and robust analysis.

35. Also, as discussed in detail in our submission on the Main Policy Paper, Economic Insights' view that future demand is likely to increase is based on Australia-specific forecasts that already look too high and incorporate transmission customers. This would therefore not be a relevant input into revenue growth forecasting for New Zealand EDBs.

<u>Change in usage per ICP – evidence of a declining trend</u>

36. In this section Vector discusses the expected trends in usage per ICP, including the impact of new technologies on volumes, over the next regulatory period, using information sourced by Castalia, reported by MBIE and gathered by Vector for our internal planning purposes.

37. Firstly, the recently published edition (2013 calendar year) of the MBIE report *Energy in New Zealand* stated that:

> "Electricity consumption decreased by 0.6% to 38,998 GWh in 2013 from 39,245 GWh in 2012. Residential consumption decreased by 1.7% to 12,307 GWh. This is the third year in a row residential demand has fallen... As New Zealand's population has continued to grow over the last three years, New Zealand's residential electricity use per capita has fallen. Technological energy efficiency improvements and changes in household behaviour could be behind this fall."[9]

38. While this is clearly historical information, as noted above we consider that historical trend information is relevant to this decision and this is further evidence that the trend is continuing. Importantly, this trend continued through 2013 even though, to quote the Commission, during 2013 it is at least arguable that "electricity price increases [were] starting to moderate, economic activity [was] picking up, and electric cars [were] becoming viable". The Commission should therefore take this into account.

39. Castalia's review of the evidence for future trends found that the Commission's assumption that consumption per ICP will level off is not on solid ground.[10] Castalia addresses the three factors highlighted by the Commission as reasons for assuming that recent declines in electricity usage per ICP will not continue: 1) increasing economic activity, 2) moderation of electricity price increases, and 3) the viability of electric cars. Vector also has information that is relevant to this analysis.

40. **Decoupling of economic growth from electricity consumption:** Castalia finds that the declining relationship between economic growth and electricity consumption means that growth may not lead to increases in demand.[11] Residential electricity consumption in New Zealand has decoupled from GDP over the last decade, as starkly reflected in Figure 2. This trend demonstrates that changes in economic activity are not a strong indicator of changes in energy consumption.

> Figure 2: Growth in real GDP and residential electricity consumption, 2004-2012

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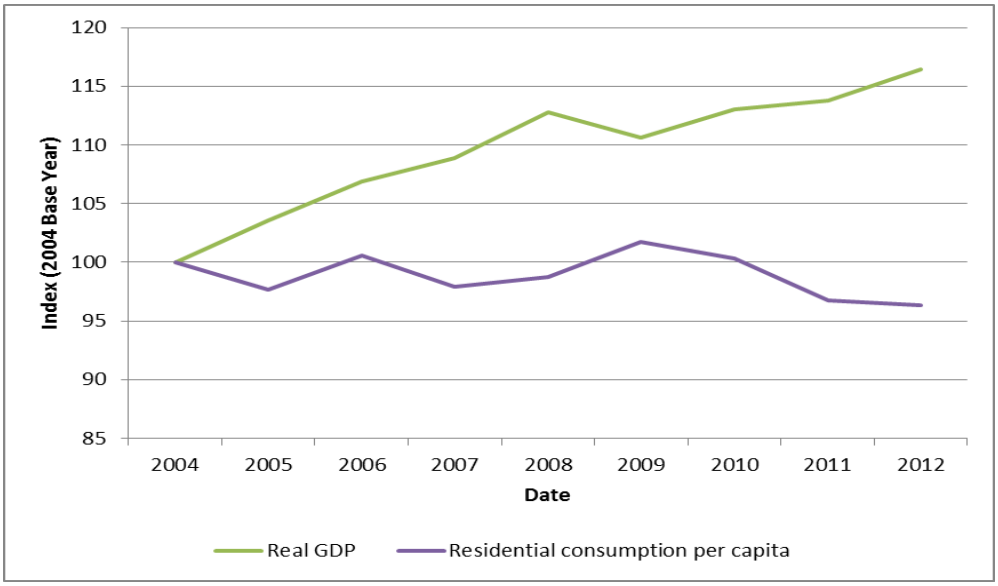
[9] Pages 55-56 of: http://www.med.govt.nz/sectors-industries/energy/energy-modelling/publications/energy-in-new-zealand/Energy-in-New-Zealand-2014.pdf
[10] Castalia Report, section 3.
[11] Castalia Report, pages 10-11.



Source: Castalia Report

41. **Moderation of electricity price increases:** Castalia finds that even if price increases were to moderate (influenced by such factors as lower demand growth and technology improvements such as PV), the price elasticity of electricity in New Zealand has been estimated by the Electricity Authority to be -0.26.[12] This implies that as long as prices continue to increase, even at lower rates, demand will continue to decline, albeit slowly. Even if prices decreased the increased demand would also occur at a low rate.

42. **Increased demand due to electric vehicles will be offset by reduced demand driven by other technology trends:** Castalia finds that mass market penetration is a long-term proposition for electric vehicles in New Zealand. While EVs will significantly increase consumption for those households that own them, the uptake of EVs in NZ is likely to be slow prior to 2020. As Castalia finds, vehicles in New Zealand are infrequently replaced and most cars purchased are second-hand imports. EVs will therefore take time to penetrate in significant numbers.[13]

43. In addition to the findings of Castalia we note that the April 2013 IEA report *Global EV Outlook – Understanding the Electric Vehicle Landscape to 2020*[14] indicates a potential target of 2% of vehicles in the 17 member countries of the "Electric Vehicle Initiative" (EVI) by 2020. Most EVI member countries provide financial and/or non-financial incentives for purchases of electric vehicles. New Zealand is not a member of the EVI and does not provide

[12] Castalia Report, pages 11-12.
[13] Castalia Report, pages 13-15.
[14] http://www.iea.org/publications/freepublications/publication/global-ev-outlook.html

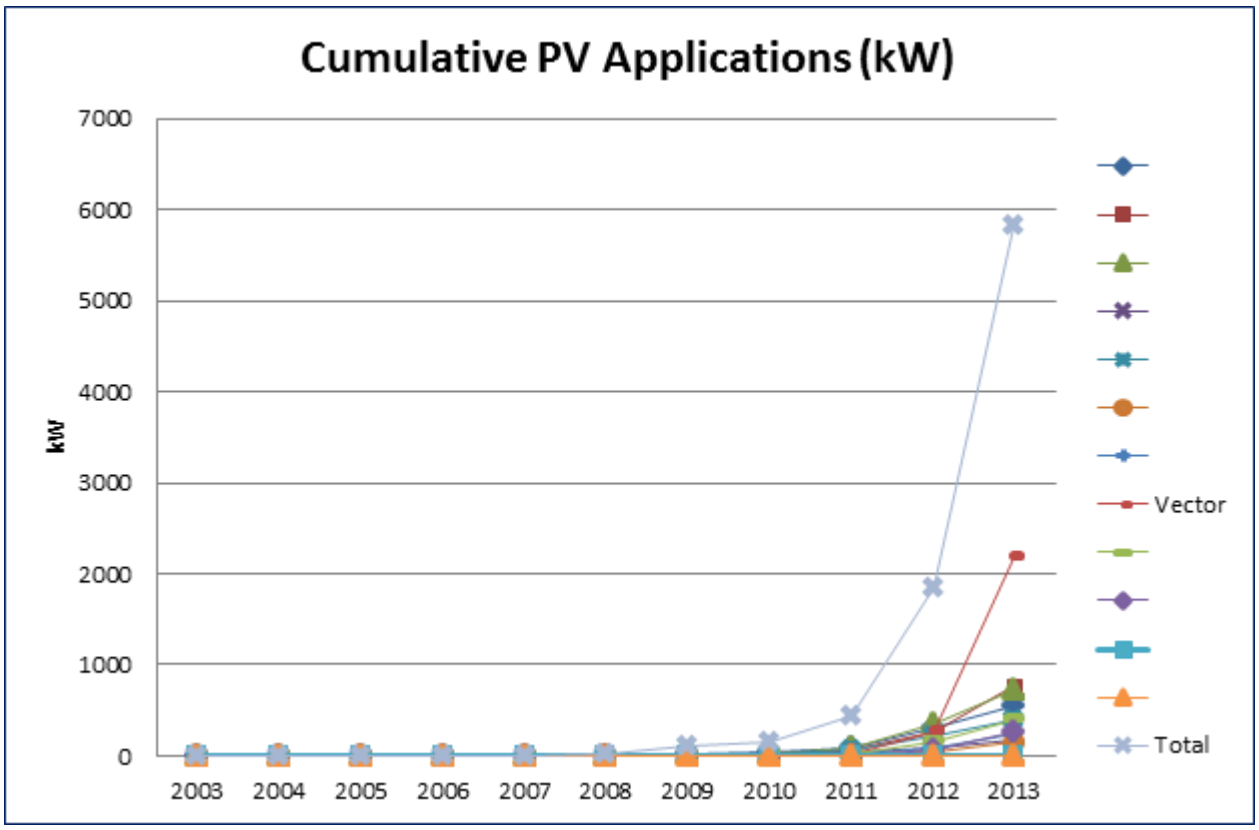
financial or non-financial incentives so the 2% target is unlikely to be met here. Even if 2% of cars in New Zealand were electric vehicles, this would equate to only around 50,000 electric vehicles.[15] This suggests the optimistic scenario identified by Castalia of 70,000 electric vehicles in New Zealand by 2020 is unlikely to occur.

44. Castalia find that even these overly optimistic projections of the number of EVs in New Zealand would be insufficient to offset the impact of reductions in energy usage due to the uptake of energy efficient appliances.[16] Additionally the continued uptake of solar PV and LED lights will further depress demand. We are seeing continued reductions in the price of LED lighting and, as Castalia notes, LED lights themselves are expected to become even more energy efficient.[17]

45. Vector's disclosure data demonstrates (or will demonstrate once our 2014 information disclosures are published) that connection rates of distributed generation on our network have increased by more than 450% between 2013 and 2014.[18] Based on the number of applications received so far in the 2015 regulatory year, we expect this trend to continue. We also note that this is consistent with research provided to Vector by the University of Canterbury, as in figure 3 below.

[15] There are currently approximately 2.5 million cars in New Zealand: http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11246464
[16] Castalia Report, page 14.
[17] Castalia Report, page 13.
[18] Vector Limited, Electricity Information Disclosures 2013 and 2014, Schedule 9e. The number of new DG connections has increased from less than 100 in 2013 to more than 500 in 2014. The vast majority of these are solar PV installations.

Figure 3: Solar photovoltaic applications by network



Source: Canterbury University

46. Based on this evidence, an assumption that New Zealand as a whole will see 6000 solar PV installations per year over the next regulatory period is a conservative assumption (as it assumes very little growth from 2013 levels). If the average system size is 2.5kWh, then by our calculations the volume of energy produced by PV installations will be in the region of 100 GWh by 2020. This is a significant reduction in energy demand.

47. These trends of declining demand are also seen overseas. For example, in the United States retail electricity sales have not yet recovered to their 2008 peak despite the population increasing by more than 12 million people in that time and at least a partial economic recovery. Energy efficient appliances and solar panels were among the explanations put forward for this trend.[19]

48. In conclusion, the available evidence suggests the impact of electric vehicles on residential electricity demand will be outweighed by the impact of energy efficient technologies and distributed generation. Thus the likely impact of

[19] http://online.wsj.com/articles/electric-utilities-get-no-jolt-from-gadgets-improving-economy-1406593548

new technology will be that residential demand will continue to decline. Also, GDP growth and moderating price increases are not likely to drive increases in demand.

49. In contrast the Commission's position lacks evidential support. Thus we **recommend** the Commission reassess its view that energy usage per residential customer is likely to be flat over the next regulatory period.

50. Vector further **recommends** the Commission adopts Castalia's forecasts of residential consumption growth forecasts for each EDB (set out in Table 3.3 of the Castalia Report) as inputs into its DPP model, to replace the current assumption of a 0% change in usage per customer.

Relationship between population growth and ICP growth

51. The Commission's modelling assumes a 1:1 relationship between population growth and ICP growth. The Commission has argued that the variance between the two is not material. This issue has been reviewed by Castalia who have identified that the impact is more significant than the Commission assumes. Their findings are:[20]

a) Population growth does not provide an accurate basis for forecasting ICPs. Using the Commission's approach based on population growth leads to a forecast that Vector earns revenues from approximately 4,000 customers that do not exist.

b) Using population growth results in material errors in most New Zealand regions and networks. That is because population statistics do not reflect demographic changes that are most closely linked with the actual number of ICPs, for example, increasing household sizes suggests the number of ICPs would increase at a slower rate than population growth.

c) The Commission's draft determination noted there was little difference between population growth and household growth for Wellington and Auckland between 2006 and 2013. Castalia's assessment shows that this view was based on a mis-apprehension of the data. Where the data is framed in terms of demand forecast error, the difference is significant (greater than 10% for Vector).

[20] Castalia Report, pages 7-8 and 14-15.

d) Household growth rates provide a more conceptually sound basis for forecasting ICP growth that are more accurate than population growth forecasts for most EDBs.

52. Vector agrees with Castalia that household growth forecasts by Statistics New Zealand are a better proxy for forecasting ICP growth than population growth forecasts. Vector **recommends** the Commission uses household growth forecasts for this purpose. We acknowledge that in some cases the household growth forecasts are also inaccurate; however they are generally less inaccurate than population growth forecasts.

53. We also note that the data quoted by the Commission in the Forecasting Paper indicates a trend of increasing household size. Table 5.1 of the paper provides both household and population numbers for 2006 and 2013. For Auckland they indicate a population that grew by 110,592 over that time, while households grew by 33,432. This implies the average size of the new households is 3.3 persons, significantly higher than the average of 2.98 persons in 2006. A similar trend can be seen for Wellington.

Commission's population growth forecasts are too high

54. If, despite our recommendation above, the Commission did use regional population growth forecasts to project ICP growth, we note it would rely on Statistics New Zealand information that does not take account of updated census data (as it is not yet available at the necessary disaggregation). However, the higher level data released by the census has demonstrated that the Stats NZ forecasts relied on by the Commission are too high. In late 2013, Vector commissioned Covec to develop forecasts of population growth based on the new census data to inform Vector's AMP and budget planning.

55. Covec has prepared the report attached with this submission using the forecasts it developed for Vector's AMP. Based on the Covec Report, we make the following observations regarding the population forecasts being relied on by the Commission:[21]

a) The most recent regional population projections available to the Commission are the Statistics New Zealand October 2012 projections. These were based on the 2006 census data. Statistics New Zealand is not expected to produce new regional projections based on 2013 census data until early 2015, too late for the DPP final decision.

[21] Covec Report, pages 1-3.

b) However, Statistics New Zealand has released some initial population counts from the 2013 census, including the "usually resident" population. Covec advises that "This measure of population differs from the June population used in the population projections, but the growth rate of the usually resident population is expected to be similar to that of the June population estimate."

c) For the Auckland region, Covec's analysis of the usually resident population counts indicates that the Auckland population grew at a compound annual rate of 1.2% between 2006 and 2013, lower than the predictions made by Statistics New Zealand in 2012 and relied on by the Commission. Covec's forecast of population growth rates for Vector are therefore 0.2% per annum lower than the 2012 (and now out-of-date) forecasts by Statistics New Zealand.

56. Vector submits that the above analysis should demonstrate the risks associated with using the October 2012 population projections by Statistics New Zealand. Vector recommends the Commission adjusts the 2012 projections for each EDB in the same way Covec has for Vector – by using the already available counts of "usually resident population" (the Covec report provides a link to this dataset). In our view, this adjustment is likely to make the Commission's forecast more reliable.

Commercial and industrial revenue growth forecasts

57. The Commission forecasts commercial and industrial growth based on an assumption that a 1% change in GDP will drive a 0.73% change in demand. Vector considers that this assumption is unsound.

58. Castalia has found that the Commission's assumption that the relationship between GDP growth and commercial and industrial demand has increased since the previous price reset is not supported by the available evidence.[22]

59. The Commission's calculated elasticity of lines revenue in relation to regional GDP is 0.73, which is stronger than the elasticity of 0.52 it used in 2012. This appears counter-intuitive, given the decoupling of energy consumption from GDP growth discussed above (also see Figure 2). The draft DPP determination does not discuss any possible reasons for the increase in elasticity and we are not aware of any credible explanation for it.

[22] Castalia Report, section 2.

60. Further the fit for the model is very poor, as is indicated by the model diagnostics (R^2 and F statistic).

61. Castalia also found that:

a) Using line revenue as the dependent variable introduces circularity. Because prices are regulated, they cannot fully vary with the economic conditions. Applying this relationship to forecasts of future changes in economic conditions will not provide objective forecasts of future revenues.

b) The relationship may not apply to Vector. The Commission's decision to exclude Vector and OtagoNet from its analysis suggests that the statistical relationship may not hold for these EDBs (which accounted for around 33 percent of ICPs or 35 percent of overall lines revenue in 2013). Vector agrees with Castalia that the Commission should place limited weight on the relationship when a third of ICPs or revenue are excluded from the analysis.

62. As noted above, if the Commission cannot develop robust forecasts of commercial and industrial revenue growth, it should consider the option of setting total revenue forecasts based on the historic trend series.

Delta D wash-up

63. As discussed above, we believe the Commission's forecast of revenue growth is too high across a range of inputs. This will mean the calculated MAR is too low, but will also affect the conversion of MAR into notional revenue terms by way of the ΔD adjustment. This means the too-high forecast will have an additional impact.

64. Vector's forecast of revenue growth over the 2015 and 2016 years is 0.78% per year, compared to the Commission's forecast of 1.80% per year. If the Commission does not change its forecasts, but Vector's forecasts turn out to be correct, this will mean (among other impacts) that, because ΔD is too high, Vector's 2016 allowable notional revenue will be approximately $11 million below what is necessary to recover Vector's MAR. This will be a material impact based on an item over which EDBs have limited to zero influence.

65. Vector **recommends** the introduction of a wash-up term to adjust for variance between the expected and actual ΔD value. Without such a wash-

up, EDBs will not expect to recover their MAR in the first year of the regulatory period (or any year thereafter), with commensurate impact on their incentives to invest.

66. We note that the Commission has proposed a capex wash-up in which any variance between forecast and actual capex in the final year of the base year is washed-up in a regulatory period to ensure the opening RAB of the regulatory period reflects the actual RAB. We believe the same principle should be applied to revenue growth (and even opex) to ensure the opening revenues and costs of an EDB are correctly reflected in the DPP model.

Implications of forecasting EDB expenditures at less than their forecasts

67. As discussed in our submission on the Main Policy Paper, the Commission's forecasts of capex and opex deliver insufficient revenues to maintain necessary investment levels on our network. The forecasts have the effect of cutting the capex and opex Vector can spend below the level we believe is prudent and necessary to meet Auckland's growth demands; this will affect the quality of service that is provided to consumers.

68. The Commission should acknowledge the potential impacts and incentives that result when they arbitrarily reassess judgements made by regulated suppliers in this way. The Commission should also not impose penalties on the affected EDBs for poor SAIDI and SAIFI performance that results from the reductions in expenditure.

69. We also note that Vector's expenditures have been efficient. Our lower-than-forecast capex reflects capital spend efficiencies we have been able to achieve since 2010. Our opex is consistently among the lowest per customer and per energy delivered and independent external reviews of our policies, practices and network health have confirmed our expenditure plans are efficient.

Forecasting opex

Initial level of opex

70. Vector does not agree with the Commission's draft decision to use 2013 as the base year for opex. As the Commission has recognised, using up-to-date information is most likely to reflect future expenditure. Vector considers that its 2014 opex, as forecast in our March 2014 AMP Update, is a good reflection

of the efficient level of operating expenditure for the next regulatory period. In our view the Commission should either rely on the 2014 expenditure data provided or normalise the 2013 to establish a typical level of expenditure.

71. The variances between Vector's 2013 and 2014 opex fall into two categories; these are discussed below:

a) One-off transactions that depressed 2013 opex. Thus, if 2013 is used as the base year, it should at least be normalised to remove the effect of these transactions. There are two significant transactions in this category.
b) Changes in expenditure that mean 2014 opex is a better reflection of future opex for Vector than 2013 opex.

One-off transactions that depressed 2013 opex

72. In 2013 Vector released an accrual that was no longer deemed necessary. The effect of releasing the accrual was to depress Vector's 2013 opex by $3 million.

73. In 2013 Vector released a doubtful debts provision of $2 million. This has the result of depressing Vector's recognised debt (i.e. doubtful debts + bad debts) by $2 million.

74. These were one-off adjustments. Using 2014 as the base year for opex means these adjustments do not affect base year opex. If 2013 is used as the base year, it should be adjusted to remove the effect of these one-off adjustments.

Ongoing changes in expenditure

75. Other key variances in opex between 2013 and 2014 are expected to continue and thus should be reflected in base year opex for the next reset. These are discussed in the table below.

Item	**Change from 2013**	**Discussion**
Contracting services related party charges	+$8 million	This difference in opex between 2013 and 2014 reflects the application of the rules in clause 2.3.6(1)(b) of the Electricity Information Disclosure Determination 2012. The Commission has confirmed in correspondence

Item	Change from 2013	Discussion
		with Vector that the information disclosure rules permit related party transactions for contracting services to be valued at cost plus a mark-up. It is clear from disclosures made in 2013 that some EDBs have applied the related party valuation option 2.3.6(1)(b). In our view, their ability to apply this valuation technique is based on the fact they already had a structure in place where a related party provided contracting services to the regulated EDB. We do not believe other EDBs like Vector should be penalised simply because they did not have this structure in place before 2013. Vector included the impact of adding a margin to the contracting services element of our business in the March 2014 AMP Update disclosures on the basis that we intended to implement the necessary arrangements. That process has been delayed and hence these costs are not reflected in Vector's actual 2014 opex disclosure. However, we are completing the process so the new arrangements will be in place by 1 April 2015 and therefore will form part of our cost structure over the regulatory period.
Corrective maintenance	+$5 million	The increase in expenditure is a result of improved effectiveness in fault detection. Improved technology has allowed us to automate some of our fault detection methodologies. This has identified maintenance conditions that were previously difficult to detect and which would have been addressed following asset failure. These changes mean we are able to more proactively identify and rectify faults on the network (for many of these, network standards require them to be rectified quickly). This has led to a higher spend on corrective maintenance and we expect that increased expenditure will continue over the regulatory period. This higher level of expenditure should over time reduce the

Item	Change from 2013	Discussion
		level of reactive maintenance that is required, but this will take some time to flow through.
Payments to Vector Communications	+$2.5 million	The cost of communication services provided by Vector Communications Limited were adjusted to reflect market rates and the provision of new services. A key input to determining market based pricing for dark fibre services was the establishment of the Government's Ultrafast Broadband (UFB) initiative. With the introduction of Chorus' regulated dark fibre product Vector has been able to build a comparable wholesale product. An explanation of the basis for setting prices for services provided by Vector Communications to the electricity distribution business will be provided to the Commission separately and on a confidential basis.

Audit and certification of opex variances

76. Vector notes the Commission's preference in paragraph 9.20 of the Main Policy Paper that any data provided to the Commission in this process should be supported by audit and certification. Vector is considering what information above could be usefully supported by audit and certification and by independent engineer's reports, but is mindful of the costs involved in developing evidence to that standard.

77. If the Commission reaches a view that it would accept the information above if it had additional audit or certification then we would be happy to provide such and could do so at relatively short notice. However, at this stage it is not clear that such audit or certification is required by or would be influential for the Commission. Vector **requests** the Commission advises whether further audit or certification is required as soon as practicable.

Opex partial productivity factor

78. This is discussed in the productivity analysis section of our submission on the "Main Policy Paper". In that submission we support the ENA's

recommendation of an opex partial productivity factor of -2. We also suggest, as a second best option, a value in the range -1 to -1.5 (as the average of the findings of Economic Insights and PEG). We refer the Commission to that discussion.

Forecasting capex

110% and 120% cap on supplier forecasts of network capex

79. Vector does not support the Commission's proposal to apply different capex caps depending on the relative accuracy of the 2010 Asset Management Plan capex forecasts. We consider that all EDBs should be treated equally.

80. The Commission has no information on the reasons why the 2010 AMPs have varied from the values that were forecast. It could be due to forecast error, but similarly could be due to the achieving of efficiency gains. Those with the largest variances are arguably more likely to have achieved the greatest efficiencies, but they are the parties being penalised under the Commission's approach. The Commission argues, paradoxically, that by penalising suppliers that may have achieved efficiencies in the previous period creates a strong incentive for suppliers to achieve capex efficiencies in the coming regulatory period.[23]

81. By applying different treatments to different EDBs, in our view the Commission is effectively applying claw-back to certain EDBs. We do not believe this is justified. Castalia notes that the Commission's proposed approach is at odds with a key principle of any CPI-X regime – that price controls are set on a forward-looking basis only and firms are not punished ex post for spending less than the regulator forecast.[24]

82. Further, as Castalia notes, the Commission is now signalling to regulated suppliers that they need to pay attention to the differences between forecast and actual expenditure, rather than just focus on minimising costs.[25] This may lead to less cost reduction in future.

83. The Commission should also recognise that some parts of the capex forecast in the AMP are more difficult to forecast than others. Some expenditure is variable and beyond the full control of the EDB, especially with regard to the

[23] Low Cost Forecasting Paper, footnote 27.
[24] Castalia report, page 17.
[25] Castalia report, page 18.

ultimate timing of the expenditure. With uncertainties as to the impact of the Global Financial Crisis, forecasting the volume of growth activity in 2009 for the subsequent five year period was indisputably challenging. Similarly, activities such as relocations and other developments may depend on major works such as the UFB project or roading and rail developments. The timing of these activities often move across a number of years at the discretion of other parties (developers, NZTA, etc.). For Vector, for example, our forecasts diverged furthest from forecasts with regard to those categories over which we had the least control (e.g. customer connections, relocations). Meanwhile our forecasts on items most within our control (e.g. asset replacement and renewal) have been very accurate.

84. The Commission should also be mindful of the effects of its decisions to reduce capex. The primary focus of EDBs will be on ensuring health and safety. They will then focus on maintaining existing assets. Growth capex is the most likely to be cut by EDBs that find themselves with insufficient revenues to meet their expenditure needs. They may also increase the level of contributions they require from consumers. Consumers may not welcome such decisions.

85. Vector **recommends** the Commission adopts the EDB capex forecasts or, in the alternative, applies a uniform network capex cap across all EDBs of at least 120%.

86. As a second-best approach, Vector **recommends** the Commission applies the caps based on network capex categories rather than total network capex. As noted above, forecasts for categories such as asset replacement and renewal have been very accurate but forecasts with regard to those categories over which we had the least control (e.g. customer connections, relocations) are inherently more variable.

87. Thus our alternative proposal is for the differential caps to be applied at a category level based on the variance between each of the 2010 category forecasts and actual expenditure in each category since. This would apply a higher cap to those items EDBs are apparently better at forecasting and a lower cap to those they appear to be less good at forecasting. We believe this is more likely to reflect EDB forecasting accuracy than the Commission's proposal in the draft decision. However, differential caps should only be applied where the Commission has evidence that the variance are not the result of efficiencies.

Non-network capex

88. Vector believes that, as a matter of principle, it would be preferable to apply the same cap (i.e. 200%) across all EDBs, rather than reducing the cap for some. We note that the Commission's forecast of Vector's non-network capex remains unchanged irrespective of whether a 200% or a 173% cap is applied so this approach would not affect Vector's non-network capex allowance.

Supplier forecasts of network capex

89. As previously signalled informally to Commission staff, Vector cannot reconcile the data the Commission claims to be Vector's capex forecast with our own disclosures. Specifically cells Q26 – Q31 of *Model 4 capex projections* do not match the numbers in schedule 11a that was disclosed with Vector's 2014 AMP Update. We understand the Commission will resolve this data issue.

Menu regulation

90. A report by Frontier Economics for the ENA Forecasting Working Group recommended the introduction of menu regulation as a means of enabling the regulator to place greater reliance on regulated suppliers' forecasts. The Commission, correctly in our view, considers that the complexity of menu regulation as recommended by Frontier makes it infeasible to implement for this reset.

91. Castalia have set out in brief form in their report (pages 18-19) how a simplified form of menu regulation may work. In our view this has some merit and may be more suitable for a DPP than the more complex version put forward by Frontier. However, given timeframes, Vector's view is that there is probably insufficient time for even this simplified approach to be implemented for the 2015 reset. That said, it is still worth considering.

Forecasting disposals and other regulated income

92. Vector agrees with the Commission's proposed approaches to forecasting disposals and other regulated income.