Submission to the Electricity Commission on the draft decision on Transpower's Auckland 400kV grid investment proposal

From

Contact Energy

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Overview

Contact Energy appreciates the opportunity to provide comments on this consultation. Recognising that the context of the consultation has changed since its release, we have focussed our comments on our assessment of the process the Commission followed in applying the grid investment test and our suggestions for improvements. We begin with high-level comments, followed by specific areas of concern.

Contact believes that one of the most important things the grid investment test process can provide is certainty to market participants. The process should enable market participants to feel confident that:

- Transmission capacity will be sufficient for the country's future needs;
- Good industry practice has been followed;
- Grid security will be maintained;
- The selected option is feasible to construct and implement; and
- The ramifications on the daily operation of the grid are well understood.

From Contact's perspective, the grid investment test process as summarised in the consultation paper has not achieved this outcome. In our opinion, there are still a lot of questions concerning the capacity, security, and ramifications of the options analysed by the Commission. Instead of feeling confident about the process, Contact has found itself in a position of effectively having to choose which group of experts we believe – without even having had the ability to sit down with both groups in one room to constructively discuss the key issues.

Contact considers that industry participants should have had a chance to provide input into the analysis as it was occurring. Instead, we were asked to comment on the Commission's completed analysis. This meant that industry participants had a relatively short time to come to terms with a very large amount of technical papers and related information. It also meant that the resulting industry discussion, instead of being focussed on a defined problem, ranged from high-level concerns, such as those regarding sufficient capacity; to detailed questions, such as the feasibility of constructing a certain portion of the new transmission line. From Contact's perspective, it is not the technology *per se* that should be the focus of the debate, but rather the attainment and maintenance of sufficient transmission capacity and reliability.

Further, the grid investment test as it was run this time is too time-consuming. It is not clear how much time Transpower spent developing its grid upgrade plan, but it is likely that it took at least as long to develop as the Commission took to analyse it. Conservatively, this means that the process took at least two years – and a "no" answer means that everyone has to start again from step one. Contact finds this process unacceptably time-consuming for such a time-critical investment as transmission upgrades.

Most fundamentally, Contact has concerns about whether the grid investment test allows a long-term perspective on transmission investments. We share David Close's concerns that the test as currently applied tends to favour incremental transmission solutions. That is, the focus of the test seems to be avoiding blackouts, when it might be more appropriate for the test to recognise the strategic value of the

transmission infrastructure and its potential role in enabling business investment and economic growth.

Contact therefore submits that the Commission should consider a staged implementation of the grid investment test. Developing an investment proposal is a long and resource-intensive process. We believe that the grid investment test should support this process to the extent possible. To this end, we suggest that the test be broken down into stages aligned with a normal project development process. For example, the implementation steps could be broken into:

1. Establishing the need for investment
2. Analysing options
3. Developing the concept
4. Performing detailed investigation and feasibility analysis
5. Identifying the preferred solution, including detailed design

In effect, the steps go through a high-level analysis at the initial stage, down through successively more detailed steps, until the final detailed design stage. At each juncture, the relative accountabilities and responsibilities of Transpower and the Commission, as well as the criteria for approval to proceed to the next step, should be agreed and clearly articulated, and key stakeholders be given the opportunity to participate.

In this way, the issues and questions that are presented in each step are debated and resolved before approval is given to proceed to the next step. Contact notes that this approach is not inconsistent with the grid investment test methodology, contained in Schedule F4 of the Electricity Governance Rules, which specifies the factors that must be considered in the test – but not whether they need to be considered concurrently or sequentially.

In Contact's opinion, such a staged approach would have several advantages over the current grid investment test process:

- *More timely consideration of grid upgrade projects*
  The Commission would be able to approve each stage as it was developed, rather than waiting for a final detailed design before the GIT was applied. Such an approach will ensure that time and resources are devoted to developing projects that have a strong chance of proceeding. From a planning perspective, it would mean that a "no" decision would not send a fully developed project back to the drawing board; rather, it would return the process to the previous approval step.
- *More involvement of industry participants*
  A staged approval process would mean that industry participants would have a chance to provide input into the process at each stage of its development. This will provide two benefits: it will allow the Commission's analysis to be more fully developed and its assumptions to be more rigorously tested. It will also give industry participants a greater opportunity to examine and evaluate the investment proposal from their own perspectives.
- *Separation of high-level and detailed concerns*
  A staged approach would allow different sets of concerns to be considered at separate times, thus allowing, for example, more thorough consideration of high-level issues such as the appropriate amount of

capacity to build. Contact considers that this would go some way to mitigating concerns about the lack of a long-term planning perspective in the grid investment test, as it would allow industry participants to focus on the objective of the grid investment, rather than the choice of technology.

Specific Concerns

Transmission corridor

Contact supports the urgent establishment of a transmission corridor – i.e. securing resource consents or designations, and easements – irrespective of what decision on the upgrade is taken.

Securing such a corridor would represent a valuable option in that it would enable much more rapid development of a transmission line at some point in the future, and it would eliminate one of the biggest uncertainties around the timing and cost of such a development.

Further, as time goes on and land-use change progresses apace in New Zealand, there is a risk that it will get progressively harder to secure the rights for such major infrastructure development. Accordingly, there is a very real danger that if rights for a transmission corridor are not secured now, it will either cost far more to secure it in the future or it may not be unable to secure it at all. Indeed, this is an example of the kind of strategic consideration that we feel the GIT does not currently handle well. One of the advantages of implementing a 400kV solution rather than 220kV is that there will be less of a requirement to build new corridors in the future in an increasingly resource-management constrained world. Whilst this may appear to be common sense, it is hard to put a $ figure on. There are also environmental advantages of such an approach, which again are hard to quantify.

However, it is our understanding that, under current law, a resource consent cannot be obtained for a generic future need. Resource consents are granted for specific projects, and since a 400 kV line would have a different impact on the landscape than, for example, a 220 kV line, detailed knowledge of the proposed project would be needed before a consent could be granted. Contact suggests that the Commission may want to consult with its own legal advisors as to the legal feasibility of establishing a transmission corridor. Given the long lead times of such an exercise, and the asymmetric risk of having too little grid compared with too much, Contact suggests that if there is no overwhelming difference between options, consents should be secured for the option which supports development of the largest amount of capacity.

Availability of Upper North Island thermal generation

Contact has concerns about the market dynamics aspects of its analysis. We are particularly concerned about the Commission's assumptions of the availability of upper North Island thermal generation and the availability of reactive support.

Market dynamics with regard to wet (or windy) periods are such that there will be times when thermal generators will not want to run their plant, even at times of peak, because opportunity cost of fuel will be greater than expected electricity revenue. A demonstration of this is given in the Attachment to this submission.

Graph 1 shows the output of the upper North Island thermal generators during July and August of 2005, a dry period. This graph shows that, during this time period, thermal plant is operating at Maximum Generation during periods of peak demand – exactly as expected by the Commission.

In contrast, however, Graph 2 shows the same time period for 2004, a wet year. This graph shows that, even during times of peak demand, Otahuhu B and Southdown were often operating at minimum generation levels, and Huntly did not generate at its peak during this time.

If thermal plant is already offered into the market, then it is possible that the system operator could constrain such plant on to cover periods of peak demand. In this case, the costs of such constraint will need to be taken into account.

More importantly, it should be noted that the market rules are likely to change, which will remove the artificial and perverse incentive on generators to suppress prices at times of scarcity. Once this change goes through, it is likely that thermal generators may make a decision to switch off for periods of time during wet weather, when the market price of electricity is less than the cost of burning gas to generate electricity.

From Contact's perspective, in 2004, even at minimum generation levels, we were not making a commercial return on Otahuhu B output. However, across our portfolio, it made economic sense for us to continue to operate the plant since, without Otahuhu B, prices in the upper North Island would have dislocated, and we would have been exposed on our retail base. However, the implementation of transmission hedges would mean the majority of our retail load would be covered, thereby enabling us to make more commercial (and economically efficient) decisions with regards to operating Otahuhu.

It is important to remember that, if thermal plant is switched off, it is likely to be off for a sustained period. This is due to the significant costs and physical limitations associated with starting up large thermal plant[1]. The system operator cannot constrain on plant that has not been offered.

Under the current market design, it is not possible for generators to capture the capacity / security benefit they bring to the market. Of course it is possible to design such mechanisms (e.g. ancillary services payments, or development of a specific capacity mechanism), but until such mechanisms are in place, it would be wrong to make assumptions that upper North Island thermal generators will be operating at the level assumed in the EC analysis.

Forecast Demand

Contact does not agree with the manner in which forecast demand was calculated. We understand that the starting point for the demand forecast was an average, rather than the actual most recent demand. We believe such a starting point should always be the most recent, weather-corrected peak demand. Historic fits should then be used to predict demand growth from this point.

Contact notes that New Zealand recently experienced a new record high peak electricity demand, due to a cold snap.[2] It is our understanding that the peak could have been even higher, as not all major loads were connected at the time. The peak was such that we understand lines companies were exercising significant load

[1] For example, it can take 12 – 15 hours to ramp up a thermal plant from a cold start.

[2] New Zealand peak demand of 6630 MW recorded between 5.30 and 6.00 PM on 20 June 2006, according to Transpower. www.transpower.co.nz/?id=6051

control during the period. We consider that this is a timely reminder that the grid must be resilient to extreme weather events, as well as "average" weather and demand growth.

With respect to the Commission's analysis, we generally agree with the economic analysis with respect to modelling the impacts of faster than expected demand growth, taking into account the lead time associated with grid development. However, we do not feel that the modelling sufficiently considers "lumpy" demand growth (e.g. one or two hundred MW of industrial demand coming on in a short space of time) or extreme weather events.

Transmission Alternatives

Contact strongly believes that transmission and generation are complements, not substitutes. That is, we do not consider that generation is inherently reliable enough to be considered a perfect substitute for transmission investment. However, we consider that when the GIT is next applied, it should be as complete a process as possible, so that there is no risk of having to re-run the test.

Accordingly, when the GIT is next applied for Transpower's revised Auckland 400kV proposal, Contact believes that generation and demand-side alternatives should be considered alongside transmission alternatives.

Feasibility of Alternatives

Contact notes that the alternatives considered in the Commission's analysis are desktop studies and thus have not been as rigorously examined as the investment proposal itself. From our perspective, this means that questions remain regarding the feasibility and cost of actually constructing and operating the alternatives.

An example of this concern is the new transmission line section adjacent to the ARI-PAK line. It is our understanding that the longer the construction of a new transmission line is delayed, the more complicated it will be to implement that section (as load growth will mean that there is no longer enough capacity in the system to remove the ARI-PAK line prior to construction, and building a new line in close proximity to an existing one raises technical difficulties). Further, this additional difficulty is likely to escalate costs, which should be reflected in the cost estimates for constructing the ARI – PAK section of the line.

In addition, the possibility of construction delays for the alternative projects may have ramifications in terms of grid security. Contact believes that any alternatives that are compared to the proposed project under future application of the grid investment test should be realistically able to be constructed and implemented.

Reliability

Contact considers that it would be prudent to test the proposal and the alternatives against the performance obligations of the system operator. The system operator is obligated by the Electricity Governance Rules to run the grid to a specified security standard in real time. This is a different exercise than the forecast modelling that has been done to date, as it is able to simulate "real" conditions, rather than theoretical scenarios.

Such modelling would be invaluable, as it would demonstrate how the grid would need to run under the different alternatives – and thus the operational consequences of each alternative.

Good Electricity Industry Practice

Contact has concerns regarding the apparent differences of opinion among different transmission experts with respect to the Commission's alternative options. It appears that the Commission has a greater tolerance for risk than other parts of the industry, particularly Transpower, despite the fact Transpower faces a set of legislative and commercial objectives. The options put forward by the Commission for augmenting the existing transmission system to allow large transmission investment to be delayed are complex, rely on multiple pieces of kit, and extend the use of the existing assets. Contact has concerns regarding the inherent security in such an augmented system.

Contact also has concerns about the combinations of technologies proposed under the alternatives. The recent power outage in Auckland is a salutary reminder of how unintended consequences can arise from adapting a system to cope with changing circumstances – versus the more inherently reliable route of designing the system to accommodate future needs.

The definition of Good Electricity Industry Practice, according to the discussion paper, is based on Australia's definition. However, it is not clear in which jurisdictions the alternative technologies have been employed. If it is outside Australia, then there is a possibility that the use of those technologies would not be acceptable under the Australian definition of Good Electricity Industry Practice, and thus would not be acceptable under the proposed definition for New Zealand. One way to address this issue is to have the system operator test the alternatives for their operational feasibility, as suggested above.

Further, Contact believes that the definition should include system operation. As proposed, the definition only refers to the asset owner.

Incremental vs Long-Term Planning

Contact tends to agree with the comments of David Close, who argued that in the development of the grid investment test, "attention has been diverted from some of [its] objectives…and from the prime purpose…to develop and implement long-term plans for investment in the grid."

Contact believes that the inherent flaw with the grid investment test as presently configured is that it suffers from asymmetry of information. It is relatively easy to calculate the costs of constructing a large transmission asset; and when costs are large, the net present value of delaying that construction is also large. It is much more difficult to calculate what the benefits of that asset might be. This is because the benefits depend on future events that either have many different causes, and are thus very difficult to predict; or they have a very low probability of happening, but a high potential impact, and are thus not amenable to usual modelling techniques. The result is that, at present, there is perhaps an overfocus on the "easier," more tangible costs (and benefits of delay), and less of a focus on the more intangible benefits of building a new transmission line. Some of these benefits are mentioned in more detail below.

Contact thus has concerns that the benefits of early investment in a new transmission line are understated in the current analysis. It is difficult to predict in advance the long term economic benefits that might eventuate from such an investment. Contact notes that similar concerns have been expressed in other jurisdictions, such as Victoria, Australia. In a recent document about the future of its

networks, the Victorian Energy Networks Corporation concluded that there have been

"long term economic benefits of efficient high capacity infrastructure such as the 500 kV electricity transmission network established by Victoria three decades ago. It is not clear that this backbone network would have emerged if current transmission planning approaches had been used at the time."[3]

Enabling growth and investment

Contact believes that a key difference between the proposal and the alternatives is capacity. The potential capacity of the proposal is significantly different than that of the alternatives. Under the proposal, Transpower have indicated that there is the ability to release approximately 2000 MW of additional capacity relatively quickly and cheaply. This option does not exist under the alternative options.

Thus, Contact believes there is a fundamental difference between the proposal and the alternatives. The alternatives are focussed on avoiding system failure under a range of modelled scenarios. The proposal, in contrast, could be seen as an enabling part of the infrastructure, by virtue of the flexibility it would afford the transmission system into Auckland. This capacity may facilitate technological change and enable economic growth and investment to a greater extent than the alternatives analysed. Contact considers that greater weight should be given to these factors in the upgrade decision.

Facilitating competition

Contact also considers there may be differences in competition benefits between the proposal and the alternatives that the Commission has not factored into its analysis. There are differences in unconstrained capacity between the sets of projects – both in actual capacity, as shown in the Commission's analysis, and in potential capacity. Contact considers that more capacity should lead to greater amounts of competition, and thus we believe that the Commission may have overlooked these benefits when it concluded that the competition effects would be roughly equal among analysed projects.

In addition, Contact does not consider an examination of past market dynamics to be predictive of the future. As we noted elsewhere in this submission, market rules are likely to change in the future, and market participants are likely to adapt their strategies in response. Thus we believe that any analysis of competition benefits should be forward-looking.

Role of the Grid Investment Test

The discussion document focuses heavily on the Net Present Value calculations of the proposal and the alternatives, but Contact would like to stress that this calculation is only one input into the Commission's decision as to whether or not to approve a transmission investment. The Electricity Governance Rules outline a number of objectives for the grid investment test in section 6.3, some of which have an economic focus, and some of which relate to less quantitative aspects of grid investment, including:

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[3] *Vision 2030: 25 Year Vision for Victoria's Energy Transmission Networks*, Victorian Energy Networks Corporation, October 2005. Available at http://www.vencorp.com.au/html/index.htm

- Reflecting the interests of end use customers in ensuring a reliable transmission system, having regard to the cost;
- Promoting certainty for investment in transmission, generation, and transmission alternatives and investment contracts
- Facilitating outcomes acceptable to Transpower and designated transmission customers

Further, the Rules state that the Commission has discretion in approving transmission investments, and that in exercising this discretion it must have regard to regulatory costs and to the need to avoid unnecessary delays in approving reliability investments (Rule 13.3). The Rules thus provide a way to mitigate the risks inherent in the approvals process, including the costs of regulatory uncertainty and the risks to security of supply if investment is delayed.

Finally, it is important to remember that transmission investment has an impact on the wider market, and decisions on it need to fit within the overall policy framework for the electricity sector. Thus consideration should be given to how any transmission decision fits within the Commission's policy objectives under the Government Policy Statement.

Contact submits that all of these factors are relevant considerations in the context of a decision on a major transmission investment and should be explicitly included in the Commission's decision process.

Calculation of Loss Benefits

Contact disagrees with the Commission's method of calculating loss benefits. The Commission bases its calculation of losses on the system SRMC. This methodology seems to be based on the assumption that sufficient generation capacity exists, and hence the cost of meeting losses is the short-run cost of operating that plant to meet the additional losses incurred under the Commission's alternatives. For instance, the Commission says that in dry years, when the Minzone is breached, the reserve plant will be dispatched earlier to make up the energy difference caused by increased losses. The implication seems to be that the Commission believes the cost to society from maintaining the additional reserve capacity (or alternatively, the cost of less security as reserve plant is used to meet losses) is fully reflected in the marginal operating costs of the plant over those periods for which the plant is operated.

Contact believes that a more economically sound approach would be to assume that the LRMC of generation reflected the opportunity cost to society of the resources used in meeting energy demand (whether from load or losses). The LRMC of generation can then be compared with alternative means of meeting demand (load plus losses), such as increments of transmission or demand reduction.

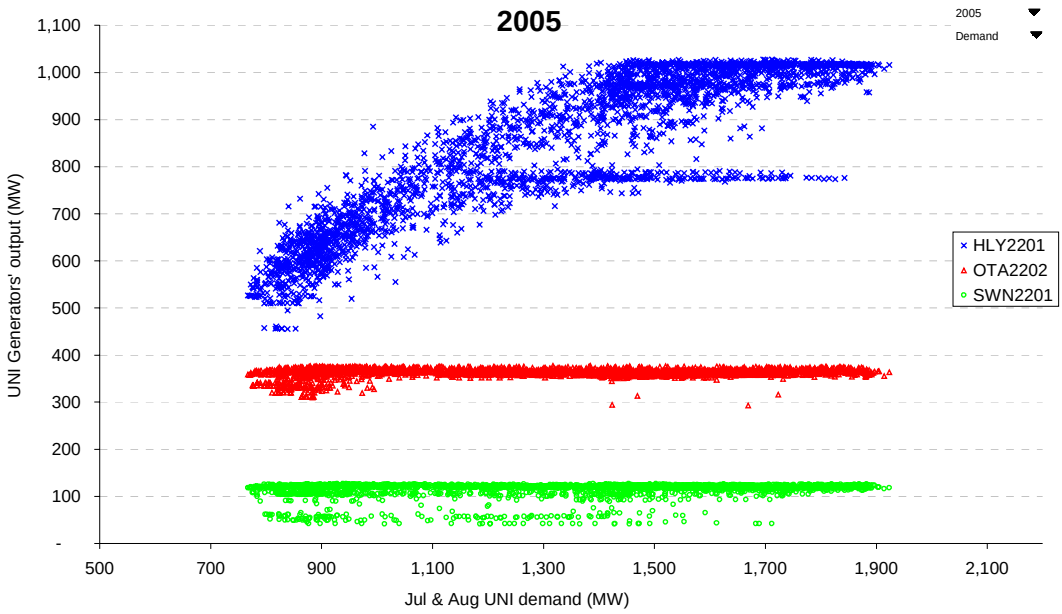
Sensitivity analysis

Contact believes that the following parameters should be added to the Commission's sensitivity analysis:

- A sensitivity with a higher carbon charge
- Fuel cost should have a higher sensitivity range (e.g. +/- 40%)

Attachment

Graph 1



Graph 2