29 August 2014

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Dear John McLaren

Cross submission on DPP Draft Decision and Low cost forecasting approaches

1. Introduction

Wellington Electricity Lines Limited (**WELL**) welcomes the opportunity to make a cross submission in response to submissions made on 15 August 2014 by other stakeholders on the Commerce Commission's (**Commission**) consultation paper on the Default Price-Quality Path (**DPP**) Draft Decision and associated paper on Low cost forecasting approaches.

WELL's submission responds to Vector's suggestions on potential improvements to the Commission's Constant Price Revenue Growth (**CPRG**) model.

2. Vector's submission

In its submission, Vector recommended that unless the Commission can make material improvements to its CPRG model, then a historical average approach should be applied to forecast CPRG.[1]

Vector suggests two ways the Commission could attempt to improve its CPRG model, these include:

- Using StatsNZ household growth forecasts in place of StatsNZ population growth forecasts as a proxy for forecast growth in residential connections as recommended by its consultant's Castalia.
- Replacing the Commission estimate of zero growth per residential user with the estimates of residential electricity consumption growth prepared by Castalia's Table 3.3.

This submission assesses whether each of the above suggestions would materially improve the Commission's CPRG model and finds that they would not.

Consequently, WELL supports the conclusion that the Commission's current CPRG model cannot be materially improved and therefore a historical average growth rate should be applied to forecast CPRG for the 2015-20 DPP. WELL's submission on 15 August 2014, provides a readily available method for the Commission to calculate historical CPRG using information on EDBs actual growth in consumption and connections over the 2010 to 2014 period.

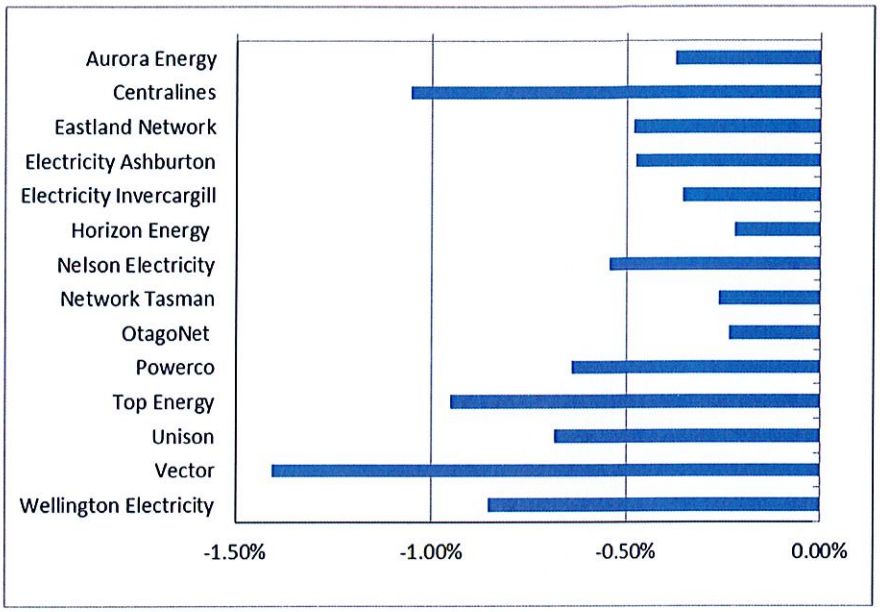
Section 3 of this submission sets out WELL's proposed method and explains that the method can easily be adapted to accommodate the tariff structures of EDBs that are not compatible with residential, commercial and industrial customer groupings.

[1] Vector, *'Submission on DPP low-cost forecasting approaches'*, 15 August 2014, page 10.

2.1. Household growth as proxy for residential ICP growth

Figure 1 shows the difference between annual average actual residential ICP growth and annual average household growth for 14 of the Electricity Distribution Business (**EDB**) subject to DPP regulation. Figure 1 demonstrates that household growth has been significantly higher than actual residential ICP growth for all 14 EDBs over the current period. Consequently, if the Commission were to use household growth forecasts to estimate ICP growth forecasts material errors would still be expected.

Figure 1 Difference between actual residential ICP growth and household growth (annual average)[2]



NB: A negative value means that residential ICP growth was less than household growth.

2.2. Castalia residential consumption forecasts

Upon a literal reading of Vector's submission, the recommendation is that the Commission replaces its forecast of zero growth per residential user with Castalia's estimates of total residential consumption growth for each EDB in Table 3.3. There are two sets of estimates in Castalia's Table 3.3, one estimate based on consumption per household and the other based on consumption per residential ICP.

WELL notes that directly applying the estimates in Table 3.3 would be problematic as they relate to total electricity consumption rather than consumption per household or per residential ICP. Therefore including these directly in place of zero growth in the Commission's current CPRG would result in double counting of the contribution to total residential revenue growth from the growth in the number of households. Consequently the model would systematically over-forecast residential sector constant price revenue growth.

WELL understands however that Vector's intention was to recommend that the Commission either:

- Replace the Commission's forecast of zero growth per residential ICP with Castalia's estimates of New Zealand (**NZ**) residential consumption growth per household to all EDBs (which can be derived from Castalia's Table 3.2); or

[2] Annual average household growth for period 2011 to 2016, data sourced from Castalia, *'Review of Electricity Default Price-Quality Path Draft Determination'*, Report to Vector, August 2014 and are based on StatsNZ estimates. Actual residential ICP growth data sourced from ENA.

- Apply Castalia's estimates of total residential consumption growth for each EDB as set out in Table 3.3 as the forecasts for residential constant price revenue growth.

This section therefore assesses the impact of WELL's understanding of Vector's intention as noted above.

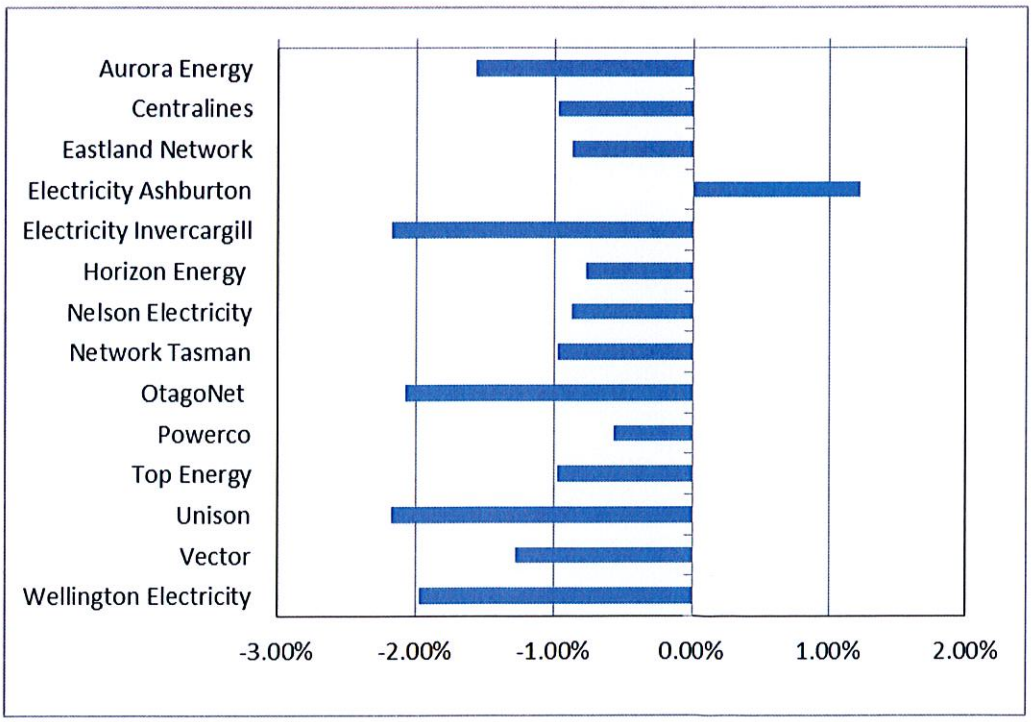
2.2.1. Vector option 1: Replace the Commission's forecast of zero growth per residential ICP with Castalia's estimates of NZ residential consumption growth per household

WELL understands that Castalia's estimates in Table 3.2 of total NZ residential electricity consumption per household in 2016 and 2021 are estimated by extrapolating historical trends. Based on Table 3.2, the growth rate in NZ residential electricity consumption per household between 2011 and 2016 is equivalent to approximately -0.93% annual average growth.

Figure 2 compares Castalia's estimated electricity consumption per household growth rate of -0.93% per annum with the actual annual average growth rate per ICP for 14 EDBs for the period 2010 to 2014. As demonstrated in figure 2, Castalia's estimate of -0.93% annual growth in residential consumption growth per household is significantly more optimistic than actual residential electricity consumption growth for almost all EDBs.

Consequently, Castalia's estimates of residential electricity consumption growth per household are not a material improvement on the Commission's CPRG model.

Figure 2 Difference between actual residential electricity consumption per ICP growth and Castalia estimates of growth in electricity consumption per household (annual average)[3]



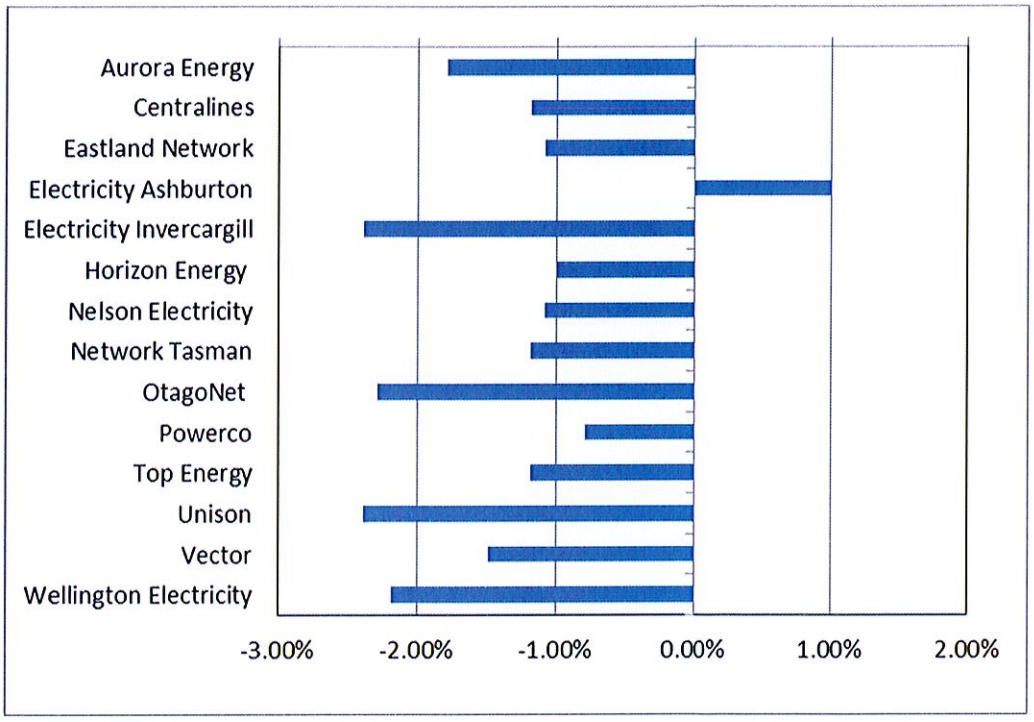
NB: A negative value means that consumption per residential ICP growth was less than Castalia's estimates.

[3] Estimates of annual residential consumption growth per household for period 2011 to 2016 sourced from Castalia, *'Review of Electricity Default Price-Quality Path Draft Determination'*, Report to Vector, August 2014, table 3.3. Actual average annual residential consumption growth data sourced from ENA.

Castalia also provides in Table 3.2 total NZ residential electricity consumption per residential ICP in 2011, 2016 and 2021 estimated using the same method as for residential consumption per household. Based on Table 3.2, the growth rate in NZ residential electricity consumption per residential ICP between 2011 and 2016 is equivalent to approximately -0.71% annual average growth. Figure 3 shows the difference between EDBs actual annual average growth rate and Castalia's estimates and demonstrates that Castalia's method also significantly over-estimates EDBs actual growth in residential consumption per ICP.

Consequently, Castalia's estimates of residential electricity consumption growth per residential ICP are also not a material improvement on the Commission's CPRG model.

Figure 3 Difference between actual residential electricity consumption per residential ICP and Castalia estimates of growth in electricity consumption per residential ICP (annual average)[4]



NB: A negative value means that actual consumption per residential ICP growth was less than Castalia's estimates.

[4] Estimates of annual residential consumption growth per household for period 2011 to 2016 sourced from Castalia, *'Review of Electricity Default Price-Quality Path Draft Determination'*, Report to Vector, August 2014, table 3.3. Actual annual average residential consumption growth data sourced from ENA.

2.2.2. Vector option 2: Use Castalia's estimate of residential consumption growth as the forecast of residential constant price revenue growth

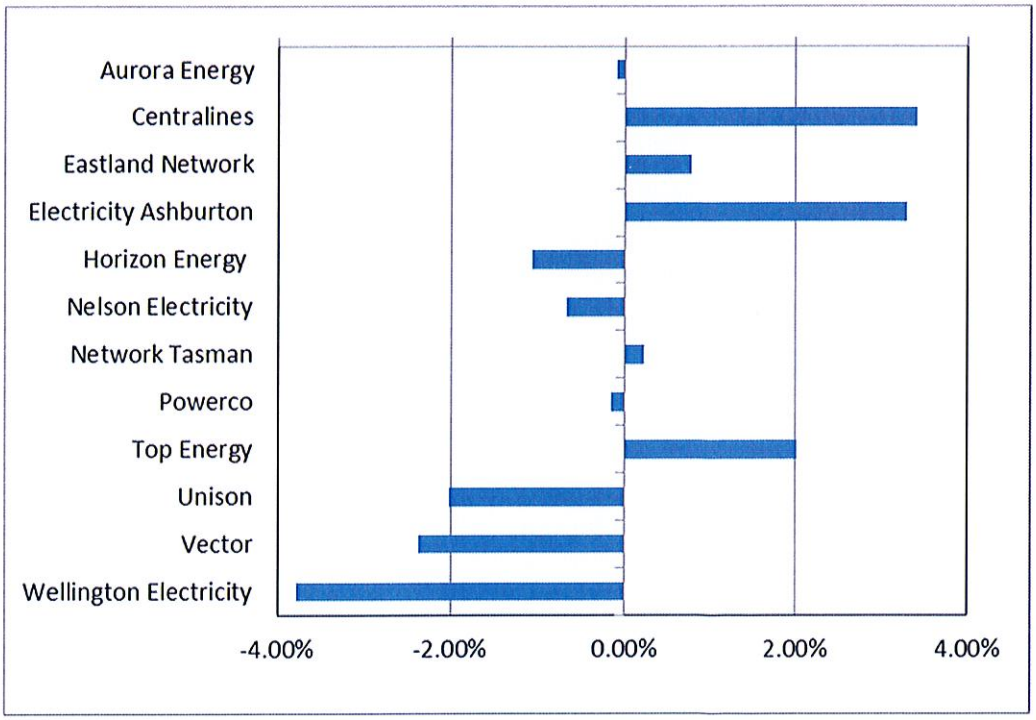
Castalia's Table 3.3 includes estimates of annual residential electricity consumption growth (per household and per residential ICP) for each EDB. Vector's suggested alternative is that these estimates could be used as the Commission's forecast of residential constant price revenue growth.

For the purposes of Table 3.3, Castalia has estimated 'actual' residential ICPs for each EDB by taking the total number of ICPs from EDBs information disclosures and assuming for every EDB that 87% of total ICPs are residential. WELL notes however that based on EDB responses to the Commission's April 2012 information request the proportion of ICPs that are residential ranges from 75% to 99% depending on the EDB. Therefore it should be noted that the residential consumption growth per ICP is based on an estimated not actual residential ICP numbers.

Figures 4 and 5 show the difference between actual annual average residential constant price revenue growth for 12 EDBs and Castalia's estimates of residential consumption growth (based on households and residential ICP estimates respectively).

Figures 4 and 5 demonstrate that applying Castalia's estimate of residential consumption growth as a proxy for residential constant price revenue growth still leads to material forecasting error. Therefore applying this method would also not result in a material improvement in the Commission's CPRG model.

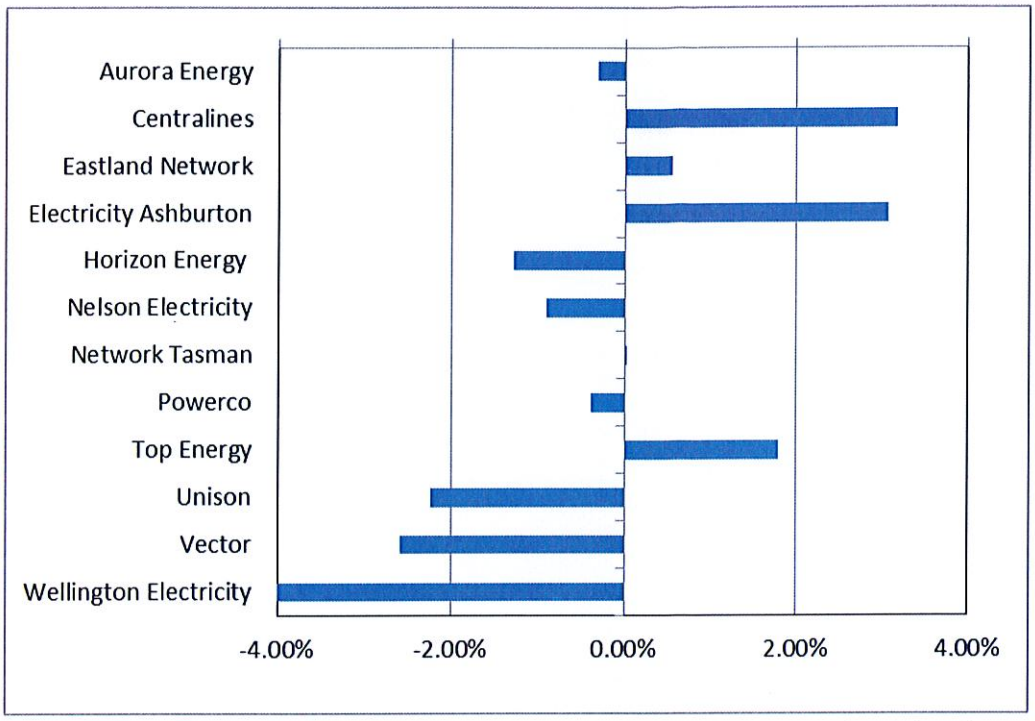
Figure 4 Difference between actual residential constant price revenue growth and Castalia estimates of growth in electricity consumption (based on per household growth) (annual average)[5]



NB: A negative value means that actual residential constant price revenue growth was less than Castalia's estimates.

[5] Estimates of annual residential consumption growth per household for period 2011 to 2016 sourced from Castalia, *'Review of Electricity Default Price-Quality Path Draft Determination'*, Report to Vector, August 2014, table 3.3. Actual residential constant price revenue growth data sourced from ENA.

Figure 5 Difference between actual residential constant price revenue growth and Castalia estimates of growth in electricity consumption (based on per residential ICP growth) (annual average)[6]



NB: A negative value means that actual residential constant price revenue growth was less than Castalia's estimates.

The above analysis also highlights WELL's concern that applying aggregate New Zealand wide assumptions to each EDB increases the risk of forecasting errors. For the 2012 DPP Determination the Commission accepted that CPRG forecasts should be based on more disaggregated data that better reflected EDB network areas.[7]

3. Recommendation

Based on the above analysis, WELL considers that none of Vector's suggested improvements would actually result in material improvements in the forecasting capability of the Commission's current CPRG model.

WELL therefore recommends that the best method available for forecasting CPRG for the 2015-20 DPP is a historical average of each EDB's actual CPRG over the period 2010 to 2014. The historic average growth rate should be based on the growth in weighted average demand using the following method developed by the Centre for Internal Economics (**CIE**) and proposed by WELL in its submission dated 15 August 2014.

[6] Estimates of annual residential consumption growth per household for period 2011 to 2016 sourced from Castalia, *'Review of Electricity Default Price-Quality Path Draft Determination'*, Report to Vector, August 2014, table 3.3. Actual residential constant price revenue growth data sourced from ENA.

[7] For example, the Commission revised its approach to the GDP forecasts included in the CPRG model by moving from New Zealand wide forecasts to regional forecasts.

As demonstrated by CIE, using historical data to forecast future values will over time balances out overs and unders in the forecasts relative to outturn, ensuring that over time EDBs and consumers are net present value (**NPV**) neutral. CIE demonstrate that using historic growth to forecast future growth has the same properties as an unbiased statistical model, resulting in an expected error of zero over a 20 year period and EDBs receiving +/- 2 per cent of expected revenue over a 20 year period. This is a material improvement on the Commission's current model which is not unbiased, and does not have an expected error of zero and is not NPV neutral for consumers.

Using historical data would therefore be more accurate than the Commission's current model, which has been demonstrated to be substantially inaccurate. Using historical growth would inherently take into account recent trends in energy consumption and connections growth. Using historical information to forecast future values is also consistent with the Commission's proposed approach to forecasting other key aspects of the DPP, including quality of supply targets, opex and capex.

Applying a historical average is consistent with the low cost nature of the DPP as it can easily be applied across all EDBs and is readily implementable for the 2015-20 DPP.

Figure 3: Recommended method for calculating constant price revenue growth

Weighted average demand growth:

$$WQ_t = \sum_{j=(r,c,i)} \frac{Q_t^j}{Q_0^j} \cdot \frac{R^j}{R} + \sum_{j=(r,c,i)} \frac{N_t^j}{N_0^j} \cdot \frac{RN^j}{R}$$

Where:

Q is quantity of electricity supplied;

N is number of connections;

R is total revenue, R^j is the revenue from volume components for customer class j; and

RN^j is the revenue from fixed charges for customer class j.

Using the information from its section 53ZD information request issued on 13 August 2014, the Commission should undertake this calculation by:

1. Calculating energy volume growth for each of the residential, commercial and industrial customer classes and weight the growth rates for customer group by revenue shares.
2. Calculating ICP growth for each of the residential, commercial and industrial customer classes and weight the growth rates for customer group by revenue shares.
3. Take a weighted average of 1 and 2 above by weighting ICP growth by the proportion of revenue that is fixed and weighting energy volume growth by the proportion of revenue that is variable.

Further, it is noted by Orion that not all EDBs have pricing structures that enable easy disaggregation of electricity volumes and ICPs into residential, commercial and industrial customer groups.[8]

WELL notes that the Commission's current CPRG model is predicated on these customer groupings, therefore further contributing to the misalignment between actual and forecast CPRG for those EDBs with incompatible tariff structures.

[8] Orion, *'Submission on the low cost forecasting approaches for DPP'*, 15 August 2014, page 4.

WELL's proposed method in figure 4 can resolve this problem as the calculation is undertaken independently for each EDB and can be applied using each EDBs relevant customer or tariff groupings. This approach would facilitate a closer fitting forecast in terms of both accuracy and alignment across customer types. The flexibility of WELL's proposed approach further demonstrates its appropriateness in the context of a low-cost DPP framework.

4. Closing

WELL appreciates the opportunity to make this cross submission response to submissions made on 15 August 2014 by other stakeholders on the Commission's consultation paper on the DPP Draft Decision and associated paper on Low cost forecasting approaches.

Please do not hesitate to contact Megan Willcox, Senior Regulatory Economist, on MWillcox@welectricity.co.nz if you have any queries.

Yours faithfully

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CHIEF EXECUTIVE OFFICER