TRANSPOWER

UPPER SOUTH ISLAND RELIABILITY MCP STAGE 1

ATTACHMENT D CONSULTATION ON OPTIONS

Transpower New Zealand Limited
June 2012

Keeping the energy flowing

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Transpower New Zealand Limited The National Grid

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1| Introduction

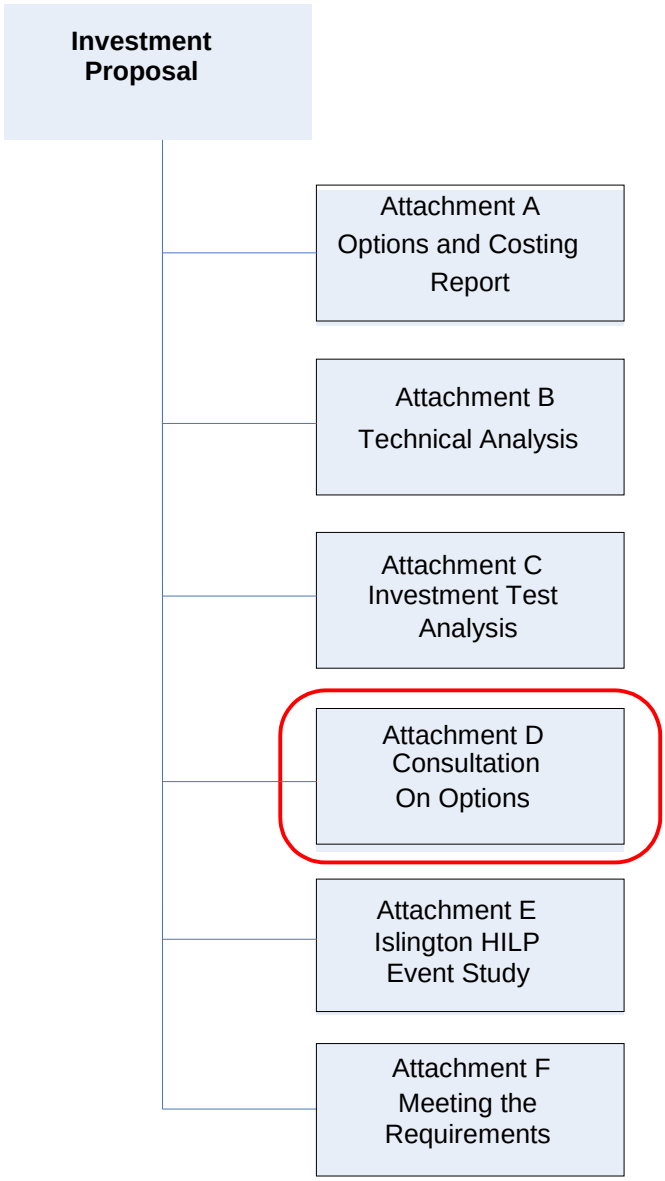
1.1 Purpose

The purpose of this report is to capture the consultation engagement with stakeholders. This document covers the Long List and Short List consultation with stakeholders.

1.2 Document Structure

This report forms part of the Upper South Island Reliability Investment Proposal, as set out in the diagram below:

Figure 1-1: Document structure



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1.3 Overview

Long List Consultation – Requestion for Information

In June 2011, we published a consultation document detailing the need for investment in transmission or generation and demand-side alternatives in the Upper South Island region. This investment is required to ensure that the transmission system remains stable and reliable beyond 2016.

Our document sought feedback on what upgrade options should be considered in the Upper South Island (USI) and what assumptions and approach we should use in analysing these options. Specifically we sought feedback on:

- the assumptions and approach to be used in our analysis
- generation and demand-side alternatives
- potential transmission options for improving dynamic voltage stability in the Upper South Island.

Our consultation document also acted as a Request for Information (RFI) on any transmission alternatives[1] for the Upper South Island that may defer the need for transmission investment.

In total we received five submissions from interested parties:

- Orion New Zealand Limited
- Mighty River Power Limited
- Energy Response Pty Limited
- Trustpower Limited
- Metering Technology Limited

Short List Consultation – Draft Major Capex Proposal

In May 2012, we published a draft proposal Stage 1 consultation document detailing the need for investment in voltage stability in the Upper South Island region by 2014. Given the uncertainty around generation and demand growth in the region the proposal is broken into two stages.

This investment proposal sought feedback on our shortlist options for our draft proposal stage 1 and our preliminary application of the Investment Test. Specifically we sought feedback on:

- modified generation assumptions
- a preliminary application of the Investment Test
- commencement of consenting and designation process for Orari

In total we received six submissions from interested parties:

[1] Defined in Electricity Industry Participation Code 2010, Part 1, page 61 as **Transmission alternative** means an alternative to investment in the **grid**, including investment in local generation, energy efficiency, demand-side management and distribution network augmentation. These are also called non-transmission solutions by the Commerce Commission.

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- Orion New Zealand Limited
- Mighty River Power Limited
- Contact Energy Limited
- Trustpower Limited
- Alpine Energy Limited
- Metering Technology Limited

The purpose of this document is to summarise the responses received and outline our reply.

We wish to thank those that took the time to make a written submission.

The submissions can be found on Transpower's Grid New Zealand website. For more information please refer to: www.gridnewzealand.co.nz/publications-and-resources.

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2 Long List Consultation

2.1 Submission Overview

The five written submissions focussed their discussion on a range of transmission alternatives including potential generation within the upper South Island and demand-side management.

The submitters included two of New Zealand's electricity generator/retailers (Mighty River Power and TrustPower), Orion (the Christchurch-based distribution company), and Energy Response Limited and Metering Technology Limited, two companies focussed on offering approaches to demand-side management.

The first three of these submitters offered specific answers to the 13 questions included in the RFI document while the latter two focussed specifically on the demand-side alternatives they advocate. Apart from Orion's submission, we did not receive submissions from any of the other affected distribution companies within the Upper South Island.

General Themes

The submissions indicate a clear level of interest in the investigation and particularly in the potential role of transmission alternatives.

A theme across the submissions is the view that transmission alternatives will have a role to play in deferring major capital investment in the grid in the upper South Island. Reasons advocated include the increasing generation needs of the upper South Island, an expectation of improvement in the commercial incentives to invest in South Island generation and also the advancements in Demand Side Management (DSM) as technology and experience are developed in this field.

The submissions highlight:

- the range of potential generation options in the upper South Island that may provide a solution
- the benefits of shorter-term tactical solutions that delay the need for investment prior to additional generation coming on-line
- a willingness from parties to develop demand management schemes.

Transmission Options: Comments from submissions

There was little comment within the submissions on the transmission options listed in the RFI. Orion submitted that transmission options should include the consideration of new grid exit points to better manage HILP (high impact low probability) events.

The point is acknowledged and will be part of the assessment of Orari options as part of stage 2 investigation.

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2.2 Transmission Alternatives

2.2.1 New Generation: Comments from submissions

The RFI indicated the role of new generation in the upper South Island with benefits including the possible deferment of transmission investment. Parties clarified the current status of a number of known generation developments with Mighty River Power highlighting early development plans for a wind farm proposal in the greater Cape Campbell area. Submitters also indicated a willingness to negotiate grid support contracts around these developments.

2.2.2 Demand-Side Management: Comments from submissions

Three of the submitters advocated for demand-side management solutions. These were:

Energy Response Pty Limited

Energy Response submitted that "both transmission and non-transmission options should be considered for the different and multiple benefits they offer Transpower in the upper South Island." They referred to their role as "the dominant aggregator for the Demand-Side Participation trial in 2008 in the upper South Island" and believe, "that a firm capacity of demand reduction can be replicated (in the upper South Island) during the summer and irrigation period".

Metering Technology Ltd

Metering Technology Ltd's submission detailed their EFR long wave load management system/platform and advocated that this "will enable Transpower to introduce, perform and support DSM initiatives in the New Zealand Electrical Industry unlike any other technology has previously been able to deliver". Their submission includes a discussion on the history of Load Control in New Zealand and how it has become fragmented between technologies and regions. Their proposed solution of Long Wave Load Control was discussed in depth including how it operates, its functionality, benefits and how Transpower could use this to place itself "in a position to conveniently load-aggregate using a dedicated modern load control platform and remove reliance on third parties to perform such ad hoc services".

Orion

Orion's submission proposed the continuation of the upper South Island Load Manager as "a tactical alternative to transmission (investment)". The upper South Island Load Manager "was mainly developed to coordinate load management during upper South Island peaks but the platform/system has enabled much more – processes for better grid emergency management, planned outage coordination, datasets of historical load management and load forecasting etc." Orion believes these benefits should be recognised in the cost-benefit analysis.

Demand Assumptions: Comments from submissions

Submitters were in general agreement with the demand assumption specified in the RFI. Orion noted the projections were "conservatively prudent" particularly following

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some lost demand following the Christchurch earthquakes. They also noted the strong growth in the south-east of Christchurch/north-Ashburton area with the likelihood of a new GXP being required in that area in the future.

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3 Long List - Stakeholder Submissions

3.1 Submissions to Questions

The following table summarises the response to each question asked. Submitters are identified as follows:

- Orion New Zealand Limited (OR)
- Mighty River Power Limited (MRP)
- Trustpower Limited (TPW)

Stakeholder Questions	Transpower's Response
Q1. Are there any other issues or considerations that we should incorporate into this project?	
(OR) noted strong peak demand growth in the southwest of Christchurch and in particular around Rolleston Township and the potential need for a new 220 kV grid exit point. The USIGU work should consider how this will occur and how a new GXP could be used to better manage HILP (high impact low probability) events at Islington.	For managing HILP events new substations or GXPs are a costly alternative. The measures included in the draft proposal are a more cost effective means to ensure Islington is more resilient to HILP events.
(MRP) Mighty River Power believes that the long list of options should also consider transmission line upgrades. Transmission line upgrades are necessary in certain regions of the Upper South Island to facilitate future generation projects.	Future generation will require transmission connections and may require transmission upgrades in certain regions of the upper South Island. However this transmission would be north of Christchurch and would have little effect on the need for voltage support. The new generation itself will have a more significant effect and this has been accounted for in the generation scenarios.
Q2. Do you consider that our voltage performance criteria are appropriate for this project (see Section 1.2)?	
1 Yes – 2 no comments	
Q3. Do you agree with our long list of options?	
(OR) consider that transmission options should include the use of new grid exit points to better manage HILP events. (eg Rolleston as per Q1)	Refer to response to Q1
(MRP) believes that the long list of options should also consider transmission line upgrades. Transmission line upgrades are necessary in certain regions of the Upper South Island to	Refer to response to Q1

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facilitate future generation projects (TPW) No comment.	
(TPW) Yes, but refer to Q4.	
Q4. Are there any other qualifying alternatives which should be considered?	
(OR) consider that there are other tactical alternatives to transmission. They have outlined three options which could be implemented. These are • continuation of the upper South Island Load Manager • installation of upper South Island distribution network diesel generation • installation of upper South Island distribution network capacitance	The upper South Island load manager has been demonstrated to successfully manage peak load in the region and its effect is presently incorporated into the load forecast. Ongoing funding of the upper South Island load manager has been secured. Distribution network diesel generation is an option that has been assessed as an alternative. Installation of distribution network capacitance does not change the need for dynamic reactive support, although improving the load power factor at peak loads, e.g. with distribution network capacitance, will reduce the need for static capacitors at the transmission level.
(MRP) believes that the long list of options should also consider transmission line upgrades.	Refer to response to Q1
(TPW) propose the benefits of additional generation in the upper South Island and its ability to provide voltage support both while dispatched but also at other times subject to suitable grid support contracts. In particular, the business case for constructing the 46 MW Arnold development would be strengthened by a grid support contract. The current HVDC link charges appear certain to delay the project, perhaps indefinitely, if applied in the current form.	Voltage support is needed most at times of peak load and this is when generation is usually connected and dispatched by the market. If new generation eventuates it would defer the need for transmission investment by netting off the load and providing voltage support. For example we think that Arnold generation, depending on its size, could provide between 2 to 3 years of benefit. However, we presently do not see the need to contract generation via a GSC for voltage support at off peak times
Q5. Do you consider the screening criteria are appropriate?	
(OR) consider that the screening criteria should 'place value' on • the development of new technology and systems that have the potential to provide greater benefits in the future. The development of demand side initiatives such as the upper South Island load manager fall into this category as the platform makes other demand side initiatives more likely in the future. • short term tactical upgrades or alternatives that delay the decision making for larger investments. Every	We agree with the comments Orion make and confirm that we do place value on such considerations during the screening process.

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year that passes brings new planning options to consider and therefore the delay of committing to large transmission investments has value. The consenting of hydro stations in the upper South Island and the Christchurch earthquake affect upper South Island transmission planning.	
(MRP) Mighty River Power believes that consideration should be given to how the grid in the Upper South Island would be upgraded over at least a 35 year period.	We agree with Mighty River Power, our development plan analysis has been carried out to 2050.
(TPW) Yes, and also see the 46 MW Arnold development project as consistent with all the criteria.	
Q6. Do you consider that the Reference Case identified would be appropriate for this project?	
(OR) Yes.	
(MRP) agrees that a reasonable Reference Case is the lowest capital cost option that meets the Grid Reliability Standards. However, they believe that transmission line upgrades should be included in the list of options. Mighty River Power agrees that the analysis will have to consider the sensitivity of the results to various assumptions about the timing of longer term investments, particularly transmission investments (eg new lines). This must be done in conjunction with forecast generation, and taking into consideration the life of assets and consents beyond the prescribed 20 year test period to take into account the future benefits.	We agree and this is the approach taken in our analysis. We are ignoring transmission upgrades required to connect new generation, as described in our response to Q1.
Q7. Do you consider this commensurate GIT approach to be reasonable for this project?	
(OR) Are concerned that a flat c/kWh price will be applied which in our view overstates the benefits of reduced losses. System losses are important where their presence leads to the need to invest in generation for energy or peak. In an increasingly renewable energy power system and growing wind generation, controlling load becomes more important than losses. The treatment of losses in the GIT should recognise this	The Capex IM requires that transmission losses are valued at their cost, rather than any sort of opportunity value. We use a Long Run Marginal Cost of generation as a proxy for the cost of transmission losses because ultimately, saved transmission losses result in a reduced need to build generation.
(MRP) & (TPW) Yes	
Q8. Are there other market costs or benefits which should be reflected in the analysis?	
(OR) See increased value from systems	The upper South Island load manager

and processes that encourage real time transparency of data and the sharing of knowledge between industry sectors e.g. upper South Island Load Manager.	has been demonstrated to successfully manage peak load in the region and its effect is presently incorporated into the load forecast.
(MRP) referred to their comments in Q5,6 regarding transmission line solutions considered over a longer period and this encouraging/enabling a greater range of generation options	Refer to responses in Q5 and Q6.
Q9. Do you consider the proposed analysis period to be appropriate for the evaluation of options?	
OR) Yes, but the long term plan must recognise that the future will look different to current predictions and therefore more emphasis needs to be placed on solutions that enable flexibility going forward rather picking a long term winner.	
(MRP) No. Refer Q5 and Q6.	Refer to responses in Q5 and Q6.
(TPW) Yes	
Q10. Do you consider that the demand assumptions are appropriate for this project?	
(OR) The demand forecasts are reasonably conservative (in the sense that they take the safe ground and have a low probability of occurring) and particularly in light of the recent Christchurch earthquakes which have dropped Christchurch peak demand by up to 90MW. The proposed demand sensitivity analysis is an appropriate way to address this uncertainty.	Presently the Christchurch peak demand is down due to earthquakes, but may recover beyond 2014. We've included a low demand sensitivity analysis in the investment test analysis.
Q11. Do you consider that the motor load forecast approach is appropriate for this project?	
(OR) Relying on survey data and the associated assumptions is always challenging but appropriate in the absence of better quality information.	We agree. Our proposal includes a load monitoring initiative which should provide better quality information in the longer term.
Q12. Do you consider that the generation and dynamic reactive support assumptions are appropriate for this project?	
(OR) The Belfast and Bromley diesel generation sites are both consented and could be implemented within 12 months of committing to either or both projects. Orion is offering the development of these sites as part of a combined upper South Island diesel generation alternative to transmission.	Distribution network diesel generation is a demand side option that we assessed in the development scenarios.
(MRP) supports the alteration of the Statement of Opportunity scenarios to better reflect projects currently moving through the consenting process and the	We have updated our scenarios for analysis to reflect 100 -150 MW of wind located south-east of Blenheim.

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likely timing of new generation. They anticipate making resource consent applications within the short to medium term for a 100-150 MW wind project located south-east of Blenheim. The likelihood of this project, and potential for growth in generation capacity beyond this, should be reflected in the scenarios for the analysis.	
(TPW) noted that Arnold and Wairau are listed. From TrustPower's perspective, these projects are not committed and remain critically dependent on the HVDC charging regime being revised. They provided various corrections to the RFI generation specifics. • Corrections suggested to Table 8-1 : • Existing Arnold Wet and Dry dispatch should be 3 MW • Cobb Capacity and Wet dispatch should be 32 MW • Corrections suggested to Table 8-2 : Arnold hydro development peak generation should be 46 MW	We note that future Arnold and Wairau projects are not committed. We have dispatched existing Arnold close to 3 MW for our updated winter scenario. Cobb capacity is adjusted to 32 MW and based on historical data during our updated winter scenario we have dispatched it close to 24 MW. Noted that Arnold peak generation should be 46MW.
Q13. Do you consider $24,200/MWh is appropriate for valuing lost load for this project?	
(OR) noted the review of VOLL by the Electricity Authority (Strata survey) is almost complete. They would expect the results of this survey to be incorporated into the upper South Island options analysis	The Electricity Authority have not yet completed their review of VoLL and we do not expect this to occur in the short term. Nevertheless, we sensitise our Investment Test result to VoLL, using values of $10,000 per MWh and $30,000 per MWh around the assumed value of $20,000 per MWh. We consider this range is likely to cover any change the Electricity Authority will make.

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4| Short List Consultation

4.1 Submission Overview

The six written submissions focussed their discussion on a range of generation transmission alternatives within the upper South Island.

The submitters included three of New Zealand's electricity generator/retailers (Mighty River Power, Trustpower and Contact Energy), Orion and Alpine Energy (Christchurch-based distribution companies), and Metering Technology Limited focussed on offering approaches to demand-side management.

One of the submitters offered specific answers to the six questions included in the Upper South Island Reliability – Stage 1 draft proposal while two submitters made general observations of our draft proposal and the latter one focussed specifically on the demand-side alternatives they advocate.

General Themes

The submissions indicate a clear level of interest in the investigation and particularly in the potential of Orari bussing as a potential investment for Stage 2.

A theme across all submissions bar one is the view that Orari is a good option in the absence of significant generation in the USI and they supported Transpower's Orari preliminary work in Stage 1 of the proposal. One of submissions noted 300 MW of wind generation by 2018 and another of the submissions was focused on demand side management (DSM) as an alternative to investment and generation.

The submissions highlight:

- that our assumptions around there being no consistent generation options in the upper South Island is accurate i.e. currently wind generation only supports generation while there is wind.
- the benefits of shorter-term tactical solutions that delay the need for investment prior to additional generation coming on-line
- the recovery rate to pre-Christchurch earthquake is slower than originally thought.
- a willingness from parties to develop demand management schemes.

Transmission Options: Comments from submissions

Most of the submissions commented in support of the transmission short list options out lined in the draft consultation proposal, including the progressing to keep Orari alive as an option for Stage 2.

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5 Short List - Stakeholder Submissions

5.1 Submissions to Questions

The following table summarises the response to each question asked. Submitters are identified as follows:

- Orion New Zealand Limited (OR)
- Mighty River Power Limited (MRP)
- Contact Energy Limited (CEL)
- Metering Technologies Limited (MTL)
- Alpine Energy Limited (AEL)
- Trustpower Limited (TL)

Stakeholder Questions	Transpower's Response
Q1. Are our modified generation assumptions reasonable and more appropriate than our June 2011 assumptions'?	
(CEL) The modified generation assumptions are considered reasonable and appropriate at this stage. Contact Energy understands that any generation projects that are planned to be built and commissioned in the next 6 years (up to 2018) can affect the Upper South Island upgrade.	
(MRP) In general terms, it appears reasonable to consider a less ambitious set of generation scenarios in light of the lack of presently committed projects, uncertainty over the forward demand curve and Transmission Pricing Methodology changes that could affect South Island generators. With regard to Mighty River Power's own generation projects, since 2007 we have been assessing the wind resources in the greater Cape Campbell area in the Upper South Island. We have undertaken early design and environmental work and believe that the site offers exceptional potential. The project would be expected to be sized at between 150 - 300 MW in capacity. We note that there is insufficient headroom in the existing Blenheim-Stoke-Kikiwa-Argyle transmission network to allow for dispatch without a special protection scheme, even at the	

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lower end of the estimated project capacity. If other generators' projects under development in the area are built, the quantum of constrained generation would likely be unacceptable. It is important that investment in transmission infrastructure provides for new generation injection.	
(MTL) It is appreciated that demand and demand growth cannot be precisely determined; however, the documentation asserts on p. 12 that "none of the scenarios include enough generation….." Therefore the question, regardless of how data is considered, assessed, adjusted or whether it is mutually agreed to be reasonable or observed by independent third parties in its assumptions or otherwise, can only confirm that there as a requirement for new generation that cannot be immediately provided in the short term or within the next decade. Thus NTS is the only real practical approach sought in the time frames proposed. We interpret from your documentation that NTS are not viable, economic; or can be implemented within the projected time frames. We respectfully point out that the EFR long wave submissions that we have made over the last two years can still be implemented within the time frames indicated, and that they remain technically valid and offer Transpower the least cost solution, should Transpower wish to investigate and seriously consider this flexible investment opportunity.	We plan to consider NTS when confirming the investments to meet the need from 2016 onwards (Stage 2). It is anticipated that an RFP for NTA will be issued shortly as part of the Stage 2 investigation.
• **(TL)** We agree it seems unlikely that any major new generation project will be commissioned in the upper South Island before 2020. • Our own Wairau project is currently looking less attractive than previously and is not being actively pursued at the moment. This project currently ranks behind the Arnold project in TrustPower's list of priorities. • Our Arnold project has also slowed, particularly following a review of earthworks/construction costs. We are continuing to investigate but at this time the project does not look viable and will not be commissioned before 2018. • We are aware that the Amethyst project is nearly complete. • We are also aware that there is a lot of interest in irrigation storage systems on the Canterbury plains.	

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We would not be surprised to see one or two 20MW size projects enter the resource consenting phase within the next 3 to 5 years.	
Q2. Is our short list options and short listed development plans reasonable?	
(CEL) There are no specific technical details or results in Attachment B to support the preferred or short list options. The Pound Road switching station option (as per Orion's original submission) should be re-visited as it provides an alternative bussing point as well as new GXP point for Orion. All of the options presented above still rely on Islington as the main point of supply to Top of South Island and West Coast.	A new substation at Pound Rd would allow diversifying assets away from Islington, provides a future GXP point and location for future reactive support, and hence would provide less reliance on Islington. However there is only a minor improvement in N-1 voltage stability transfer limits (similar to the 6th bus coupler) for a cost estimated between $20-$30m. In addition Pound Rd does not provide significant resilience benefits until a new line is built. The measures included in the proposal are a more cost effective means to improve USI resilience of supply to HILP events than building a substation at Pound Rd at this time.
(MRP) The short list of options appears reasonable, particularly if the most demanding scenario for voltage recovery is a contingency at Islington. However, Mighty River Power notes that the 20 year analysis period for the Investment Test has required the inclusion of a prospective new transmission line from the Waitaki Valley to Christchurch. Although this line is only expected to be built once Upper South Island demand net of Upper South Island generation exceeds thermal capacity of lines into the region, this option is nonetheless an expensive one, estimated at ~$500m. As generation prospects and demand evolve in the Upper South Island, transmission capacity upgrades within the Upper South Island could enable more significant generation investment within the region itself, thereby providing a means to defer the Waitaki-Christchurch transmission investment. Mighty River Power advocates for these trade-offs being considered in subsequent stages of Upper South Island investment proposals. We note specifically that upgrading transmission assets in the Blenheim-Stoke-Kikiwa-Argyle area will facilitate the dispatch of renewable generation from wind (Cape Campbell) and hydro projects in this region. The availability of sufficient grid capacity will be one of the	The analysis demonstrates that more generation in the upper south island has the potential to defer the need for new transmission capacity between Waitaki valley and Christchurch. In our analysis the timing of a new line (and other transmission investments) is sensitive to the market development (generation) scenario and hence is essentially considering the trade-offs for later stage investment proposals. It is recognised that upgrading transmission assets in the Blenheim-Stoke-Kikiwa-Argyle area will facilitate dispatch of renewable generation at the top of the south island. This will be studied further to determine the likely firm generation that would result from such an investment as an MCP.

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principal drivers in Mighty River Power's Cape Campbell investment business case.	
(AEL) Alpine Energy Ltd is fully in support of your proposal to install a sixth bus coupler at Islington as well as further investment to address the impact of HILP events. We are also of the view that the Orari facility as an option for stage 2 investment is worthy of further investigation.	
(OR)	
Q3. Is our preliminary application of the Investment Test reasonable?	
(CEL) Presuming that the options chosen were technically sound then the investment test applied is reasonable.	
(MRP) No Objections.	
Q4. Do you consider our draft Stage 1 proposal to be robust to sensitivities?	
(Con) Yes	
(MRP) No Objections.	
Q5. Is our draft Stage 1 proposal reasonable?	
(CEL) Please refer to feedback for Question 2	
(MRP) No Objections.	
(OR) Support Transpowers proposal to implement the following tactical and cost effective projects.	
Q6. Is it reasonable to add the cost of 2.14m for preliminary work to establish Orari to our draft Stage 1 Proposal?	
(CEL) if this option comes out of the technical assessment (question 2) as the preferred option, then yes, it is reasonable to add the cost of $2.14m for the work to establish Orari to draft stage 1 proposal. However, as per Questions 2, we believe that the Pound Road Switching Station option should be considered further as part of this budget as there seems to be a need from a customer perspective.	Refer Q2.
(MRP) Given the uncertainty over generation prospects in the Upper South Island, the fact that Orari bussing work has a significant lead time, and that Orari bussing would become necessary in a low generation scenario, preliminary work to establish Orari as an option appears reasonable.	
(AEL) As we have indicated in the past, we are of the view that the Orari option potential offers us a means of developing our network at a lower cost than would be the case without such a facility. We	

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further agree with your assessment of the increased complexity for grid operation which addition reactive devices may introduce.	
(OR) We agree that the bussing of the four 220kV lines at Orari is an option worthy of further investigation and support your proposal to undertake more feasibility work before committing fully to land owner engagement and the cost of consenting and easements. In particular we would like to better understand how the line connections can be designed to mitigate the risk of a complete failure of the Orari site and how compatible this proposal is with future connections to the 220kV core grid between Timaru and Christchurch. We have identified the need for a new 220kV GXP to the southwest of Christchurch in 10-15 years and Transpower planning engineers intend to provide connections options to Orion in September 2012. Given that the emerging population forecasts suggest that the USI load is likely to grow at a slower rate than the current Transpower forecast, we believe Transpower has sufficient time to consider the points raised in this submission before committing to a 'Stage 2' USI reliability solution.	The Orari facility study will include assessment of different bussing configurations to ensure a resilent solution. Busing at our near Orari provides the greatest benefit in reducing the need for voltage support. We are presently studying a new connection option for Orion further north in the Rollerston area and a new connection for Ashburton south of the Raikaia river. The studies will assess their compatibility with Orari bussing.
Other Comments	
(OR) Earthquake recovery scenarios (four in total) for population growth are now emerging from the greater Christchurch Urban Development Strategy group which cover the area served by the Christchurch City, Selwyn district and Waimakiriri district councils. Even the most optimistic scenario (rapid recovery) indicates that it will be 2021 before the projected population matches the pre earthquake forecast. New homes and commercial buildings are likely to be more efficient than the earthquake casualties and therefore it is reasonable to assume that the USI load in any given year will be lower than predicted prior to the earthquake. This of course must be tempered by people leaving the greater Christchurch area but remaining in the USI region. From a resiliency perspective, the option to install a new SVC at Bromley (as opposed to Islington) is also worthy of	The latest load forecast data will be considered when updating the demand growth scenarios for stage 2. An SVC at Bromley gives similar voltage stability benefit as one at Islington. Therefore a Bromley SVC is worthy of further consideration from a resiliency perspective.

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further consideration but obviously needs to be economic in a wider sense.	

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