TRANSPOWER
Keeping the energy flowing

Waikoukou
22 Boulcott Street
PO Box 1021
Wellington 6140
New Zealand
P 64 4 495 7000
F 64 4 495 6968
www.transpower.co.nz

21 January 2021

Dane Gunnell
Manager – Price-quality regulation
Commerce Commission
44 The Terrace
Wellington

Dear Dane

Cross Submission
Major Capex Project draft decision: Bombay Otahuhu Regional Major capital proposal

We welcome the opportunity to submit our views to submissions on the Commerce Commission's draft decision regarding our Bombay Otahuhu Regional Major Capex Proposal[1]. We support the Commerce Commission's draft decision of our Proposal.

We would like to comment on the specific aspect of the Vector submission which discusses the reduced resilience at Wiri resulting from our Proposal. The aim of this cross-submission is to ensure that Vector, the Commerce Commission and other stakeholders understand our general approach to reliability of supply, including resilience.

Reliability of supply

Broadly, a reliable power system has enough generation (or flexible demand) and network capability to supply customers with the electricity they demand, with a high degree of confidence.

In New Zealand we rely on market mechanisms to deliver sufficient generation[2], with the provision of network capability falling to network owners, who are either regulated (such as Transpower), or are governed by community-owned trusts.

Our network planning approach therefore assumes generation adequacy and focuses on reliability of supply from two aspects:

- *Reliability of network equipment* – reliability of the electrical equipment that makes up the transmission grid

[1] Commerce Commission: Bombay Otahuhu Regional major capex proposal - Draft decision and reasons paper - 26 November 2020
[2] Which requires a well-functioning generation investment market, including prices which are clearly signalled, forward information provided regularly and policy certainty from regulators and government.

- *Resilience of network equipment* - to external events, e.g. extreme weather, flood, fire, earthquakes, human error

We have detailed historical information for both aspects. We use that information to ascertain the probability of a particular event occurring. By multiplying that probability by the estimated consequence or losses (in dollar terms), we determine the expected economic cost of that event.

Separately, we determine the cost to mitigate or reduce the consequence or losses from those events. Where that mitigation cost is lower than the expected reduction in economic cost we invest, otherwise we do not.

Events caused by the reliability of network equipment are more common than resilience-related events. Modern asset management techniques also mean that network equipment events are more predictable and so we can plan a network to provide an appropriate level of supply reliability, with a reasonably high degree of confidence.

Resilience events, however, tend to be infrequent (it is common to assume a single event over hundreds of years) and difficult to predict – although the consequences can be high. The term High Impact Low Probability (HILP) events is used to describe some types of resilience events.

We always evaluate network equipment reliability in our analysis, but we do not always evaluate resilience. Generally, the expected probability of resilience events is so low that mitigation is not expected to be viable. Where the expected consequence of an event would be high (such as a widespread loss of supply to the Auckland region) however, we do consider resilience.

Wiri resilience

Our Bombay Otahuhu Regional Major capital proposal proposes that the Wiri-Bombay line (which has reached end-of-life) will not be replaced. Therefore, it is true that we are reducing the resilience at Wiri, because Wiri will be supplied by a single double circuit transmission line rather than two double circuit lines in the future. This means that if events were to occur which result in the loss of both circuits on the remaining Otahuhu-Wiri line (such as tower failure), supply would be lost to Wiri.

We discussed this issue with Vector prior to submission of our Proposal. Vector suggested that we include an additional option in our analysis where both lines are retained. This is Option 7, which is the same as the Proposal, with the additional retention of the existing Wiri-Bombay line.

We have considered resilience events which might result in loss of a tower on the Otahuhu-Wiri line, as the most obvious resilience challenge. We used Transpower's historical tower failure statistics (excluding those associated with wash outs or flooding, which are not relevant risks for the Otahuhu-Wiri line) and assumed that it would take 3 days for supply at Wiri to be restored.

That equated to an annual value of $17,000, which over 50 years has a present value of approximately $0.25 million.

Investment to retain the Wiri-Bombay line would be more than $20 million, being the estimated cost to replace the existing end of life conductor, hence the economics do not support retaining this line for resilience.

Our database of resilience events is based on New Zealand tower failure incidents over the last 57 years. Climate change may have an impact on the occurrence of future extreme weather events and this is worthy of consideration. However, even if we multiplied the probability of all resilience events

by a factor of ten (which seems unlikely), we would still only assess the economic cost of a resilience event at Wiri to be $2.5 million (over 50 years), compared to a cost of $20 million to mitigate such events.

Our conclusion is that it is more economic to reduce the resilience of the supply to Wiri, rather than invest to retain the current level of resilience. The existing resilience is higher than at many other grid exit points and is a result of Wiri being connected to the regional 110kV through the transmission network from Otahuhu to Bombay and further south to Hamilton. The balance of the line south of Wiri is no longer required with the direct connection of Bombay to the 220kV grid backbone, as reflected in our Proposal.

If you have queries relating to this submission, please do not hesitate to get in touch.

John Clarke
General Manager – Grid Development