

To
Jenny Walton
Electricity Commission
Level 7, ASB Bank Tower
2 Hunter Street
PO Box 10041
Wellington 6036

Submission on Transpower's revised proposal
From Dr Laura Bennet and Mr Adrian Kinsler

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Clevedon
Auckland

Dear Jenny

Below we detail our submission on the current Transpower proposal for the grid upgrade to Auckland.

We believe the Electricity commission should not agree to the Transpower's proposed tall pylon 400Kv proposal. We believe that the EC should be taking a broader view of the electricity supply issue and needs time to work with the government, stakeholders and the public to achieve this. The EC should be taking a leading role in addressing the nations electricity needs as a whole, evaluating generation, transmission, and usage as a package to ensure that our strategy to ensure a secure electricity supply for the next 100 years is both intelligent and fundamentally sound.

In accordance with the Resource Management Act, any plan should take into account environmental, social, cultural and financial costs. The current proposal does not provide a good or reliable solution and does pose significant RMA challenges which the public will act upon because of the nature of the tall pylons. Upgrading existing transmission lines with modern materials and reconductoring would secure Auckland's power supply in the medium term to consider a more strategic long-term plan.

Regarding the current proposal we reject the current proposal to accept Transpowers 400Kv plan for the following reasons:

1. Confidence in cost differences. The Commission has adopted a default discount rate of 7% in the context of a 20-year future for analysis and with a second stage of investments for this upgrade projected to occur 40 years after the initial investment. We contend, as does the New Zealand Treasury(see:http://www.treasury.govt.nz/costbenefitanalysis/4.asp#P581_57374), that 7% is too low and does not provide for:
 - a. an adequate financial buffer to account for the potential changes in future costs.
 - b. Adequate risk protection for those who bear the risks of increased costs. This is not just Transpower, but those who pay for transmission services. It was not clear why the EC chose 7%, but it is assumed that this is done at the recommend Treasury rate of around 7% (7.5% in their documentation) to be

used for financial analysis at the level of the organisation. It is not a rate to be used for national analysis of net benefit.

The Treasury, in its Cost Benefit Analysis Primer, recommends 10% “whenever there is no other agreed sector discount rate for costing policy proposals.” Where there is an agreed sector discount rate then this can be used instead. At the meetings held by the EC, this question was raised on several occasions and the public were told that there was no agreed sector discount rate, but in using 7% this favoured Transpower’s proposal.

If the EC uses the Treasury recommended 10%, then the GIT of the current proposal fails and it cannot be recommended.

2. *Sensitivity analysis of the default discount rate.* There should be clarity on the sensitivity analysis which underpins the choice of discount rate; that is the assessment of those factors that require especially careful assessment or management.

According to Treasury “This analysis can address two key questions. Would the proposal still be worthwhile pursuing if some of the key assumptions do not eventuate? Are there actions that can be taken to reduce the risks before accepting a particular option? Sensitivity analysis can help in forecasting uncertainty and in assessing and treating project risks. The analysis should give a realistic picture of the extent to which the selected option is still worthwhile pursuing even if there are significant changes in key variables. The decision about which form of sensitivity analysis to undertake and the effort to invest should be made on a case-by-case basis, depending on the scale of the proposal, the degree of future uncertainty around key costs or benefits, and the risk tolerance of stakeholders.”

We contend that there has been inadequate sensitivity analysis of the current Transpower proposal. The proposal does not offer greater security, supply quality, cost improvements, or lower risks.

- a. There are viable alternatives to reduce risk which have not been adequately evaluated, or rejected by Transpower because they currently lack expertise. This is discussed further below.
- b. The issues of electricity supply **and** demand issues, yet these issues form a critical part of deciding on how to transmit electricity. Current Statement of Opportunities (SOO – draft 2007) data must be used. A plan which takes into account the northern growth of Auckland in terms of demand and therefore generation and transmission must be considered and appropriate least cost expansion principles applied where generation and transmission are co-optimised
- c. The project is no better “future proofed” against advances in technology than upgrading the current lines or utilising technology which would improve transmission using lower height pylons.
- d. The 400Kv proposal is not more secure. Failure of this line is just as likely, and may be more due to wind loading. The 400Kv and 200Kv costs, if one accepts N security following a double circuit failure, or duplicating the line have the same annualised costs. The N-1 option for energising the 400Kv seems to be **significantly more** expensive than line duplication.

- e. Costs are in part based on totally inadequate compensation costs for landowners who will have these pylons on their land, adjacent to their land or in the local vicinity (i.e in their general view), significantly reducing their property values. The collateral costs related to loss of tourism in regions such as Clevedon have not been assessed.
 - f. Risk of tolerance of stakeholders. We the public are stakeholders in this venture. We are not tolerant of tall pylons and will proceed under the RMA to the Environment court to object to this. This will lead to significant delays in developing a new transmission plan, and this factor must be taken into account when assessing costs.
3. Inadequate assessment has been made of upgrading the current 220Kv line and thus there is no true comparison of costs between the new 400Kv proposal and upgrading the current line. Examples of this include the use of modern conductors such as all aluminium alloy conductors on the existing line. Reconductoring (duplexing) current flat tops in the South Island is currently underway, but is not proposed for Auckland. The EC itself acknowledged in meetings and in its own documents that it has significant reservations about Transpower's assessment of these alternatives. This must be resolved before any decision is reached.

Duplexing the lines, and the use of modern conductors will significantly address our supply issues.

It is not clear that it is reasonable to assume costs of substations, cabling, voltage support and series capacitors are common to both the proposal and the 220Kv alternative.

Undergrounding has been deemed too expensive, and the use of DC somehow inappropriate. However, there has been no accurate assessment of the true economics and benefits, not to mention our compliance with the RMA. According to the ECs own rules, the cheapest option does not have to be the option decided on. Again the EC must take a leading role in making sure that a comprehensive electricity plan is implemented.

- a. There is inadequate assessment of and provision for the true costs of compensating affected landowners (including those who do not have pylons on their land, but whose land prices are affected by their presence). It is entirely unreasonable to consider it acceptable for one sector of the public to pay for another, and indeed to ensure the profits of a business.
- b. Operating and maintenance costs for cables are estimated to be around one tenth of the cost of aerial lines and as cables have lower electricity losses than aerial lines, when lifetime costs are taken into account, the cost multiples fall to be between 7 and 12 times.
- c. Electricity losses are less, which means we have to produce less to deliver the same. This surely is important in these carbon reduction times of ours.
- d. They provide for a more secure supply. The security of supply has been a key issue in moving forward on making a rapid decision on the new transmission plan. If we want a more secure supply, then undergrounding will provide that, and if canvassed, public and business are likely to agree worth the extra cost on bills which by experience from overseas users, where this option is being increasingly utilised in their new strategic planning, the cost is only likely to be

in the order of 1%, since transmission costs typically only form 5-10% of the total cost of electricity. It is worth the investment.

- e. There is potential to utilise space under motorways to run larger, more accessible tunnels, which have the capacity to have space to be on sold to other consumers such as telecommunications, cable companies etc.
4. Ormiston Road substation. Given the market rates of property in Auckland, there can be no risk associated with early procurement of a land corridor to protect access to the Ormiston Road Substation, thereby reducing the need for a second substation requiring longer cables at the time of the building of a second 220Kv line.

Once again, consideration must be made about procurement of land, and the implications of such land utilisation for overhead cabling within developing communities (as Auckland grows), and other issues which may affect long-term decisions to use overhead cables which shed a lot of electromagnetic energy. Overseas, increasingly it is being acknowledged that there are legitimate health issues surrounding EMF radiation and either that HVDC must be considered as an alternative or much larger easements (see the World Health Organisation on the subject of EMF and health. <http://www.who.int/peh-emf/en/>). There is no provision for procuring much larger easements, but overseas trends suggest that we should.

5. The proposal includes strategic benefits of an extension of a 400Kv system south of Whakamaru, and indeed for a 400Kv backbone grid plan. However, the apparent cost of energising a 400Kv line versus 220Kv is negated by the cost of transformers required at each end of the line. 400Kv is only more economic when the growth in power transfer is predicted to be high, or when the transfer distances are large. The economics of HVDC also improve with transfer distance in order to spread the cost of converter stations.

The data do not support a 400Kv NZ country grid. Thus the 400Kv line from Whakamaru to Auckland is likely to be orphan technology. Once again, it is a better and more strategic option to upgrade what we have while we work these details out. There are considerable questions about the modelling assumptions regarding the lead time for the commissioning date ahead of need date.

Opting for the 400Kv line, locks us into old fashioned technology for the next 100 years plus, and as suggested by the analysis of the transmission needs for New Zealand, an unnecessary.

We cannot support the current proposal, and request the EC look again at alternate proposals, and the issues raised by the affected landowners about the tall pylon 400KV proposal and the costs to them. These costs are significant and are financial, social, environmental and cultural. Surely we can do better in balancing the needs of Auckland against those who are affected by this proposal Surely we can do better at constructing a more strategic plan to generate, deliver and utilise electricity? Now is the time to truly think about the future and the EC needs to work with all parties to achieve this.

Laura Bennet, and Adrian Kinsler.