

12th March, 2007

Board of Inquiry
Upper North Island Grid Upgrade

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Updated Transpower Grid Upgrade Submission

The New Zealand Council for Infrastructure Development ¹ supports Transpower's notices of requirement for designations and applications for resource consents for its proposed transmission line from Whakamaru to Otahuhu and Pakuranga and requests the Board of Inquiry to approve the application, as submitted. NZCID would like to be heard in support of its submission.

NZCID considers this is a critical electricity transmission project that will ensure the growing need for electricity in the upper part of the North Island can be met. We concur with Transpower's analysis that the project needs to be commissioned prior to the winter of 2014, at the latest. Following an extensive consultation and approval process required by the Electricity Commission, and revision of the upgrade plan following detailed community consultation and risk assessment processes, there is now some urgency to the determination of the necessary designations and consents.

NZCID has undertaken a series of in-house workshops on this matter and has undertaken its own independent analysis of the issues to form its conclusion that this application should be approved. We offer the following reasons to substantiate this view.

¹ NZCID is a non profit organisation. Members comprise a diverse range of leading private and public organisations including infrastructure equity owners, financiers, constructors, service providers, public sector agencies, and major infrastructure users. Information on the Council, its members, policy and work can be found at www.nzcid.org.nz. In developing its policy position on infrastructure issues, NZCID consults extensively with its member organisations, undertakes workshops and seminars on policy and undertakes independent research. This submission represents the views of NZCID as a collective whole, and may not necessarily represent the views of individual member organisations, some of whom will be making their own individual submissions.

Need for certainty in electricity transmission capacity

Failure at Transpower's Otahuhu substation on June 12, 2006 highlighted the importance of connections at the Otahuhu substation and diversity of supply into Auckland. This was underlined in a draft Government Policy Statement on Electricity Governance released by the Government on 7 August 2006 and the need, as stated in the Minister's letter of 8 August 2006, *"for improved diversity of supply routes to major cities where practical"*.²

NZCID is concerned at ongoing uncertainty about security of electricity supply into Auckland and the consequential adverse impact that this is having on investor and business confidence both domestically and internationally. Companies making investment decisions seek certainty. The more significant the investment, the greater the need for confidence in energy supply in the medium to long term. In such circumstances, five, ten, or even 20 year horizons may not be sufficient. In the New Zealand context, concerns about inadequate infrastructure have been clearly demonstrated by business confidence surveys in recent years. The 2005 World Economic Forum global competitiveness executive opinion survey ranked inadequate supply of infrastructure as the most significant problematic factor for doing business in New Zealand. In the 2006 NZ Herald Mood of the Boardroom survey of 90 CEOs and directors of NZ's leading companies, 94% said they were concerned about the future of NZ's energy supply. The latest IMD Executive Opinion Survey rated New Zealand 4 out of 10 in terms of the adequacy of its energy infrastructure for an efficient economy and ranked the country 35th out of 36 nations with a GDP per capita greater than \$US10,000.³ Similarly, anecdotal feedback from NZ Trade and Industry staff note that the issue is a key concern often cited by potential international investors.

It is now some three years since the need for the upgrade path was first identified by Transpower. NZCID supports the position adopted by the Retail / Generator Line Company CEO Forum in their letter to the Electricity Commission dated 11 May 2006 which sought an outcome that will:

1. Provide assured security of supply to greater Auckland
2. Deal conclusively with any perceptions of a lack of security of supply
3. Ensure the grid has sufficient flexibility to enable competition
4. Achieve this sooner rather than later.

Providing certainty on the grid upgrade path is critical to delivering the Government's draft energy strategy which is reliant on getting distributed renewable hydro, geothermal and wind generation capacity to market via a robust transmission grid. Final determination of the upgrade path will encourage generation investment decisions, and will boost business and investment confidence generally. Certainty of direction is also critical for the communities directly affected by the upgrade path

² Hon David Parker, Minister of Energy, (7 August 2006), Draft August 2006, Government Policy Statement on Electricity Governance, 36pp

Minister of Energy Letter to the Chair of Transpower, 8 August 2006, Letter from the Minister of Energy to the Chair of Transpower regarding proposed amendments to Government Policy Statement on Electricity and Expectations Concerning Transpower's role, 1pp.

³ IMD WCY Executive Opinion Survey based on an index from 0 to 10 © IMD WORLD COMPETITIVENESS ONLINE

decision.

Generation alternatives do not replace the need for the transmission capacity

NZCID notes that objectors to the transmission grid upgrade argue that transmission might be replaced by generation capacity within or to the north of the Auckland region.

If new generation proposals are confirmed and built before 2010 they could possibly defer the new line for a year or two, but transmission capacity will still be needed to meet future electricity demand. Some of Auckland's future electricity demand may be met by building new generation plants in the region, but as yet there are no confirmed new generation projects that would defer the need for the proposed new line. While proposals were being advanced (such as Contact's Otahuhu C and Genesis's proposed Rodney power plant), these will be constrained by the Government's proposed moratorium of thermal energy generation currently before Parliament. NZCID considers that it is not realistic for Transpower, and the country, to "wait and see" what happens given the rapidly growing demand, and the six years it typically takes to gain approvals, design, and build a significant transmission upgrade project.

As noted above, generation companies have been strongly supportive of the completion of the transmission upgrade in order to provide certainty from a generation investment perspective. Indeed, Contact have deferred a commitment to proceed with the Otahuhu C thermal generation plant in favour of developing geothermal energy initiatives south of the proposed line. Investment in geothermal energy is consistent with the Government's draft Energy Strategy which places the emphasis on renewable electricity generation. Such generation is essentially dependent upon improved transmission capacity into Auckland.

The Electricity Commission's Grid Investment Test required Transpower to assess the economics of its proposals against other options and across a range of sensitivities. For the North Island Grid Upgrade Project (NIGUP), Transpower studied the possibility of a new 220 kV line initially, with another line around 15 years later. There were five generation scenarios used for the investigation and they all had varying degrees of generation in the Auckland and Northland areas. The analysis showed the NIGUP was consistently superior to this alternative across a range of sensitivities (including greater generation).

Moreover, transmission capacity enables competitive generation supply to and from regions. Reliance on distributed generation runs the risk of creating market dominant suppliers by region and risks reducing national market competitiveness and base load capacity. On the other hand, future additional generation capacity in Auckland linked to the national grid adds to national capacity thereby increasing the potential for competition.

For each of the reasons set out above NZCID does not consider regional generation capacity is a replacement for the transmission upgrade proposal.

Potential for 400kV upgrade reduces the longer term social and environmental impacts of a second 220kV line in the future

Opponents to the NIGUP proposal have argued for the provision of a 220kV line now with the potential to provide an additional 200kV line at a later stage as demand warrants. However, it is not clear whether a second 220 kV line would be built as it is likely that any additional 220 kV route will face significant challenges in the consenting and easement processes. Urban creep and urban landfill can be expected to make it more difficult to find sufficient land to build a second line. A new line will incur substantial financial cost as land prices rise and material and labour costs increase. By contrast, at a similar capacity, the 400kV constructed line, can increase voltage through installing transformers at the planned site at Brownhill Road.

In addition, upgrading the grid over time to a 400 kV voltage, provides an opportunity to replace lower capacity lines, where 220 kV development does not. For example, the proposal includes the removal of the old Arapuni to Pakuranga 110 kV line consisting of 460 towers and 147 route km of conductors.

While the public appetite for a reliable electricity supply is high, this does not equate to a hunger for new transmission lines. The 400kV development path responds to that concern by providing fewer lines over time than a 220 kV path.

Impacts of 200kV alternative are not dissimilar to proposed 200/400kV proposal

NZCID notes that one of the big misconceptions with the alternative 220 kV upgrade that some favour is that the pylons will be similar in size to those of the existing 220kV line. In reality the difference in effects between the proposal and the 220kV alternative will not be as significant as is commonly thought. The line design chosen for any new 220 kV option, which is intended to meet the intent of the Government Policy Statement (GPS) requirement for fewer corridors of high capacity, will result in higher tower heights – up to 58 metres – significantly higher than existing towers. This is illustrated in section 3.13 and Figure 11 on page 54 of Transpower's reply to the Electricity Commission dated 17 January 2007 (see extracted diagram below).⁴

⁴ See Electricity Commission website:

<http://www.electricitycommission.govt.nz/pdfs/opdev/transmis/Feb07-decision/Response-to-08Dec06-rfi.pdf>
<http://www.electricitycommission.govt.nz/pdfs/opdev/transmis/Feb07-decision/Response-to-20Dec06-rfi.pdf>



Figure 11 – Comparison of typical tower height suspension towers for 220kV, 220kV alternative, and 400kV Proposal typical tower heights (impression only)

- Existing OTA-WKM-C 220kV, Tower Contract: C385, Suspension Tower, Height: 36.1m
- Alternative 220kV, Tower Contract: New Suspension Tower, Height: 47.0m
- 400kV Proposal, Tower Contract: New, Suspension Tower, Height: 57.6m

The 220 KV alternative is a high capacity 220 kV line with the same number of conductors and conductor type, and similar span lengths to the 400 kV line. This results in towers that are much larger than the existing 220 kV Otahuhu-Whakamaru C line. Lower tower heights are possible but with a significant increase in the number of towers and therefore cost.

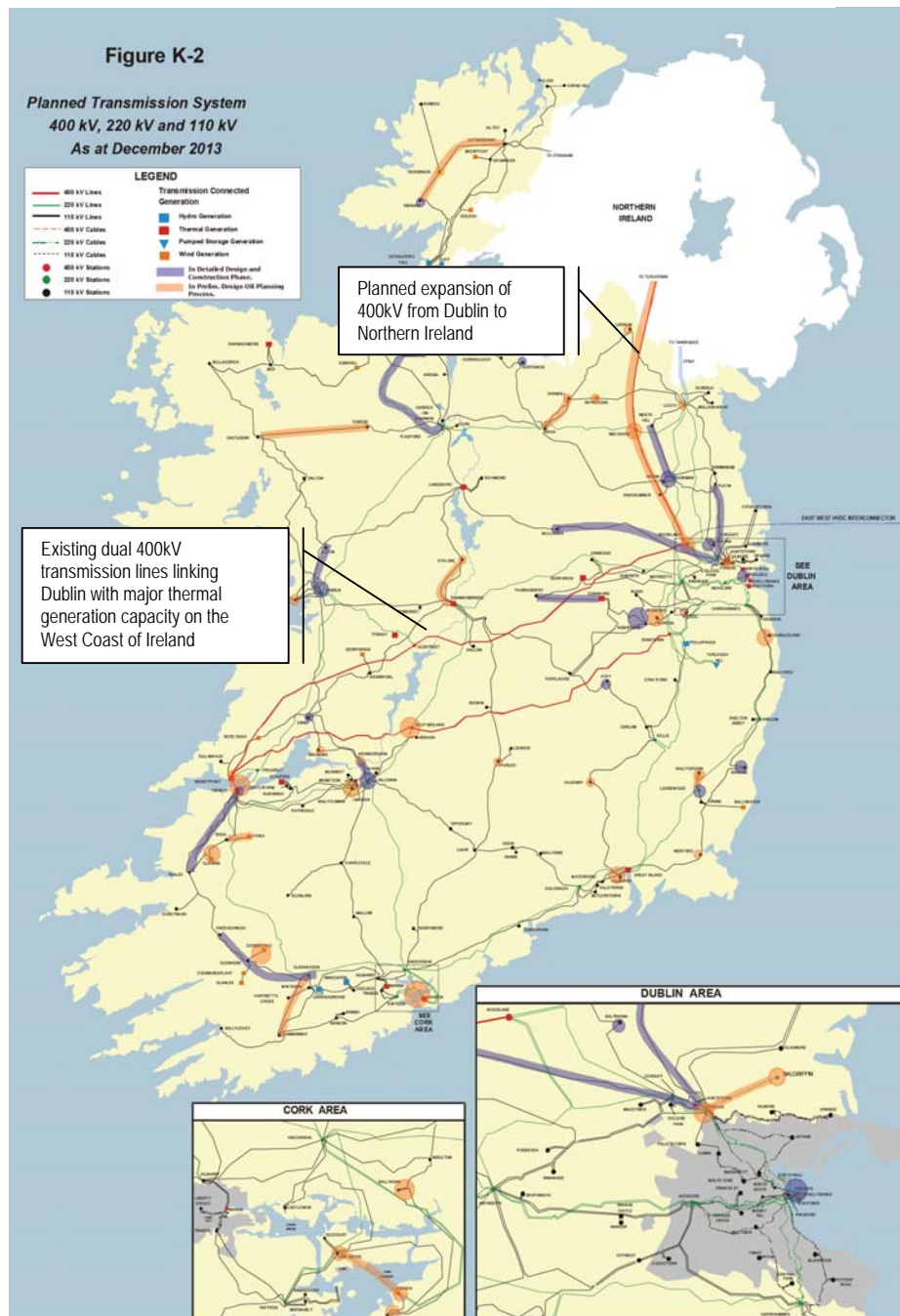
Transpower Proposal is Consistent with International Practise

Internationally, New Zealand is following a list of comparative nations that have already increased their backbone transmission voltage levels near or in excess of 400 kV. These include:

- UK, France, Ireland, Singapore (400 kV)
- Norway (420 kV)
- Japan, Australia (Victoria) (500 kV)

Ireland, with a comparative sized population to New Zealand, but a much smaller land mass, already has a dual 400kV circuit linking Dublin with major thermal generation at Moneypoint in the west and is now planning expansion of the 400 kV link from Dublin to Northern Ireland (see fig K-2).

Figure K-2 Ireland existing and proposed grid upgrade plan



By comparison with these countries, New Zealand's proposed grid upgrade is relatively modest.

Transpower has undertaken extensive analysis of alternatives

The RMA requires Transpower to have given '*adequate*' consideration to alternative sites routes and methods of undertaking the work for which it seeks approval.

There is no definition of adequate in the RMA, but case law indicates that the consideration of alternatives does not require the Board of Inquiry to assess the relative merits of alternatives and then to make a choice as the preferable alternative. Rather, the test is whether Transpower has carried out "*adequate investigation of alternatives*" so as to satisfy itself as to the alternative put forward.

The word adequate, in this case, does not mean "*meticulous*" or "*exhaustive*", it means "*sufficient*" or "*satisfactory*". Further, the case law would indicate that the Board need only be satisfied that Transpower has not acted arbitrarily or given only cursory consideration to alternatives.

The Board of Inquiry, if it finds that the adverse effects of the chosen alternative put forward (in this case a 200/400kV line in the location Transpower is proposing) are too great, or if it considers that Transpower's consideration of alternatives was not "*adequate*", can then decline the designation. It cannot however, direct another alternative to be chosen in its place. Transpower would then have to go back to the drawing board and put up another proposal if it wanted to continue. This would involve a new consultation process over a new route (up to 3 years), a new investment proposal (2 years to approve). In the meantime, Auckland's reliability of supply would be at risk.

NZCID draws the Board of Inquiry's attention to the detailed consultation process described in Part X Section 2: Consultation Report of the Notices of Requirement Documentation and Section 3: Report on the Evaluation of Risk. In particular, we note that information gained during the consultation and risk assessment process and the parallel environmental and engineering studies was fed back into the ongoing design process at Transpower. Regular meetings were held to consider new information and to accept or reject possible design responses. The meetings involved Transpower engineers, property experts and environmental managers, consultant planners, landscape architects, and other specialist advisors as required. Based on these inputs, adjustments were made to the proposed scheme. These resulted in about two thirds of the proposed towers locations being moved from their preliminary positions and practical and effective mitigation measures were identified to reduce all risks associated with the proposed upgrade to levels that are considered to be as low as reasonably practical.

In this case, not only has Transpower undertaken extensive analysis of alternative options, including environmental impact assessments, it has been required by the Electricity Commission to undertake

further extensive analysis of alternative options. The Electricity Commission has itself consulted widely and undertaken further evaluation of options and revised its plans accordingly.

NZCID considers the Board must conclude that Transpower has given “substantial” consideration to alternative sites, routes and methods of undertaking the work for which it seeks approval.

Conclusion

The development of national infrastructure almost inevitably requires making difficult trade-offs between social, environmental and economic pressures. Few infrastructural developments have greater impact or stimulate more community angst than transmission lines. Yet electricity supply is critical to the nation’s social and economic development. The case for increased transmission capacity into Auckland is irrefutable. The social and economic risks of further delay in determining the upgrade path are unacceptable. The upgrade proposal submitted by Transpower, as amended following substantial consultation and independent analysis and evaluation, achieves an appropriate balance between the competing social, environmental and economic trade-offs. Accordingly, the New Zealand Council for Infrastructure Development supports Transpower’s notices of requirement for designations and applications for resource consents for its proposed transmission line from Whakamaru to Otahuhu and Pakuranga and requests the Board of Inquiry to approve the application, as submitted.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Stephen Selwood', is written over a horizontal line.

Stephen Selwood
Chief Executive