MAJOR ELECTRICITY USERS' GROUP

13 June 2007

Ms Laurie Dupont
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Electricity Commission
By email to laurie.dupont@electricitycomission.govt.nz

Dear Laurie

Answer to question asked of MEUG at the Electricity Commission conference on the Intention to approve the Initial Grid Upgrade Plan

1. At the Electricity Commission (the "Commission") conference on the Initial Grid Upgrade Plan (GUP) on 22 May 2007, Commissioner Dell asked a question of the Major Electricity Users' group (MEUG) that we couldn't provide a full answer for at the time. This letter is in response to a Commission email request of 8 June for a written answer.

2. The question asked of MEUG at the conference follows:

> "On page 2[1], there is a statement relating to the difference in cost between the 400kV option and the 220kV option, and right at the end of the page it says: "Arguably if the choice is between 400kV and 220kV, the incremental unit charge" that is arising out of transmission investment "will be some fraction of the above estimated costs" implying the 220 incremental charge would be lower.
>
> The fact is, however, that all the Commission's derivations have shown the 220kV option to be more expensive and had we had to decide a figure to be added to the asset base of Transpower for the 220kV option on the grounds of our assessment or the majority anyway, there would have been a higher figure go into that asset base which could then relate to real charges to consumers.
>
> I don't know whether I'm asking a question or whether I'm making a statement but don't you believe that that statement is incorrect?"

3. The analysis that follows assumes the question can be restated:

> Will transmission charges for the 400 kV option compared to the 220 kV option be lower (the view of Commissioner Dell) or higher (implied by the MEUG submission of 30 March 2007)?

[1] Refer MEUG to Electricity Commission, *Submission on Electricity Commission Reasoning in relation to intention to approve North Island Grid Upgrade Plan proposed 400 kV capable line*, 30 March 2007.

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4. The analysis that follows is based on three assumptions:

   a) Only costs that will accrue in transmission charges are considered, namely capital works, property costs and operating and maintenance costs. Other costs and benefits assumed in the Grid Investment Test (GIT) are excluded, eg net transmission losses.

   b) The analysis does not include an assessment of the risk of consenting and access delays or the possibility of a consenting decision declining an option relative to the other option.

   c) The data used is sourced from the Commission and therefore Commission assumptions regarding timing and need for assets beyond those the Commission intend to approve underlie the results. The use of this data should not be viewed as acceptance by MEUG of those assumptions, eg whether or not there is a need for a second 400 kV line within the analysis timeframe.

   d) There is insufficient public domain information and or expertise within MEUG to test the sensitivity of the results of the analysis in this letter.

5. Two sources of data have been used to answer the question. First, the "Decision results" set out in the Commission "Reasons for Decision" report of 23 February 2007[2].

6. Second, a MEUG back-of-the-envelope spreadsheet based on Commission data[3]. The spreadsheet is titled "MEUGCostSumamry – MEUGmodified12Jun07.xls" and a copy is attached. The data and results from this spreadsheet are called the ".xls results."

7. Using the Decision results the 220 kV option gives the lowest NPV for transmission charges. There are a two caveats to this result:

   a) Terminal values are excluded because those have not been published in a disaggregated form to allow separation into either transmission charges or other benefits and costs relevant to the GIT.

   b) The NPV difference in favour of the 220 kV option is not material being $1m or 0.1% lower than the 400 kV option.

8. Using the .xls results analysis there are 3 results of interest:

   a) Cumulative spend on capital works and property until the end of 2013 is expected to total $776m for the 400 kV option and $706m for the 220 kV option, ie a 9% difference in cumulative spend to that date. In 2014 these costs will first come to charge as the line is enlivened. Assuming the transmission pricing methodology will result in charges being approximately in proportion to the costs added to the asset base, then as at 2014 consumers will pay transmission charges for the upgrade that will be 9% higher if a 400 kV option is built compared to a 220 kV option.

      Consumers will continue to pay higher transmission costs for the 400 kV option relative to the 200 kV option until such time as further capital works are spent on the 220 kV option around 2032 (in some scenarios this will never happen), at which point the transmission charges for the 400 kV option become lower. This longer-term switch from the 220 kV option to the 400 kV option having the lowest transmission depends on various assumptions about the future that are controversial, eg whether a second 400 kV line will also be needed.

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[2] Electricity Commission, *Reasons for Decision set out in Notice of Intention to Approve Transpower's North Island Grid Upgrade Proposal*, 23 February 2007

[3] The original spreadsheet was provided by the Commission to MEUG on 22 March 2007 to assist understand the analysis given parties such as MEUG do not have the expertise to examine or replicate the detailed Monte Carlo and other complex analysis conducted by Transpower and the Commission.

b) The NPV of the costs that will accrue into transmission charges of the capital works and property costs to be approved (ie up to and including 2013) plus ongoing operating and maintenance costs totals $479m for the 400 kV option and $435m for the 220 kV option, ie the 220 kV option will have, in NPV terms, transmission charges 9% lower than the approved works for the 400 kV option.

c) The NPV of the costs that will accrue into transmission charges of:

i) The capital works and property costs to be approved (ie up to 2013) and ongoing operating and maintenance costs (ie the costs from 7.b) above); plus

ii) The capital, property costs and related operating and maintenance costs of work yet to be considered and approved (beyond 2014 through to 2042).

In this case the 400 kV option has the lowest NPV for transmission charges of $716.81m versus $716.83m for the 220 kV option. The difference in favour of the 400 kV option of $0.11m or 0.02% is negligible. This result is consistent with the full GIT analysis where the options were relatively comparable except the 440 kV option had slightly higher non-transmission charge benefits of transmission losses and terminal value benefits to tip the GIT evaluation.

9. In conclusion the answer to the question raised at the Commission conference is:

a) Transmission charges for the 400 kV option will initially be higher when the line is first enlivened in 2014 compared to the 220 kV option. The difference is likely to be material, ie 9%;

b) Consistent with the above finding, the NPV of transmission charges for the approved works (to 2013) and related ongoing costs for the 400 kV option will be more expensive by 9% compared to the 200 kV option;

c) Over a very long timeframe the Commission GIT derived transmission charges and a back of the envelope analysis using simplified Commission data both show little difference between the 400 kV and 220 kV options.

10. Overall consumers will have higher transmission charges in the near and medium term (for almost the next three decades to 2032) for the 400 kV option compared to the 220 kV option. Over the much longer term the Commission analysis shows little difference in transmission charges between the two options, although there are significant points of difference between the view of the majority of the Commissioners and MEUG (and others) about what assumptions should be used to describe the most likely longer-term future and hence the relative economics and resulting transmission charges for the 400 kV and 220 kV options.

Yours sincerely

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