MAJOR ELECTRICITY USERS' GROUP

Mr John Groot
Commerce Commission
By email to regulation.branch@comcom.govt.nz

Friday, 11 May 2012

Dear John

MEUG CROSS SUBMISSION ON TRANSPOWER LEVERAGE RE-CONSULTATION

1 General comments and introduction

1.1 This cross submission is by the Major Electricity Users' Group Inc ("MEUG") and responds to Transpower's submission dated 5 April 2012 including the accompanying reports by PricewaterhouseCoopers ("PwC") and Professor Guthrie.

1.2 As with MEUG's original submission, this cross submission refers to the 23 December 2010 IM determination and reasons paper and the Commission draft IM decision and reasons paper issued in June 2010 as the "December decision", "December reasons", "June decision" and "June reasons" respectively. MEUG will refer to the 5 April Transpower Submission as such and the accompanying reports as the "PwC report" and "Guthrie paper" respectively.

1.3 As mentioned in section 3 below, MEUG considers misleading the use by Transpower, the PwC report and the Guthrie paper of the terms "real" or "actual" in relation to Transpower's WACC. In this cross-submission we use "real" and "actual" to mean the cost of capital or WACC that is what a firm is paying from time to time. It expressly does not distinguish a WACC calculated using actual or forecast leverage or other figures in the model parameters, from a calculation using market drawn averages. Both of those are estimates or notional figures. A WACC calculated for application in an input methodology, and subsequently a price quality path determination, are referred to as "regulatory WACCs".

1.4 MEUG continues to rely on all its earlier submissions filed during the original IM determination process and on its submission dated 5 April 2012 concerning the Commission's reconsideration of Transpower's leverage.

2 Summary

2.1 The Transpower submission against the Commission's notional leverage of 44% illustrates the can of worms opened by the Commission's adoption of notional leverage as the fix for the leverage anomaly. Instead of being curative, notional leverage has perpetuated the leverage anomaly.

2.2 It has drawn suppliers into arguments that incorrectly treat the model's rising curve for leverage as if it reflected the real world and financial orthodoxy.

2.3 Transpower's submission and the supporting papers endeavour to persuade the Commission away from a model to estimate the WACC of a notional efficient participant in a competitive market. Instead they seek Commission blessing for the estimated WACC of a monopoly supplier using the supplier's parameters.

2.4 Transpower's submission demonstrates the susceptibility to gaming of the flawed CAPM/WACC formulation when suppliers are induced to believe that it is legitimate to treat WACC as variant with leverage, even if only to a single notional leverage. MEUG submits that the objectives of the Commission's decision to use a notional value in the December decision will only be achieved if the Commission now adopts the optimum leverage, zero under the Simplified Brennan-Lally Capital Asset Pricing Model / WACC formulation ("SB-L CAPM").

2.5 The Guthrie paper denies that there is a practical regulatory benefit to Transpower from gaining access to a higher parameter value for leverage (by connection to Transpower's leverage). MEUG considers that the Guthrie reasoning illustrates the danger of leaving such a parameter open to misinterpretation.

2.6 Transpower's changes to its policies since the December decision increase its leverage from 51% in 2010 to 71% by 2014 and reduce net equity by $77 million. The leverage anomaly is readily exploitable if the parameter is determined from Transpower's estimated leverage. The perverse incentives in the SB-L CAPM should be cauterised entirely by the Commission reverting to an optimal leverage parameter which solely because of the flaw must (for the SB-L CAPM) be set at leverage equals zero.

2.7 Transpower and its experts adopt circular reasoning when referring to Transpower's "actual" or "real" WACC: they apply the flawed model to justify expanding the impact of the flaw in the model as a way of increasing regulatory WACC.[1]

2.8 Applying any of Transpower's proposed leverage suggestions would result in a materially higher regulatory WACC for Transpower than for distribution companies. That would not reflect the

[1] See for example paragraph 29.2 of the Transpower submission.

relative risks. It is counterintuitive. Such a reasonableness check of this application of the flawed model rules it out.

2.9 If it is accepted (as Commission and PwC have) that WACC in New Zealand is insensitive to changes in leverage, the increase in WACC when the leverage parameter changes from the optimal value of zero to the Commission's notional value of 44% (as demonstrated in the table at Appendix B and C) undermines the integrity of the model. Nor is it a reflection of conditions in a competitive market where participants are driven to optimise their cost of capital.

2.10 Using an optimal leverage simulates the expected outcomes in a New Zealand competitive market, where the market value of an investment is not affected by the relative proportions of debt and equity.

2.11 Optimal leverage should be the starting point for the Commission. It is the only leverage that is not tainted by the leverage anomaly. Transpower assert, but have not provided evidence, that the use of neutral leverage or even the Commission's 44% notional value would "systematically under-estimate WACC"[2]. Mere assertion should not give the Commission cause to compromise a neutral regulatory position.

2.12 The Transpower submissions should now reassure the Commission with the advantage of sixteen months since the December decision that there are no persuasive reasons to refrain from setting the leverage parameter at its optimum of leverage equals zero, to remedy the universally acknowledged flaw.

3 Preliminary Observations

Focus on outcomes produced in workably competitive markets not Transpower's costs from time to time

3.1 The Transpower submission seems to be based on a notion that the methodology for Transpower should be judged by how close the WACC the input methodology produces is to Transpower's expected cost of capital, not the cost of capital of an optimising participant in a competitive market. If we have correctly understood them, Transpower's experts appear to be arguing that the Commission should be trying to make the model measure Transpower's actual costs from time to time. If so, they are effectively arguing for an input methodology that would reinstate for Transpower a cost plus pricing approach under monopolistic conditions.

3.2 For example:

(a) The Transpower submission and expert papers make repeated reference to Transpower's "actual WACC" or "own WACC" as if Transpower has derived a cost of its

[2] Refer to paragraphs 4, 14, 22.1 and 29.2 of the Transpower submission.

capital empirically or objectively. [3] If so we have not found any description of such a process.

(b) Instead, the references relate to statements of Transpower's intended or forecast WACC applying an estimation model that must be similar to SB-L CAPM. If so it embodies and exemplifies the anomalous effect of leverage in the SB-L CAPM. The use of Transpower's intended leverage makes the result no more "real" or "actual" than the product of the Commission's model.

(c) More importantly, this approach seems to miss the point of the input methodologies. They are not designed to measure and validate a monopoly supplier's actual cost of capital. The actual cost is a reflection of decisions by the supplier acting under monopoly conditions. The regulatory regime reflects the likelihood that without rules simulating competitive pressure, the supplier's costs and charges may be far from the optimum assumed to be the target of firms in a workably competitive market.

(d) The input methodology is designed to elicit a cost of capital that a competitive firm could achieve if it was optimising its cost of capital. Accordingly, what Transpower chooses to do by way of leverage is of only passing interest. If, as a result of its leverage choice its actual cost of capital is higher than the estimate derived from market data, that is a matter for its shareholders to take into account. It is not for consumers to be required to compensate Transpower.

(e) MEUG has been reluctant to reach the conclusion that Transpower and its experts could so profoundly misconceive the purpose of the input methodology. But the Guthrie paper criticises the Commission (at paragraph 37) for failing to note that Transpower's "actual" WACC increases as leverage increases. If true, this observation simply underscores a view that Transpower is not operating as a rational competitive business. How else could it increase leverage if that increases real costs, and consequently charges? It would be obliged to confine its charges to what a competitor would charge with the benefit of a lower cost capital structure.

(f) Based on its submission, and its expert's concurrence that increasing its leverage will increase its actual cost of capital, Transpower seems to seek special treatment because it has a government owner with a preference for dividends ahead of a lower cost of capital. That is not a legitimate consideration for the Commission. The owner of Transpower must live with the regulatory fact that its charges will be based on the capital mix that would be adopted in a workably competitive business where both debt and equity are mobile. The owner not the consumer, should carry the cost (in terms of reduced future dividend capacity) of a decision to oblige Transpower to adopt a less than optimal gearing.

[3] Ibid; pages 5 and 7 of PwC report; pages 1, paragraphs 4, 8, 19, 37, 39, 41, 42, 49 of the Guthrie paper.

(g) Put simply, even if the government has constrained equity and is demanding dividends part way through a large capital investment programme (probably contrary to what would pertain with a business operating in a workably competitive market) and the consequently increasing leverage is increasing Transpower's cost of capital, that is immaterial to the decision the Commission must make.

(h) MEUG does not share the view of Transpower and its experts that increasing leverage will increase its overall cost of capital, within limits (that are not reached by Transpower forecasts). MEUG prefers the more orthodox predictions of the CAPM[4], that WACC is invariant to leverage in a market where there is near tax neutrality. The following discussion contrasts the claims of Transpower that they will have a "real" or "actual" WACC that rises with rising leverage, with the obligation of the regulator to treat Transpower as if it optimises its WACC, but MEUG does that only to remind the Commission that Transpower's claims are irrelevant whether or not they are true. MEUG has seen no evidence that Transpower's real cost of capital has risen, or will rise materially with increase leverage (in the range forecast by Transpower). This may be because of a perceived implicit government guarantee, or for other reasons, discussed below at 4.10 et seq.

Transpower exploits the leverage anomaly

3.3 MEUG is concerned that the Commission's compromise fix for the leverage anomaly in the SB-L CAPM, has encouraged an institution as weighty as Transpower, and its experts, to treat the orthodox understandings of the CAPM as if they were less compelling than an intuitive "feeling" that an actual cost of capital increases with leverage. The Commission and the PwC report have acknowledged that in the New Zealand context WACC is insensitive to changes in leverage. Conventional academic literature continues to support the view that the WACC of a firm is invariant to the firm's capital structure[5]. Despite that, the SB-L CAPM increases the calculated WACC when the leverage parameter increases above zero. That means the optimum leverage when applying SB-L CAPM is zero. The error in the calculation when non-zero leverage is introduced has been accepted as the "leverage anomaly".

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[4] See for example Benninga S 2011, *Principles of Finance with Excel (2nd ed).* page 566

[5] Ibid. Page 566 is unequivocal:

"Summing up

The theory of capital structure suggests that the capital structure decision is largely driven by the differential taxation of debt and equity. The empirics of capital structure suggest that it doesn't matter very much in determining the value of the firm.

For practical purposes,

- *You can assume that the weighted WACC of a firm is invariant to the firm's capital structure.*
- *This means that the WACC of a firm can be measured by taking the average WACC of the firm's industry. It also means that the β_{Asset} of a firm's industry is representative of the industry's overall risks and is not a function of the capital structure of the industry."*

3.4 We make no apology for restating these truisms, because they are apparently accepted by Transpower and its experts, but they then develop their arguments as if they had not made that admission. They treat the anomaly as theoretical, and proceed as if in reality competitive firms would seek to capitalise themselves in ways that increase their cost of capital above optimum.

3.5 There is no way to read the submission of Transpower and its experts as anything other than a assertion that any leverage parameter less than its own actual or forecast leverage would have the effect of under-estimating its WACC. It seems to be saying that it chooses to increase its cost of capital by increasing leverage.

3.6 Transpower's claim of an "under-estimated" WACC relies on a comparison between one produced using the Commission's notional leverage and one produced using a higher leverage parameter, namely Transpower's actual forecast leverage. The positive leverage parameters inherent in both mean that calculated WACC is inflated by the anomaly in both cases. Only optimal leverage eliminates the fundamental problem with the SB-L CAPM formulation.

3.7 It is not relevant that leverage is observed in the market. That observation does not tell us that the wide range of gearing observed indicates a correspondingly correlated range of WACCs. The problem lies in the way the model responds to leverage, not in whether the model needs a positive leverage parameter to work. It does not. When leverage is immaterial to cost consistent with outcomes in competitive markets, changes to leverage should not affect WACC in the first place. In the real world and the world of an unflawed model WACC is the same for zero leverage or 44% or 71%. To eliminate the anomaly, only the optimal leverage (for this model) of zero leverage achieves that.

3.8 By applying a notional leverage of 44%, the leverage anomaly in the December decision raised WACC by 0.73%. Transpower's forecast leverage of 71% would raise WACC by a further 0.45% (refer to Appendix C). MEUG submits that the confusion evident in the Transpower submission should now lead the Commission to revisit the crude fix of the anomaly. It has undermined the intellectual credibility of the IM. The accepted wisdom is that WACC is invariant to leverage. That insight can be restored to the input methodology model, simply and clearly.

3.9 Further, if it was true that leverage increases the cost of capital, any notional leverage or departure from the consequently optimal leverage is not a true reflection of conditions expected in a competitive market. If competitive, Transpower would surely argue for the most efficient leverage possible, producing the lowest (i.e. the optimal) cost of capital. Even taking Transpower's submission at face value, if they believe their genuine "actual" or "real" WACC increases with leverage consistent with the flawed SB-L CAPM formulation, Transpower would strive to eliminate all leverage above the optimum. It would not be efficient for its owner to do anything else, for it could presumably maximise the value of Transpower by 100% equity financing. The directors of Transpower are under a legal duty to act in the best interests of the company, not its shareholders. It would be awkward for them to authorise dividends if they

genuinely believed that increasing leverage would increase their cost of capital, because that would seem not to be in the interests of Transpower.

3.10 MEUG thinks that instead Transpower and its directors in reality act in accordance with the established understanding, that leverage, within bounds, does not increase genuine actual WACC. Whatever Transpower or its owners choose to do, in a competitive market it could not pass the cost of failing to optimise its WACC onto consumers.

3.11 The PwC report for Transpower, whereby PwC seems comfortable with WACC increasing with increases in leverage, appears to differ from its objection in a previous PwC report (for Telecom) to using an optimal leverage. As summarised by the Commission[6]:

> *"AECT, ENA, Powerco, Telecom, PwC (for Telecom), Unison, Uniservices (for NZAA) and Vector all disagreed with the zero leverage assumption proposed by the submissions from Ireland, Wallace & Associates (for MEUG). 913 They submitted the zero leverage assumption is inappropriate, as it does not recognise that most infrastructure firms have debt in their capital structures* ***and is inconsistent with workably competitive market outcomes, as debt financing (up to a point) is considered to lower WACC****. These arguments generally imply that leverage reduces WACC in practice, but adoption of a non-zero leverage and the simplified Brennan-Lally CAPM would result in a higher WACC. [emphasis added]"*

3.12 Clearly from these objections even zero leverage risked overstating WACC.

3.13 MEUG does not share these concerns as the formula L=0 is not intended to reflect **actual** leverage, but denotes the optimum position, using the flawed model, whereby WACC is made invariant to leverage changes.

3.14 The PwC report and Guthrie paper assert that optimal leverage would under-estimate WACC but provid no independent analysis to support the opinions. Both papers relying instead on Dr Lally's advice to the Commission.[7] The basis for Dr Lally's view that WACC could be understated if L = 0 was "*because it would ignore the relative illiquidity of corporate bonds and the presence of bankruptcy costs*". However, Dr Lally's paper also pointed to qualitative benefits unique to debt financing which are also not incorporated in the model. But in any event, the argument is a red herring as the issue at hand is how to address a flaw in the model which the Commission itself has recognised can lead to substantial increases in WACC that are unrelated to the actual market cost of capital.[8]

[6] December reasons, H3.24

[7] Lally, M: Report to the Commerce Commission, 17 November 2009

[8] December Reasons Paper, paragraphss H3.12 and H3.20

3.15 Mr Ireland pointed out on behalf of MEUG, in response to Dr Lally (emphasis added)[9]:

> *"The fundamental assumption underlying Brennan Lally CAPM is tax neutrality. The implication therefore is the WACC should be indifferent to the way the firm is financed as there are no tax advantages when both corporate and personal taxes are considered. WACC should be a straight line.*
>
> *WACC as proposed by the Commission does not reflect tax neutrality. Dr Lally says it can't be fixed. "… WACC (even if measured in a way that properly deals with these issues) would rise with leverage." [Note p6]*
>
> *However when the assumed leverage is zero the cost of equity **does** equal WACC and [the] tax neutrality assumption is satisfied. The WACC model is validated when leverage is ignored. The Brennan Lally CAPM is not broken and doesn't need to be fixed.*
>
> *The Commission should adopt a WACC that is indifferent to leverage as it reflects the fundamental assumption of tax neutrality. A WACC that increases with leverage is just wrong. A WACC that is indifferent to leverage is appropriate."*

3.16 Mr Ireland's point was that the SB-L CAPM formulation should reflect its fundamental assumption of tax neutrality. Any additional benefits and costs of leverage in capital structure, other than tax, could be considered if supported by empirical evidence, and an appropriate adjustment considered at that point.[10]

Valuation test

3.17 There is a simple test of the realism of a model that increases the WACC with increases in leverage. It would mean that leverage reduces the value of the firm (the inexorable reciprocal of an increase in the cost of capital under tax neutrality between debt and equity). It would seem absurd for the Commission to treat a competitive market as fostering that outcome.

3.18 Applying the approach urged on the Commission by Transpower, the value of Transpower must decrease with leverage. If WACC increases by 1% from 10% then $1 previously invested becomes worth $0.91 (and decreasing leverage would increase value). The intention of the WACC model was to reflect that WACC is independent of leverage because there is are no tax advantages in choice of equity or debt capital.

3.19 The same applies with the Commission's fix, of a neutral leverage of 44%. Transpower could still increase its value by 100% equity.

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[9] Ireland, Wallace & Associates Limited: Report to MEUG *IM Cost of Capital Post Workshop Submissions*, 2 December 2009, page 2

[10] Ibid, at p 3

3.20 Businesses would not routinely introduce leverage into their capital structure if the anomaly reflected reality. There are many reasons for debt financing but they must defer to the effect on overall wealth of the providers of the capital (given substantial tax neutrality).

3.21 The Commission now has, in the experience of this Transpower challenge, direct evidence of a pernicious effect from its compromise fix for the flaw in the SB-L CAPM formulation.

3.22 The Transpower submission would in fact take the logic of the 'fix' and extend the application so as to turn the CAPM on its head. The logic of the 'fix' so extended would negate the core insight of the CAPM (that the WACC is invariant to leverage). In so doing it offers Transpower a cost plus compensation for what would be perverse financing choices, if their submission is taken at face value. But in reality it delivers a windfall gain because leverage does not increase the WACC and the rising curve in the SB-L CAPM is just a flaw.

3.23 The Commission can easily restore intellectual integrity to the methodology by establishing WACC as indifferent to leverage, by prescribing zero leverage for the calculation. The Commission's advisor Associate Professor Lally concluded that "*… there are some deficiencies in the WACC model currently employed by the Commerce Commission, but these are not readily correctable…*".[11] MEUG disagrees. Transpower would not have been lead into the conceptual confusion if MEUG's straightforward solution had been adopted. The Commission now has the opportunity to remedy this.

3.24 If Transpower (or the Commission) has evidence that the resulting calculation would produce a WACC lower than what the market would demand to finance Transpower, it should reveal it. Even with such evidence, the solution would not be to insert parameters in the chosen CAPM formula that undermine its intellectual integrity. Instead the methodology should state the extent to which the Commission considers the model has a gap with what the market demands, and address that directly.

3.25 The uncertainty (or generosity) margin already provided in the methodology (fixing the point estimate at the 75th percentile instead of the centre of the range) may already overcompensate.

3.26 Nullifying the flaw would mean the Commission would not have to be concerned with specific financing of any suppliers. Removing the incentives to use the intellectual vulnerability of the anomaly 'fix' would provide enhanced certainty for all parties, consistent with incentivising investment and meeting the purpose of input methodologies.

Flawed assumptions

3.27 Transpower has asked the Commission to consider two options proposed by experts, in the PwC report and Guthrie paper. MEUG thinks there are serious flaws in the general assumptions in the PwC report and Guthrie paper.

[11] Lally M. *WACC and Leverage,* 17 November 2009.

(a) **June 2010 base:** The PwC report uses sample data from the June reasons paper. It claims that is more appropriate than using the data from the December decision because the December data has not had the benefit of testing in consultation[12]. With respect MEUG finds that disingenuous. This re-consultation was ordered, in part, to enable such testing.

MEUG thinks it more likely that the PwC report avoids use of the bigger sample, and more thoroughly analysed data, to avoid attention to the Commission's flimsy reasons for failing to adjust the a 0.34 asset beta to the average from the updated sample. The PwC report explains that its beta analysis is based on the June reasons paper as this is the sample that was open to consultation and "*… did not lead to a change in its asset beta parameter estimate*". Had they used the updated December sample, PwC would surely have been obliged to express some view on the odd use by the Commission of an asset beta average not drawn from the same sample as the leverage figures. As MEUG pointed out in its 5 April submission, the asset beta parameter of 0.34 set in the Commission's December decision is not supported by the updated December data used to calculate the adjusted 44% notional leverage in the December decision.

(b) **Selective parameter assessment:** Despite confirmation from the Commission that the scope of the consultation included leverage and other directly relevant components[13] both the Guthrie paper and PwC report have examined leverage in isolation, leaving all other parameters unchanged. As a result of this constraint a number of interrelationships are neutralised.

(c) **Debt premium:** Both PwC and Guthrie approach the debt premium applying the comparators used by the Commission for the whole sector, while urging the Commission to interpolate Transpower's actual figures for the leverage parameter. They emphasize the importance of the credit rating. The comparator sample is assessed at BBB+ with a margin of 2% (plus 0.35% issuance cost) which relates to an average leverage of 44%. Transpower's current rating is AA- (S&P). Though it is seeking to move to a leverage of up to 71%, the relevant debt premium will likely remain substantially lower than 2.35%. There is no evidence that the leverage will affect that. And even if it does, it would seem to be a non-optimising choice by Transpower.

(d) **Asset beta:** Both PwC and Guthrie accept that the asset beta should remain at 0.34 as per the June reasons. But that asset beta relates to average leverage of 42% for the same comparator. The mean asset beta of the enlarged comparator sample contained in the December reasons was 0.28. As MEUG submitted in April, the asset beta in the December decision should have changed to 0.28 otherwise the de and re leverage

[12] PcW paper, footnote 45 on page 22.

[13] Refer to "*Response to Franks and Ogilvie 21 March 2012*" letter available on the Commission's website.

symmetry is lost. This issue is inextricably interconnected with the question of the value to be attributed to the leverage parameter.

(e) **Debt beta:** The PwC report and Guthrie paper suggest that problems in using actual leverage will be mitigated by reversing the decision of the Commission not to apply a debt beta. They go on to suggest ways to derive a debt beta. PwC illustrate the application of debt betas as follows:[14]

> *"The Commission, in its [June] Reasons Paper, assessed a mean asset beta estimate for its sample of comparator companies of 0.34 assuming a debt beta of nil. If these investment grade utility companies are all assigned a debt beta of 0.08, then the resulting mean asset beta estimate becomes 0.3768"*

The analysis assumes that it could be applied to the inconsistent Commission leverage and asset beta parameters. Transpower and advisors have not explored these inconsistencies.

Transpower's Alternatives

3.28 If the Commission maintains its decision not to use actual leverage and rejects Transpower's preferred forecast leverage then Transpower suggest options. They are in the PwC report (second preference) and Guthrie paper (third and last preference). All would require the Commission first to accept that the regulatory purposes are better served by a regime that departs from market average derived indications of competitive optimisation. They would require the Commission to allow monopolist firms to take compensation from their consumers for their particular financing choices (made as monopolists with fewer disciplines than companies in competitive markets). The papers do not establish reasons for this that go much beyond different ways of saying that the alternatives are tougher on the monopolist.

3.29 All Transpower's promoted alternatives would offer gains to Transpower. MEUG submits that they are all windfalls from the acknowledged leverage anomaly. The Commission should draw lessons from the energy that has gone into promoting the Transpower alternatives. It should resolve to rebut the misperceptions in them about the role of the input methodology. There is no need to be defensive about not using actual supplier parameters. The methodology demands estimation of the position of a synthetic competitive supplier.

3.30 The Transpower advocacy is an early maturing of the risk courted in partially preserving the leverage anomaly in the SB-L CAPM. The misguided concession represented by that preservation has tempted suppliers to try to form it into a negation of the regulatory scheme. The Commission should now "shut the gate" on any opportunity for regulated suppliers to exploit the leverage anomaly by adopting the optimal leverage position.

[14] Page 37 of PwC report.

4 Transpower's Preferred Option: Average Forward-Looking Actual Leverage Without Further Adjustments

4.1 Transpower argue that the leverage applied in the Commission's SB-L CAPM should be Transpower's forecast leverage. This is Transpower's first and preferred option. In the view of Transpower any regulated leverage other than actual forecast leverage will be a poor outcome because:

(a) Their leverage is linked to the "transformational capital investment programme" (paragraph 10); and

(b) It will be contrary to the section 52A(1)(a) requirement for incentives to invest.

4.2 The Electricity Commission prior to being disestablished at the end of October 2010 had approved most of the major grid upgrade work. Processes are now in place for managing and approving minor capital within Transpower without recourse to the Commission subject to annual caps on total spending. Only yet-to-be submitted major capital items need Commission approval.

4.3 MEUG's prospective estimate of Transpower's Regulatory Asset Base is $4,901.6 million (refer to Appendix A). This comprises the current assets and approved assets most of which are under construction. Irrespective of decisions on leverage and hence effect on WACC, those assets have been or will be built. They are in effect "sunk investments".

4.4 Future uncommitted major capital work is listed on the Commission's website.[15] The sum of potential capital proposals under development of $409 millon plus grid upgrade proposals currently being reviewed by the Commission of $146.78 million equals $555.78 million. This is the magnitude of possible new investment that **might** require incentives to invest to achieve approval by the Transpower Board. The indicative approval dates for these capital items range between May 2012 and 2015 and commissioning dates after that date. Compared to prior years when capital expenditure approvals in excess of half a billion dollars per annum were common, the outlook for residual major capital approval requests is less than $150 million per annum on average.

"Transformational capital investment" is already committed

4.5 Transpower say at paragraph 10 of its submission that the incentive to innovate and invest is particularly relevant to Transpower due to its "transformational capital investment program". But any incentive can only affect capital not *already* committed. MEUG have previously argued that any incentive margin or generosity factor, whether in the notional leverage or any other factor related to leverage, should apply only to benefit new investment. Generosity as an

[15] Refer to http://www.comcom.govt.nz/transpower-major-capital-proposal/

incentive margin on leverage (or anything else) serves no statutory purpose when allowed on sunk capital.

4.6 MEUG submits that if the Commission remains minded to incentivize investment with what it calls "generosity" it should expressly confine the generosity with measures that ensure it does not conflict with the other statutory purposes, including to limit the extraction of excess profits from consumers and to share efficiency gains with them. That would be best served by the "two-tier" approach previously urged by MEUG. Though it would be odd to apply a two tier approach only to the leverage parameter, the Commission should examine the result of any generosity in leverage, for example allowing the near 'actual' leverage Transpower seeks, and decide whether it should apply only on condition that there is a corresponding adjustment to confine it to the statutory purpose (and the purpose advanced by Transpower – namely to incentivise investment). Axiomatically sunk investment cannot be incentivised.

4.7 Though Transpower's submission in favour of incentive generosity is made in relation to leverage, MEUG submits that the Commission is competent to look at compensating adjustments needed if the submission is accepted. For example, the Commission might indicate that it will use the opportunity given by the merit review process to submit in the appeals that the generosity in the WACC range point (from the midpoint to the 75th percentile) be qualified to apply only to new investment. Generosity in the estimation of parameters for the CB-L CAPM (including leverage) justified by concern about new investment alone, is not novel in regulatory terms. The two tier approach is applied in Germany to limit the risks from the incentive. We attach copies of material describing the application of the two-tier approach in Germany.[16] Note that the margin between the incentive return on equity (for new investments and sunk capital) set out on page 8 of the RWE Fact book is 1.73% points.

4.8 The difference between the 50th and 75th percentile cost of capital has tended to be in the order of 0.70% on the WACC. The effect of changing from the 50th to the 75th percentile is not expected to have a material impact on leverage, but does have a material impact on the base WACC.

4.9 Table 1 considers a 0.70% adjustment to Transpower's actual leverage (no adjustments) submission and the optimal leverage recommendation by MEUG for sunk investments and potential new investment:

[16] RWE publication appended.

Table 1: comparison of Transpower and MEUG submitted leverages

Leverage case	**Transpower's submission**			**MEUG's submission**		
	Actual L (no adjustments)			**L=neutral**		
L	**66%**			**0%**		
βa	**0.34**			**0.28**		
50th percentile WACC	6.85%			5.32%		
Assumed difference	0.70%			0.70%		
75th percentile WACC	7.55%			6.02%		
Transpower asset base and potential investments	Sunk $4.90b	Potential $0.56b	Total $5.46b	Sunk $4.90b	Potential $0.56b	Total $5.46b
Pre-tax capital charges $m pa						
• 50th percentile WACC	469	53	522	364	41	405
• 75th percentile WACC	517	59	575	412	47	459
• Difference	48	5	53	48	5	53
Difference as $m NPV (7 years) discounted at 50th percentile WACC	260	29	289	274	31	305

(a) For both leverage cases the shift from the 50th to 75th percentile increases pre-tax capital charges by $53 million per year comprising $48 million per year for sunk assets and $5 million per year for potential new investments. The $5 million per year capital charges for potential new investment (shaded green) is in effect the premium consistent with the purpose of part section 52A(1)(a) for incentives to invest.[17]

(b) However the $48 million additional pre-tax capital charge for sunk investment (shaded pink) is not needed as an incentive to invest. The same applied in both leverage cases.

(c) While there is no difference between leverage cases for the incremental annual pre-tax capital charges between the 50th and 75th percentile; there is a difference when these annual charges are converted to net present value ("NPV"). A lower WACC (for example when optimal leverage is applied) results in a higher NPV and vice versa. Consistent with the annual differences explained in the prior paragraph, the NPV differences in pre-tax capital charges comprise:

(i) The premium for incentives to invest in the potential future investments of $555.78 million represented by the increment between the 50th and 75th percentile WACC ranges equals in NPV terms between $29 million and $31 million depending on leverage case; and

(ii) For sunk investments the increment between the 50th and 75th percentile WACC ranges between $260 million and $274 million depending on the

[17] Purpose of Part, section 52A Commerce Act 1986

leverage case. This NPV increment is not required to incentivise investment by Transpower in the $4.9 billion of already sunk investment.

Higher Borrowing Costs are Unlikely

4.10 Transpower claims that an "*underestimation of its regulatory cost of capital will have negative effects on its capital raising initiatives and hence its ability to fund its investment in the national grid*".[18] That is not substantiated by evidence.

4.11 The PwC report states at page 12:

> *"This [imposed regulated leverage was less than actual leverage] … would also likely be viewed unfavourably in the debt markets and by rating agencies. A consequence of this could be that Transpower would face higher borrowing costs."*

This statement is puzzling. It seems to assume that the effect of a constraint on leverage for the purposes of the regulatory SB-L CAPM would feed through to be a constraint on Transpower's actual leverage. If so that would seem likely to have the opposite effect. PwC's fear seems contrary to the usual view that as leverage decreases, so does the risk to lenders.

There are measurement problems in deciding "actual" forecast leverage

4.12 Defining forward-looking, "actual" leverage is a complex process which raises difficult issues. For example:

(a) Transpower's SCI is based on book value of assets, not RAB, meaning that if the Commission accepts the SCI forecast for the leverage, it will be applying a leverage assessed against book values of a pool of assets that is not necessary the same as the RAB asset pool, and using this to calculate a WACC to be applied to the RAB.

(b) Allocation of debt to non/regulated assets in conglomerates. Although this may not be difficult for Transpower, the Transpower decision will unavoidably have precedent effects. Companies such as Powerco and Vector have significant non regulated businesses. Assuming one of Transpower's preferences for actual leverage is accepted by the Commission, consistency alone could see it eventually applied to input methodologies across other regulated industries. The Commission would need to determine an analytical approach to calculate how leverage would be allocated across business activities. For example, in the case of airports, how would the Commission determine what borrowing and equity proportion is for specified airport services and for non regulated activities? MEUG understand that some airport comparator companies have positive gearing (i.e. negative leverage) – how would this be applied using Transpower's submission on leverage?

[18] Transpower submission, paragraph 15

(c) Based on advice of PwC, Transpower considers the book value of the equity provides a reasonable estimate of "market value". Transpower determines a commercial value each year and this is published in the Statement of Corporate Intent. For 2010 and 2011 the value was $1.6 billion based on a sum of the parts approach[19] (it also revealed that the discounted cash flow ("DCF") values of $1.8 billion for 2010 and was $2.0 billion for 2011). It is not clear which assumption is a reasonable proxy for the market value.

(d) The Transpower 2011 commercial value of $1.6 billion was determined after deducting deferred tax of $155 million. This seems unusual given the assumption that Transpower is a "going concern" business. A further unstated assumption is what cost of capital/discount rates have been used in its DCF valuations. For instance is it the 50th or the 75th percentile cost of capital determined by the Commission?

4.13 Each year the Crown Ownership Monitoring Unit of the Treasury commissions market values of the SOEs including Transpower. For 2011 First New Zealand Capital valued the equity of Transpower at $1.7 billion based on a DCF approach. Forsyth Barr valued the equity at $2.2 billion also based on DCF approach including an 8% discount. COMU subsequently reversed this discount and adjusted the valuation to $2.4 billion.

4.14 Cameron Partners submitted for Transpower[20] that the market value of equity exceeds the book value.[21] Cameron Partners based its view on the observed Regulatory Asset Base multiples and concluded that the range for Transpower was 1.20 times to 1.35 times. The RAB premium therefore is equivalent to between $0.5 and $0.9 billion based on the RAB of $2.6 billion (average of 2010 and 2011). It is notable that Transpower's RAB is net of Capital Work in Progress of $0.6 billion (average of 2010 and 2011) and, as capital expenditure programme is completed, the RAB will be increased materially.

4.15 To illustrate the effect of including the RAB premium of $0.5 billion (based on the low multiple of 1.2), "the average forward looking actual leverage" for Transpower decreases by 6% from 66% to 60%.

4.16 MEUG submits that the measurement problems alone in selecting and verifying actual leverage make that an undesirable regulatory base.

[19] Refer to page 13 of Transpower's Statement of Corporate Intent 2011-2012:
"This estimate is a "sum of the parts" valuation based on a combination of two alternative valuation methodologies: (a) discounted cash flow (DCF) estimates based on the forecast future cash flows set out in Transpower's 10 year business plan; and (b) book value."

[20] August 2010.

[21] Refer to footnote 939 in the December reasons.

Changes in Leverage make material differences to WACC

4.17 Transpower and the Guthrie paper downplay the risk of Transpower exploiting perverse incentives to increase leverage to obtain a higher permitted WACC with two arguments: first that the changes in WACC caused by changes to leverage are insignificant, and second, that it would be irrational for Transpower to increase leverage to take advantage of the increase in regulatory WACC, because it would also impose an increase in the "actual" WACC.

4.18 Transpower submits that it has a weak incentive to exploit the leverage anomaly of the SB-L CAPM by increasing its leverage to above an efficient level, stating at paragraph 22.1[22]:

> *"regulatory and market constraints that are unique to Transpower mean that there is no realistic prospect of Transpower seeking to increase its leverage above an efficient level in order to obtain a higher regulatory WACC. These practical constraints have been previously discussed by Castalia in its advice to Transpower. Given those constraints, substantial evidence of the risk of "gaming" would be required to justify deliberating [sic] setting leverage values at a levels that will systematically under-estimate Transpower's WACC. There is no such evidence because there is no such risk*"

4.19 The 2009 Castalia report explains that Transpower is only limited to a prudent *range* of leverage. Gaming is still a problem within that range. History since 2009, as detailed below, undermines reasoning that the SCI process and approval by shareholding Ministers restricts Transpower's ability to adjust its leverage. The PwC report and Guthrie paper make that argument when opposing MEUG's optimal leverage proposal.

4.20 The PwC report and Guthrie paper argue that when Transpower's leverage is already at (or forecast to be) 71%, Transpower is unlikely to push it higher because it must stay within prudent limits. This argument does not deal with the significant increases to WACC that is produced by the anomaly in the formula, from increasing the leverage parameter from 44% to 71%.

Potential exploitation of Leverage Anomaly

4.21 Transpower has reviewed its capital structure and dividend policies since the Commission's December (2010) decision. The anticipated financing of the business and its leverage have radically changed. The timeline can be summarised as follows:

Date	**Position**
First half 2010	Transpower released its SCI for 2010/11. The SCI indicated that while the major capital reinvestment program was underway, Transmission's gearing would remain between 40% – 60% and dividends to the Crown would be suspended.

[22] Castalia Strategic Advisors, *Commerce Commission – Cost of Capital Workshop Cross Submission on Behalf of Transpower,* (2 December 2009), ("the 2009 Castalia report")

	The SCI stated (at page 4): *The relatively improved conditions in international credit markets following the global financial crisis mean that Transpower is unlikely to face any restrictions in its access to the capital necessary to fund its investment programme. However, the cost of funds has increased markedly. To ensure continued access to capital and minimise the cost of funds, preservation of a sound credit rating (currently AA) is a priority. To meet this objective, it is planned to keep gearing in the range 40%-60% over the investment cycle, and below 60% at all times. The suspension of dividends to the Crown remains a key part of Transpower's capital management during this period of heavy investment*
November 2010	Transpower supplied a copy of its "Note on Transpower's Treasury Practices" to the Commission. This note stated (at 21.2): *If the current parameters are maintained in the final determination and apply for the remaining three years of the RCP there would be negative pressure on Transpower's rating and outlook.*
December 2010	Commission's input methodology determination (the December decision)
23 March 2011	Transpower announced that was reviewing its capital structure and dividend policy.
5 July 2011	Transpower released its new capital structure and dividend policy. It intended to resume dividend payments of $695 million to the Crown over the following 3 years. The payment of dividends would cause debt to increase by $1.667 billion and Transpower's net equity to reduce by $77m. Leverage was forecast to increase up to 71% by the end of the regulatory period.
5 July 2011	Moody's cut credit rating on dividend resumption.
3 October 2011	Standard & Poor's long term corporate debt rating downgraded from AA to AA- as a consequence of New Zealand Government downgrade. Standard & Poor's confirmed the outlook as stable despite … proceedings despite the Commission's decision, the changed capital structure and dividend policies and the uncertainty of the merit review and judicial review proceedings.

4.22 The increase in leverage from 51% in 2010 to 71% in 2014 is a change of 20%. This change, if forecast leverage is reached, would result in a regulatory WACC increase of 0.37% per annum for the regulatory period, with a corresponding rise in prices to consumers of $25 million per annum.

4.23 The significant increase would be due entirely to the leverage anomaly. There is no evidence that Transpower's actual cost of capital would rise with leverage correspondingly. The only change has been to Transpower's financing and dividend policies; the operations and assets of the business remain the same. And, as discussed above, even if that were not the case, and the increased leverage had increased the company's actual WACC, that is not a matter for which the methodology should compensate Transpower.

4.24 Transpower asserts that its credit rating will be at risk if its regulatory WACC does not rise with its planned leverage hike. Transpower offers no evidence to support it. It is not consistent with orthodox CAPM, or the observed wide range of leverages for firms with similar asset betas.[23] The link between Transpower's credit rating and that of the New Zealand government also supports caution about accepting this unsupported assertion.

5 Option Two: Average Forward-Looking Actual Leverage with non-zero Debt Beta

5.1 PwC proposes using Transpower's "actual" leverage with a debt beta. In both the June and December reasons the Commission dismissed the use of the debt beta.

5.2 Inconsistencies which undermine the PwC recommendation include:

(a) In the application of the Commission's deleveraging formula the debt beta should have been calculated for each sample company and averaged to maintain consistency with leverage and asset beta calculations;

(b) PwC started from an asset beta of 0.34 related to the June Reasons derived from a deleveraging process that assumed a zero debt beta;

(c) The debt margin of 2% + 0.35 issuance costs are maintained. These relate to BBB+ credit rating standard of the comparator sample and not Transpower which is rated AA- (the Commission records that an A rated margin is 1.59%)[24];

[23] Refer to figure 1, page 9 of Guthrie G. *Measurement Error and Regulated Firms' Allowed Rates of Return,* 14 August 2010.

[24] Refer to Paragraph H5.98, page 467 of December reasons.

(d) The decomposing of the cost of debt is interesting but in our view is too subjective, uncertain and complex to apply to Transpower or as a precedent in other Commission applications; and

(e) The problem with using the June Reasons mean asset beta of 0.34 is that it relates to a leverage of 42% (not 44%) and the mean asset beta of the enlarged sample is 0.28 and this relates to its leverage of 44%. Hence, combining inconsistent leverage and asset beta results in derived inconsistent debt betas and adjusted asset betas. The December Decision variables of the mean asset beta of 0.28 and leverage of 44% are consistent.

Problems with UK Competition Commission analysis

5.3 PwC's debt beta analysis relied on the UK Competition Commission approach but not in the context of the specific CAPM/WACC model[25]. The Commission[26] cited the UK Competition Commission's decision on airports as showing that the leverage-anomaly is not unique and can be ameliorated by an adoption of debt beta. However, a closer examination of the relationship between leverage and WACC in *Figure 5* of the UK Commission's decision (set out in Appendix C2) shows that PwC (and the Commission) may have misinterpreted the UK situation, for the following reasons:

(a) The CAPM is the classical version where there is a tax advantage for debt financing. WACC would be expected to decline with leverage for reasonable leverage levels.

(b) The left side bottom graph in Figure 5 shows the vanilla WACC which is expected to rise with leverage but once the interest tax deduction is accounted for, the post tax WACC will in fact fall with leverage for reasonable levels of leverage. The introduction of a positive debt beta and based on the examining the graphs produces a lower vanilla and hence lower post-tax WACC.

(c) The motivation for BAA's increased leverage (in BAA's case, its starting leverage of 34% more than doubled) was to improve the efficiency of its financing. This suggests that post-tax WACC decreases with leverage in the mind of BAA.

(d) The introduction of positive debt beta lowers WACC vanilla (line looks to be indifferent to leverage) and pre-tax WACC (which reduces with leverage).

(e) Based on the vanilla WACC graph assuming a positive debt beta produces a WACC which is indifferent to leverage. Once tax is introduced the post-tax WACC would be downward sloping.

[25] PwC report, page 34 and footnote 65.

[26] at paragraphs 6.6.7 and H3.14 of December reasons

(f) If an anomaly did exist the UK Competition Commission solution of introducing a debt beta seems not to have been fully appreciated by the Commission. Based on the apparent UK Competition Commission approach a positive debt beta reduced WACC relative to a zero debt beta.

(g) Given the assumption of tax neutrality the SB-L CAPM should be expected to be indifferent to leverage for reasonable debt levels, **not** rising.

5.4 This shows that it could be unsafe to rely upon the UK Competition Commission work as evidence of the usefulness of a debt beta calculation in the New Zealand context. MEUG believe that the Commission's reference to the UK work may have taken it out of context.

6 Option Three: Nominal Leverage using Weighted Average of Transpower's Actual Forecast Leverage and Comparator Firms

The Guthrie paper

6.1 The Guthrie paper argues for using Transpower's estimated leverage because:

(a) of all the Commission's considered approaches it is the only one where there is no risk of underestimating efficient leverage;

(b) the incentive effects on Transpower to use a higher than efficient leverage are economically insignificant; and

(c) it avoids the pitfalls of estimating a debt beta which plague PwC's option two.

6.2 If forecast actual leverage is not accepted, the Guthrie paper proposes a weighted average leverage being 50% of Transpower's forecast actual and 50% of the comparator firms' historic average leverage.

6.3 The problems with the Guthrie paper's claims about the measurement of an efficient leverage for Transpower have already been addressed in section 3 above. The Guthrie paper also errs in not recognising that the incentives to invest premium is the mark-up between the 50^{th} and 75^{th} percentile as outlined in paragraph 4.9 above.

6.4 The Guthrie paper's weighted average option appears to be offered as a "deal". It does not appear to be grounded in economic theory or principle. It presents this option as a "fix" to solve the perceived dilemma of the regulated leverage being lower than Transpower's forecast leverage rather than as a fix to the flaw in the model. It uses different leverage measurements (comparative firm historic leverage and Transpower forecast) and uses a crude 50:50 split rather than applying economic principles to determine the appropriate weighting methodology.

6.5 The Guthrie paper also suffers from the same problem as PwC's debt beta analysis by relying on BBB+ firms when Transpower's rating is higher.

Yours sincerely

Ralph Matthes
Executive Director

Appendix A: Transpower sunk investment calculation

A1 The analysis in this submission assumes:

- $4.901.6 million as sunk investment; and
- $555.8 million as potential new investment.

These assumptions are explained in this appendix.

Estimated sunk investment

A2 As stated in MEUG's *Submission on Pan Industry IM for cost of capital*[27] at paragraph 5

> *"Transpower Regulatory Asset Base is estimated as the sum of System Fixed Assets as at year ended 30 June 2009 (not including works in progress on the balance sheet) plus capital expenditure approved by the [Electricity Commission] to date excluding minor works approved that would have already been accounted for."*

A3 It appears that there is no publicly available information comparing capital approved by the Electricity Commission ("EC") or the Commission with work approved by the Transpower Board or delegated for approval to Transpower management.

A4 As a check against whether the estimate of $4.901 million, calculated almost two years ago, is still appropriate, the table below sums balance sheet capital assets at 30 June 2011 plus capital investment estimates disclosed in the 2011/2012 SCI[28] for the next three years:

Estimate	$m	$m
Statement of financial position as at 30 June 2011: Property, plant and equipment[29]		2,612
Forward committed:		
• SCI 2011/12 Budget	873	
• SCI 2012/13 Plan	868	
• SCI 2013/14 Plan	736	
• Subtotal	2,477	2,477
Total		5,089

[27] 13 August 2010.

[28] The SCI estimates in the table below are from section C. Page 4 of the SCI states "*Projected total capital expenditure including all upgrade and asset renewal works is set out in Section C."*

[29] Does not include capital work in progress at 30th June 2011 of $737.2m

A5 Transpower's Annual Report for year ended 30th June 2011 disclosed the following forward committed capital works on pages 5 and 6:

Capital programme	$m
North Island Grid Upgrade project	824
HVDC Pole 3 project	672
North Auckland and Northland project	473
Wairakei to Whakamaru Replacement Transmission Line project	141
Subtotal major projects	2,110
Other projects	300
Total capital programme	2,410

A6 Overall there is a reasonable correlation between the MEUG estimate in August 2010 that the RAB was expected to be $4,901.6 million and the above more recent estimate of $5,089 million. MEUG have continued to use $4.901.6 million in the analysis contained in this submission to assist the Commission in comparing materiality values with previous MEUG submissions since August 2010.

A7 MEUG note two additional points contained in the 2011/2012 SCI. Firstly Transpower are part way through a wave of capital works after which capital expenditure will be low. Incentives to invest are not needed for the current large wave of grid investment as they are already committed.

> *"Capital investment is planned to peak in 2011/12 and 2012/13 with expenditure of ca. 850million in each year. This is driven principally by the coincidence of expenditure on three major upgrade projects (the North Island Grid Upgrade between Whakamaru and South Auckland; a new High Voltage Direct Current Pole (Pole 3) to replace the existing Pole 1; and the North Auckland and Northland Project reinforcing supply through Auckland CBD to the north)."*[30]

A8 Secondly, the SCI comments on the merit review with respect to cost of capital but only in the context of the expected return. There is no mention of investments being withheld should the cost of capital change (p4):

> *"The nature of the regulatory regime for transmission (described above) is a crucial influence on Transpower's overall performance, particularly the return on regulated assets allowed by the Commerce Commission. The Commission's final decisions in December 2010 and March 2011 set the rate of return at 7.19% (post-tax, nominal). In Transpower's view, this figure is materially below Transpower's weighted average cost of capital (WACC). As a consequence,*

[30] Page 3.

Transpower has instigated an appeal of the Commission's decision under the process set out n the Commerce Act 1986. The financial performance measures (Section E) and other forecasts set out below reflect the 7.19% set by the Commerce Commission."[31]

Estimated potential new investment

A9 The estimate of new investment of $555.8 million is sourced from the Commission's website[32] detailed below:

Individual Major Capital proposals			
Potential Capital Proposals under development:			
Name	Estimated Cost ($millions)	Indicative Application Date	Indicative Approval Date
Upper South Island Grid Upgrade stage 1	$5	Jun-12	Sep-12
Timaru Substation Development	$8	Jul-12	Sep-12
Wilton 110 kV bus rationalisation	$10	Oct-12	Jan-13
Upper North Island Reactive Support	$60	Dec-12	Apr-13
Upper South Island Stage 2	TBA	Apr-13	Jul-13
Waitaki Transmission Development	$20	2013	2013
Lower North Island renewables	$135	2013	2013
HVDC pole 2 capacity upgrade	$151	2014	2014/15
BPE-WIL A reconductoring (WIL-JFD section)	$20	2015	2015
MEUG calculated subtotal	$409		
Grid upgrade proposals being reviewed by the Commission:			
Name	Proposed Cost ($millions)	Application Date	Indicative Approval Date
Otahuhu Substation Land Purchase	$6.78	16-Jun-11	Jun-12
Bunnythorpe Haywards A and B lines conductor replacement investment proposal	$130.50	13-Dec-11	May-12
Kawerau generation export enhancement investment proposal	$9.50	23-Dec-11	Apr-12
MEUG calculated subtotal	$146.78		
MEUG calculated sum of Potential Capital Proposals under development and Grid upgrade proposals being reviewed by the Commission	$555.78		

[31] Page 4.

[32] http://www.comcom.govt.nz/transpower-major-capital-proposal/

Appendix B: Comparison and materiality

B1 Table B1 should be read in conjunction with Table 6 in MEUG's 5 April submission. The Transpower variables are those in the table in paragraph 31 of the Transpower submission and contained in the PwC report and Guthrie paper. The MEUG variables remain unchanged from MEUG's 5 April submission. The materiality test is a comparison to the counterfactual of the December decision (variables highlighted in yellow).

Table B1: Materiality tests

Midpoint calculations	June decision	December decision	MEUG and Transpower Submissions (some rounding differences)	Materiality test (change in pre-tax transmission capital charges)
Transpower cases				
(1) Actual leverage (No adjustments) (per Guthrie)				
L			66%	
βa			0.34	
WACC			6.85%	+$25m pa
(2) Actual leverage and debt beta (per PwC)				
L			66%	
Ba			0.38	
WACC			6.74%	+$17m pa
(3) Weighted average Leverage (per Guthrie)				
L			55%	
βa			0.34	
WACC			6.67%	+$12m pa
L	40%	44%		
βa	0.34	0.34		Base case
WACC	6.50%	6.48%		
MEUG cases				
(1) Consistency				
L			44%	
βa			0.28	
WACC			6.06%	-$29m pa
(2) National Grid				
L			48%	
βa			0.24	
WACC			5.84%	-$44m pa
(3) L=0				
L			0%	
βa			0.28	
WACC			5.32%	-$80m pa

B2 Table B2 summarises the materiality of each case relative to the input methodology decision counterfactual over seven years in NPV terms. Seven years is the maximum time before an input methodology must be reviewed.

Table B2: Materiality tests using NPV

Case	**Materiality test (change in pre-tax transmission capital charges) compared to the counterfactual**	
	$m pa	NPV ($m) over 7 years
Transpower cases		
1. Actual leverage (No adjustments)	+$25m	+136m
2. Actual leverage and debt beta	+$17m	+95m
3. Weighted average Leverage	+$12m	+69m
IM Decision, December 2010	Counterfactual	
MEUG cases		
1. Consistency	-$29m	-162m
2. National Grid	-$44m	-247m
3. L=0	-$80m	-455m

Appendix C: Detailed Calculations

C1 Table C1 details calculations used by MEUG to replicate and compare alternatives to the December decision and the three Transpower suggested cases. As noted in the 5 April submission, MEUG cannot exactly replicate the December decision so there is a small rounding difference in the table.

Table C1: Comparisons of Transpower cases and sensitivity

		Decisions		**Transpower cases**				**Sensitivity**
		Jun-10	Dec-10	**no adj. TP**	**highest L TP**	**with Bd PwC**	**Ave L Guthrie**	
		Draft Reasons	**Final** Reasons	**Final** Reasons	**Final** Reasons	**Final** Reasons	**Final** Reasons	Bd=.08 Ba=0.28
Inputs								
Risk Free	Rf	5.00%	**4.64%**	4.64%	4.64%	4.64%	4.64%	**4.64%**
Debt premium	Dp	**1.80%**	**2.35%**	2.35%	2.35%	2.35%	2.35%	**2.35%**
Leverage	L	40%	**44%**	**66%**	**71%**	**66%**	**55%**	**44%**
Asset beta	Ba	0.34	**0.34**	0.34	0.34	**0.38**	0.34	**0.316**
Debt beta	Bd	0.00	**0.00**	0.00	0.00	**0.08**	0.00	**0.080**
Market risk Premium	TAMRP	7.0%	**7.1%**	7.1%	7.1%	7.1%	7.1%	**7.1%**
Corporate Tax	Tc	28.0%	**28.4%**	28.4%	28.4%	28.4%	28.4%	**28.4%**
Investor Tax	Ti	28.0%	**28.2%**	28.2%	28.2%	28.2%	28.2%	**28.2%**
Calculations								
Be		0.57	**0.61**	1.00	1.17	0.95	0.76	**0.50**
Ke		7.57%	**7.64%**	10.43%	11.66%	10.10%	8.70%	**6.89%**
Results								
WACC (50th percentile)		**6.50%**	**6.48%**	**6.85%**	**6.93%**	**6.74%**	**6.67%**	**6.06%**
Relative to Final WACC		0.02%	[rounding]	0.37%	0.45%	0.25%	0.18%	

C2 In addition to the Transpower cases, MEUG suggested three cases in the submission phase. The table below incorporates and derives a cost of capital for those cases and as well as other comparative analyses to assist the Commission's understanding.

Table C2: MEUG cases and sensitivity

	Decision	**MEUG cases and other sensitivities**							
	Dec-10	MEUG Consistency		National grid	MEUG L=0				
	Final	L=44%	L=0%	L=48%	L=0%	L=66%	L=66%	L=71%	L=71%
	Reasons	Ba=0.28	Ba=0.34	Ba=0.24	Ba=0.28	Ba=0.28	Ba=0.34	Ba=0.34	Ba=0.28
Inputs									
Risk Free	**4.64%**	4.64%	4.64%	4.64%	4.64%	4.64%	4.64%	4.64%	4.64%
Debt premium	**2.35%**	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%
Leverage	**44%**	44%	0%	48%	0%	66%	66%	71%	71%
Asset beta	**0.34**	0.28	0.34	0.24	0.28	0.28	0.34	0.34	0.28
Debt beta	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Market risk Premium	**7.1%**	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%
Corporate Tax	**28.4%**	28.4%	28.4%	28.4%	28.4%	28.4%	28.4%	28.4%	28.4%
Investor Tax	**28.2%**	28.2%	28.2%	28.2%	28.2%	28.2%	28.2%	28.2%	28.2%
Calculations									
Be	**0.61**	0.50	0.34	0.46	0.28	0.82	1.00	1.17	0.97
Ke	**7.64%**	6.88%	5.75%	6.61%	5.32%	9.18%	10.43%	11.66%	10.19%
Results									
WACC (50th percentile)	**6.48%**	**6.06%**	**5.75%**	**5.84%**	**5.32%**	**6.42%**	**6.85%**	**6.93%**	**6.51%**
Relative to Final WACC	rounding	-0.43%	-0.74%	-0.64%	-1.16%	-0.06%	0.37%	0.45%	0.03%