Response to Proposed WACC Percentile Amendment

29 August 2014

1 Introduction and Summary

The Commerce Commission has proposed to change the weighted average cost of capital (WACC) for electricity lines businesses and gas pipeline businesses.[1] The proposal shifts from using the 75th percentile of the estimated WACC range to the 67th percentile. The Commission has asked for submissions on this proposal.

This note responds to the conclusions drawn by the Commission from the analysis carried out by Oxera.[2] Oxera's analysis of the expected loss to consumers from under- and over-estimating the true cost of capital is one of the factors cited by the Commission as evidence that the WACC should be reduced below the 75th percentile (paragraph X20.2).

We find that:

- The "reliability" effects quantified in the Oxera analysis are quite different from the effects assessed in our evidence[3] (and the evidence of other experts) on the impact of a low WACC on "economic" investments
- The impact that a low WACC would have on the benefits provided by "economic" investments is material. A sample of the economic investments recently commissioned and planned by Transpower has estimated net benefits of $2.5 billion. This is a material amount (including when compared with the impacts of reliability investments which, according to Oxera's analysis have a present value of between $8.6 and $26.0 billion). The impact of the decision on economic investment should be explicitly incorporated, including quantitatively, into the Commission's decision on the size of the WACC uplift. Assuming that Oxera's analysis on reliability impacts is correct, our analysis suggests that the economic benefits foregone by having a low WACC would justify the Commission using a WACC higher than the 67th percentile of the WACC range.
- Using the analytical approach presented by the Commission in Attachment C of its draft decision, we find that economic investments with a benefit-cost ratio (BCR) of greater than 1.38 would justify consumers paying the 75th

[1] The Commerce Commission, Proposed Amendments to the WACC Percentile for Electricity Lines Services and Gas Pipeline Services, 22 July 2014

[2] Oxera, Input Methodologies, Review of the '75th Percentile' Approach, 23 June 2014

[3] Castalia, "The Rational Response of a Regulated Transmission Company to a Low WACC" (report prepared for Transpower New Zealand Ltd, 1 May 2014)

percentile of the WACC range (assuming that no economic investment happens at a 50th percentile WACC). The economic investments implemented and planned by Transpower are all above this threshold.

2 Reliability and Economic Investments and Their Impacts

The "reliability" effects quantified in the Oxera analysis are quite different from the effects assessed in our evidence (and the evidence of other experts) on the impact of a low WACC on "economic" investments. This reflects the dual purpose of networks—to provide reliability and to enable low cost sources of supply to meet demand. The losses from the two effects are therefore cumulative. However, the Commission appears to account for the potential social losses from reliability effects more directly than the losses that would be borne from less economic investment.

Oxera's analysis estimates the asymmetric value of network reliability

Oxera focuses on medium to long term network reliability to evaluate the wider social and economic effects of the choice of WACC.[4] Oxera estimates the asymmetry of social loss using the probability and cost of an unreliable power supply. Oxera estimates that a severe outage resulting from underinvestment could have an annualised economic cost of between $1 and $3 billion. [5]

We agree that an unreliable network creates social losses for consumers. As reliability decreases, the probability of network failure increases. A network failure has financial costs for businesses in decreasing production or productivity. For residential consumers, network failure represents a lower quality of service and decreases the value of the network to each consumer.

Based on the value of social losses from a decline in network reliability, Oxera recommends using between the 60th and 70th percentile of the WACC range. The range is above the 50th percentile because Oxera concludes that there are asymmetric losses from lower network reliability.

Our analysis focuses on the efficiency effects of achieving lowest-cost supply

In contrast to Oxera's reliability effects analysis, our evidence focussed on the losses that arise because a lower WACC may reduce economic network investments that provide net benefits to consumers by achieving the lowest supply chain costs (from supply through networks to demand).

A reduction in valuable economic investment clearly creates social losses for consumers. The major social loss comes from having to rely on higher cost sources of supply to meet demand. While not required to maintain service standards, economic investments can lower the cost of supply by unlocking efficient solutions throughout the energy supply chain.

Under its capex input methodology, Transpower is required to show that economic investments have net benefits. This allows market participants and other interested parties to comment on the rationale for the investment, and whether the investment is in the long-term interests of consumers.

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[4] Oxera Review of the 75th Percentile Approach, 23 June 2014.

[5] Oxera Review of the 75th Percentile Approach, 23 June 2014.

Although Transpower has an obligation to identify economic investments, these investments are not required to meet other regulatory obligations (such as reliability standards). Economic investments are therefore discretionary and rely heavily on Transpower's incentives to invest. The impacts of not making economic investments are also very subtle—with consumers paying slightly higher prices for electricity (due to a less optimal mix of generation and transmission).Because it is not obvious if economic investments have not occurred, if the WACC is too low, then Transpower is able to decrease its level of economic investment. This eliminates a source of benefit to consumers and means that customers will be paying higher prices than if the optimal investment had taken place.

Both effects need to be taken into account when estimating an asymmetric loss function

The descriptions above highlight that the social losses estimated by Oxera are different from the social losses discussed in our report. However, in its summary of expert reports, Oxera describes our submission as a bottom up version of the same analysis carried out by Oxera.[6]

We consider that Oxera has mischaracterised our analysis. Losses from any reduction in economic investment are quite distinct from losses that arise from lower levels of reliability. In our view, the two losses identified in the Oxera and Castalia reports should be treated as cumulative.

The Commission does not explicitly quantify the effects of economic efficiency

The Commission acknowledges that "the available evidence supports using a WACC significantly above the mid-point estimate."[7] The Commission then has the task of selecting an appropriate percentile above the mid-point. Although a range of expert opinions are cited, the Commission explicitly places weight on the recommendation from Oxera.

The Commission uses the Oxera analysis to set the lower bound of the range to 60th percentile.[8] As highlighted above this lower bound is derived only from looking at reliability investments, and does not include the effects of economic investments. This suggests to us that the lower bound must actually be higher than the 60th percentile. The Commission does point out that Oxera ignores factors that could weaken the case for a WACC uplift, such as cost savings to consumers from reduced investment.[9] The Commission also recognises that factoring in potential benefits from other types of investment would strengthen the case for using a WACC above the mid-point estimate. The Commission considers these factors to be offsetting. However, our view of the evidence is that the factors suppressing the optimal WACC are likely to be small relative to the losses from reduced economic investment.

The Oxera analysis suggests that the 70th percentile should be used as an upper bound. The Commission concludes that the 75th percentile is a reasonable upper bound for the WACC range. Although it acknowledges there is some analytical support for a WACC above the 75th percentile (including the evidence of Dr. Martin Lally[10]), the Commission

[7] The Commerce Commission, Proposed Amendments to the WACC Percentile for Electricity Lines Services and Gas Pipeline Services, 22 July 2014. page 70

[8] Ibid, page 70.

[9] Ibid, page 65.

[10] Martin Lally, The Appropriate Percentile for the WACC Estimate, 19 June 2014

also concludes that evidence of observed levels of investment suggests the 75th percentile is sufficient to incentivise investment.

One of the factors leading the Commission to extend the upper bound of the WACC range is that "factoring in potential benefits from other types of investment (for example increased innovation, or investment designed to reduce grid congestion) is likely to strengthen the case for using a WACC above the mid-point estimate."[11] The Commission is referring to the midpoint of the range suggested by Oxera of 60th to 70th percentile. This appears to recognise at least some of the benefits provided by economic investment. Whether the effect of the adjustment is appropriate clearly depends on the likely scale of the benefits provided by economic investment. The Commerce Commission has not attempted to quantify this effect, and instead relies on judgement to determine its impact on the WACC decision.

3 Quantitative Estimates of the Benefits of Economic Investments

Oxera has quantified the losses that could occur as a result of lower reliability due to less investment. In this section, we quantify the potential losses from reduction in economic investments, using empirical evidence gathered through the Investment Test applied for major capital expenditure carried out by Transpower. We find that these economic losses are material when compared with losses from reliability impacts. We also extend the Commission's analysis on the BCR ratio required to ensure positive net benefits with a WACC uplift, and find Transpower's economic investments have generally exceeded the threshold required to justify an uplift to the 75th percentile.

The benefits of Transpower's planned economic investments are material

Transpower carries out detailed analysis of all investments—reliability and economic—in accordance with its capex input methodology. The input methodology prescribes the benefits that can be included in the analysis, and specifies that a project must demonstrate a positive expected net electricity market benefit to be approved for investment.

The investment test process therefore provides a rich source of empirical evidence for the current WACC review, which has not yet been used by the Commission. The investment test provides a real analysis of the expected economic benefits of these projects. This analysis can (and should) be used to provide a robust bottom up argument for the net benefits of economic investments foregone.

The table below summarises Transpower's analysis of each of the economic investments carried out over the past 2 years, and an example of future investment proposals. This is just a sample of economic investments; it excludes most of the smaller economic investments and some larger ones for example the 4th Cook Straight cable and the replacement of Pole 2.

Table 3.1: Transpower's Economic Investments

Project	Commissioning Year	Net Benefits in PV year $m	Net Benefits in 2014 $m	BCR

[11] Ibid, page 71.

Project	Commissioning Year	Net Benefits in PV year $m	Net Benefits in 2014 $m	BCR
Pole 1 replacement (Pole 3)	2013*	200	321	1.51
Wairakei ring	2014*	500	750	7.94
Kawerau	2013*	100	123	14.47
Bunnythorpe-Haywards reconductoring	Each year to 2020	850	910	6.68
Clutha Upper Waitaki Lines Project (CUWLP)	2 upgrades committed, 3 upgrades under review, review scheduled for 2015	300	421	3.39
Total	**-**	**1,950**	**2,524**	**-**

Source: Transpower

- *actual commissioning year
- The BCR has been calculated for approved projects based on information in the Grid Upgrade Plan/Major Capex Proposal.
- Net benefits have been rounded and converted to a 2014 value by compounding forward or discounting back to 2014 dollars. 7% rate is used as per D7(3) schedule D of the Capex IM.
- The ratio is calculated as the total benefits (excluding transmission costs)/transmission costs.
- The Clutha Upper Waitaki Lines Project (CUWLP) was formerly known as the Lower South Island Renewables Investment Proposal.

The present value of net benefits of this sample of commissioned and planned economic investments is $2.5 billion. Considering this is just a sample of economic investments, it is a significant source of benefits, even when compared with the $8.5 to $26 billion present value social losses identified by Oxera from reliability investments.

Significant changes in the development of a new generation resources or significant shifts in demand (such as closure of Tiwai Point) could result in the benefits from investment being much higher. Other projects may also emerge that would provide additional net benefits. In our view, the present value of net benefits from economic investments is therefore likely to be higher than the current estimates prepared by Transpower.

Oxera recommends a range above the mid-point, 60th to 70th, because of asymmetry of social losses in reliability. In its decision, the Commission essentially allows an uplift of 2 percentage points from the mid-point of Oxera's range to factor in the benefits from innovative investments. The size of the likely benefits that would be foregone with less economic investment compared to reliability losses appears to justify an uplift that is greater than 2 percentage points.

One way to incorporate this insight into the Commission's WACC decision is to shift the range upwards. Given that the lower bound of the 60th percentile does not consider economic investments at all, this suggests that the lower bound must be higher than the

60th percentile. Increasing the upper end of the range to above the 75th percentile would also better reflect the evidence of experts such as Dr Martin Lally.[12]

Using the Commissions analysis, Transpower investments exceed BCR threshold for a 75th percentile WACC

The Commission has undertaken an initial analysis to investigate the benefits that arise from providing an uplift to the WACC. In Attachment C of its paper, the Commission explores what impact non-reliability effects might have on the decision of how much WACC uplift to adopt. This analysis was loosely based on our analysis of what type of investment might not occur with a low WACC.

The Commission's analysis suggests that if no non-reliability investment takes place at the 50th percentile of the WACC range, then consumers would rationally be prepared to pay the 67th percentile as long as the benefit-cost ratio (BCR) of the investments is greater than 1.25. If half of the investment would take place using the 50th percentile, then the BCR of the projects would need to be 1.5 to make the investment efficient. A project that has a higher BCR than this threshold would provide benefits to consumers over and above the cost of the WACC uplift.

The same analysis can be used to test the minimum BCR required for economic projects to improve outcomes for consumers if the 75th percentile of the WACC range is used. Using the same assumptions as the Commission, the cost of an uplift from the 50th percentile to the 75th percentile would be $150 million over the five year period. If no non-reliability investment takes place at the 50th percentile of the WACC range, then consumers would rationally be prepared to pay the 75th percentile as long as the BCR of the investments is greater than 1.38. Consumers will be paying $550 million to provide incentives for the company to invest $400 million.

If half of the investment would take place at the 50th percentile, then the BCR of the project would need to be 1.75 to make the investment efficient. Consumers will be paying $350 million to provide incentives for the company to invest $200 million.

Table 3.2: BCR Required to Justify a WACC Uplift

	Required BCR for 67th percentile	Required BCR for 75th percentile
No investment at 50th	1.25	1.38
Half investment at 50th	1.5	1.75

Source: Castalia analysis using assumptions from Attachment C of Commerce Commission Proposed Amendments to the WACC Percentile 22 July 2014.

All of the investments in Table 3.1 show a BCR of greater than 1.38. The Wairakei ring, Kawerau, Bunnythorpe-Haywards reconductoring and CUWLP investments all exceed the 1.75 BCR threshold. This provides empirical support for the conclusion that the benefits provided by Transpower's economic investments justify an uplift of the WACC to at least the 75th percentile.

[12] Martin Lally, The Appropriate Percentile for the WACC Estimate, 19 June 2014.

4 Conclusions

The Commission must take care not discourage discretionary economic investment. The potential economic benefits foregone from a decrease in economic investment are material. We consider that potential losses from reduced economic investment should be explicitly factored in to the Commission's decision on the WACC uplift. The current uplift of 2 percentage points seems small when placed alongside the uplift that is justified solely by reliability impacts estimated by Oxera.

By applying the Commission's own analytical framework, we find that the BCR of Transpower's planned economic investments exceed the threshold to incentivise an uplift to the 75th percentile WACC. These net benefits mean that economic investments will still be efficient even if consumers are asked to pay the 75th percentile of the WACC range or higher.