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Dear Maree

Grid Planning Assumptions

1. Thank you for the opportunity to submit on the "Grid Planning Assumptions (GPA) February 2008 draft". No part of Mighty River Power's submission is confidential, and we are happy for it to be publicly released.
2. Mighty River Power is aware of the significance of the Grid Planning Assumptions (GPA's), both as an input to the Statement of Opportunities (SOO) and also as an input to comprehensive economic analysis for the Grid Investment Test (GIT). In this submission we first wish to address the link that exists between the generation scenarios in the GPA's and how these are used in the SOO. These comments are aimed at improving the resulting outputs from the SOO so that it can better address the needs of industry participants. The second half of this will address specific changes and suggestions for the GPA's as the commission has currently modelled.
3. Our views are set out under the following headings:
    - Generation Scenario Modelling as an input to the SOO
    - Specific Commentary for the Generation Scenarios

Generation Scenario Modelling as an input to the SOO

4. Mighty River Power has previously submitted on the SOO, with particular reference to the conclusions drawn from the results. We submitted that the Draft Initial SOO had comprehensively failed because it did not enable parties other than the Commission to identify potential opportunities, nor had it met parties' reasonable requirements, as intended by the principles of the SOO. Fundamentally the SOO was inadequate as it did not enable opportunities in efficient grid investment to be recognised. As a result of this, the SOO as a provider of information has been of little use to Mighty River Power, and arguably the industry, which should be one of the key audiences.

5. We attach our previous submission as it highlights a number of particular issues which have been left unaddressed.

6. Specifically, it is the Commission's interpretation of the purpose and intention of the GPA generation scenarios that are of concern to us. The Commission appears to have decided that the SOO is more important as a delivery mechanism of their own views, than it is as a document to enable identification of potential opportunities, as highlighted by the Commissions following statement[1]:

> "In practice, the SOO also has a wider role to play in informing stakeholders about the Commission's views of possible future developments in the power system."

7. As presented with a full set of generation scenarios, the SOO hides which new or upgraded transmission is required in absence of generation investment. For example, the Upper South Island Wairau project (73 MW) is included in all 5 of the generation scenarios, and always in 2011. For modelling purposes, this is the equivalent of stating that this project is a certainty, and hence we can draw from this that generation will reduce or eliminate the need for further investment in the transmission circuits into Christchurch. We consider that this type of approach changes the SOO into a "Statement of Solutions".

8. Mighty River Power does not dispute that the Commission has a requirement to "inform stakeholders about the Commission's views of possible future developments in the power systems", nor do we disagree that the SOO is an appropriate place to do so. However, the assumption that the Commission's views should take precedence above the purpose and principles of the SOO is questionable.

9. Should the Commission wish to inform "Transpower, investors in generation, other participants, end use customers and those interested in evaluating transmission alternatives" about their own views of "possible future developments in the power system", it should feel free to do so, but not to the point that the SOO loses its relevance and usefulness as a document that enables efficient investment opportunities to be identified.

10. Mighty River Power maintains that for the SOO to be of relevance to the intended audience, the original purpose and principles as laid out in the EGRs need to be followed:

> 9.1.2 The purpose of the statements of opportunities is to enable identification of potential opportunities for efficient management of the grid including investment in upgrades and investment in transmission alternatives.
>
> and,
>
> In preparing statements of opportunities, the Board must have regard to the following principles:
>
> 9.2.1 statements of opportunities should aim to meet the reasonable requirements of

[1] Paragraph 1.1.2, Grid Planning Assumptions (GPA) February 2008 draft for consultation: Overview Paper, Prepared by Brian Bull and Bruce Kirtlan

Transpower, investors in generation, other participants, end use customers and those interested in evaluating transmission alternatives;

9.2.2 statements of opportunities should reflect good electricity industry practice;

11. A workable solution that would address our concerns above would be to include only existing or committed generation projects and transmission upgrades in the SOO. This should be the first evaluation that takes place, and then this credible, known base case assessed against the possible states of generation scenarios.

12. We recommend that in accordance with the EGR's, the Electricity Commission enact the following changes into the preparation of the SOO:

    (a) disregard the generation scenarios when identifying "potential opportunities for efficient management of the grid including investment in upgrades and investment in transmission alternatives", instead using base case of committed generation and transmission upgrades.

    (b) take note of all comments as raised through this GPA consultation, to construct and publish a set of Grid Planning Assumptions with use for evaluating efficient grid investment.

13. Transpower has created a document called the Annual Planning Report (APR) following significant customer consultation, providing valuable information on potential transmission options to address potential issues. While we envisage that this would be materially different from a reconstructed SOO, as it produces customer specific upgrades and many options for upgrades – the value for the stakeholders would lie in aligning Transpower and Electricity Commission view's on when and where the next problems will arise. Transpower go on to evaluate for each region what effect the generation scenarios have after the potential problems have been clearly identified. i.e. They identify a problem and then a solution.

14. Mighty River Power recommends that the Electricity Commission construct a base case for the SOO, consisting of Transpower's committed upgrades, current generation and committed generation projects only, matched against expected and prudent demand growth scenarios. Further to this, we recommend that the generation scenarios are only modelled against this base case to show a set of possible outcomes.

Specific commentary for the Generation Scenarios

15. First and foremost, the scenarios appear to have been fitted and manipulated to sit along a nicely linear spectrum of percentage renewable outcomes (by 2025). This methodology is akin to using a "goal seek" strategy to solve for the set of generation scenarios, which is completely the opposite strategy to what we would suggest is appropriate.

16. By predetermining the output, the Commission has already to some extent decided what type of outcome it wants evaluated as a scenario in the GPA's. This does not give the set any semblance of credibility, as to reach these outputs, in many cases the Commission would have to unreasonably manipulate the set of inputs to reach the desired percentage renewable scenario.

17. Mighty River Power disagrees fundamentally with this approach. To maintain credibility as a set of likely (or even possible) scenarios, the only changes that should be made are to the fundamental drivers that would be reason for change within the scenarios. Should they all happen to arrive at approximately the same outcomes (in terms of renewable generation percentages), then this should be accepted as a reasonably likely set of scenarios. It is likely that with different fundamental drivers, there would be significant differences in the amount and location of wind, hydro, thermal and geothermal.

18. Mighty River Power recommends that the Electricity Commission dismisses the current approach for scenario creation, where the predetermined renewable percentages outcome is changed to an approach that varies a set of reasonable input assumptions. We recommend that the scenarios created using this methodology are used as detailed above. Further to this, we consider that the three greatest drivers in our generation investment experience that will alter the size and location of potential projects in the future are:

    - Access to fuel
    - Technology cost assumptions
    - Carbon cost assumptions

19. Access to Fuel: A prerequisite for a power station is access to a suitable source of fuel. For this reason, wind turbines are located on windy ridges, hydro at suitable geological sites along a river, and thermal gas stations at a suitable place along the pipeline. Included in this assumption is the ability to consent a project, particularly for wind and hydro which can have impacts on a large area. For example, an alteration to the fuel access input assumption would be to impose restrictions on consentability of all hydro projects which would create large storage ponds, or areas that are too close to urban communities.

20. Technology Cost Assumptions: All generation technology is currently in high demand, especially given the Governments policy goals around reducing emissions. This has the potential to create large supply crunches on technology, driving the price for a particular generation source up – and leading to long delivery times. For example the future of wind may be altered worldwide by a particular country (India or China) adding a large subsidy and creating orders for several thousand turbines. This phenomenon has been seen recently with the hike in wind generator prices, and could take some time to return to normal.

21. Carbon Cost Assumptions: New Zealand has ratified stage I of the Kyoto protocol which commits us to reducing greenhouse gas emissions to our Kyoto target (New Zealand's emission level of 1990). The Emissions Trading Scheme will result in NZ adopting the global price of carbon, as the anticipated shortfall may need to be purchased from overseas sources, and the proposed scheme is limited to the "global market". The long run price of carbon (especially for the entire forecast period) is not yet known and will be at best a guess. For a country that has not participated in carbon based trading for very long, Mighty River Power would recommend that at least one scenario eliminates the cost of carbon.

22. By way of illustrating our point that the Commission has undertaken some form of "goal seek" process to create the scenarios, we highlight the following inconsistencies – these modified input assumptions appear to be needed to reach the results, and are included for no other reason:

    - Tiwai Shutdown: The recent public announcement by Meridian and New Zealand Aluminium Smelters[2] should remove any possibility that the Tiwai smelter will cease operation prior to the end of this contract in 2030. Thus the inclusion of this in the "sustainable path" scenario 1 seems inconsistent with reality. We infer that it sits within this scenario as the only means to achieve a 90% renewable target by 2025 (along with the corresponding shutdown of Huntly coal units). Mighty River Power recommends that Tiwai be included in all scenarios until at least 2030. We note that as this scenario has the same name as the policy directive in the GPS, that it is more likely to be used solely as a sensitivity in GIT analysis. For this reason it is imperative that the Tiwai shut assumption is corrected.

    - Carbon Tax: We note that carbon taxes are included in all scenarios, with an increasing eventual level ranging from $20 up to $50, for the entire forecast period. Considering that the New Zealand energy industry has never actually had a carbon charge, and still does not have an enforced carbon charge, it seems aggressive to assume that in all future scenarios that a charge will exist to some extent. Accordingly, we recommend that at least one scenario eliminates carbon charging.

    - Gas Prices and linked Carbon Charge: It is our view that an increased carbon charge in conjunction with an increased gas price is unlikely to eventuate. The reasoning behind such a viewpoint is that the quantum of gas available is directly linked to the extraction of condensate from the ground. Thus gas is of a fixed and finite quantity. With an increase in the cost of carbon (carbon charge), then a priori – the demand for gas as a fuel source will drop, yet supply will remain stable. To maintain equilibrium,

[2] NZAS and Meridian Energy Ltd sign power contract, 1 October 2007.
http://www.meridianenergy.co.nz/AboutUs/News/Rio+Tinto+announcement.htm

the price of gas in the New Zealand market will have to drop to the point it is again desirable.

23. We also offer the following commentary on assumptions used to determine outcomes:

24. Diesel fuel cost: The current GPA's assume a delivered price of $25/GJ for diesel, which we consider to be low. The recent use of diesel at Whirinaki in February was approximately equivalent to 285L/MWh, which translates to $370/MWh at the current pump price of $1.26/L, equalling $33/GJ. To translate this back to $25, a 25% discount would be necessary, at current prices – which may or may not be reasonable. We highlight these very high variable costs as it is the direct reason that no generator would make such an investment decision, and note that the only current diesel generation in the market is levy funded. Additionally, and more importantly, this is one of the only fuels available in New Zealand that is directly linked to the world price. In general, long run oil prices are only going to trend upwards, not remain constant. We recommend that the assumption for diesel fuel needs to be updated to better reflect an expectation of long run prices.

25. Co-optimisation of transmission and generation: The Commission is intending to develop a method of co-optimisation of generation and transmission investment that will "potentially be able to be used for the final SOO scenarios"[3]. We consider this to be a material change to the underlying process of scenario creation and would strongly recommend that such a change was not undertaken without a full period of consultation with interested participants. Such a change would appear on face value to conflict with an earlier statement made in the same consultation document, that the EC that "[GEM] is not intended to be used as a tool to centrally plan the electricity system".

Conclusions

In summary,

26. Mighty River Power recommends that the Electricity Commission construct a base case for the SOO, consisting of Transpower's committed upgrades, current generation and committed generation projects only, matched against expected and prudent demand growth scenarios. Further to this, we recommend that the generation scenarios are only modelled against this base case to show a set of possible outcomes.

27. Mighty River Power recommends that the Electricity Commission dismisses the current approach for scenario creation, where the predetermined renewable percentages outcome is changed to an approach that varies a set of reasonable input assumptions.

28. We recommend that changes are only made to a fundamental set of three drivers, being access to fuel, technology cost assumptions and carbon cost assumptions.

[3] Clause 44, "2008 GPAs: Draft Generation Scenarios"

29. Mighty River Power recommends that Tiwai smelter be included in all scenarios until at least 2030.
30. As carbon charging will be new to New Zealand, we recommend that at least one scenario eliminates carbon charging when building the generation scenarios.
31. We recommend that the assumption for diesel fuel needs to be updated to better reflect an expectation of long run prices.
32. Mighty River Power strongly recommends that co-optimisation of final SOO scenarios should not be undertaken.

If you have any questions regarding this submission, please contact me on (09) 308 8213.

Yours sincerely

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10 June 2005

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Dear Jenny

Initial Statement of Opportunities

Thank you for the opportunity to comment on the Draft Initial Statement of Opportunities (Draft Initial SOO). Mighty River Power's submission is set out under the following headings:

- Requirements of Part F
- Inadequate compliance with Part F
- Further matters requiring enhancement
- Summary and recommendations

1. Requirements of Part F

The underlying purpose of the SOO is stated under rule 9.1.2 of Part F of the Electricity Governance Rules:

> The purpose of the **statements of opportunities** is to enable identification of potential opportunities for efficient management of the **grid** including investment in upgrades and investment in **transmission alternatives**.

Further detail as to how this should be interpreted is provided in the "principles" under rule 9.2:

> In preparing **statements of opportunities**, the **Board** must have regard to the following principles:
>
> > 9.2.1 **statements of opportunities** should aim to meet the reasonable requirements of **Transpower**, investors in generation, other **participants**, end use customers and those interested in evaluating **transmission alternatives**;
> >
> > 9.2.2 **statements of opportunities** should reflect good electricity industry practice

The Grid Planning Assumptions (rule 10) are also intended by Government to play a key role in the development of a SOO which industry and other stakeholders can rely on in their identification of investment opportunities related to the grid and/or transmission alternatives.

2. Inadequate compliance with Part F

The fundamental question when assessing the overall adequacy (or otherwise) of this document, is to identify to what extent has it accomplished its underlying purpose. As mentioned above, rule 9.1.2 of Part F states that a SOO must "enable identification of potential opportunities for efficient management of the grid including investment in upgrades and investment in transmission alternatives" and "aim to meet the reasonable requirements of Transpower, investors in generation, other participants, end use customers and those interested in evaluating transmission alternatives". Mighty River Power would argue that the sole or primary audience for the SOO are parties other than the Commission. Consequently, it is the Commission's responsibility to provide information about the capability of the grid (and we would argue potentially energy adequacy) to those parties which allows them to consider opportunities that they may know of, have access to or may seek out.

Accordingly, two key questions must be answered when assessing the SOO:

(1) does the SOO *enable* parties other than the Commission to identify potential opportunities for investment in either transmission upgrades or alternatives?; and

(2) does it meet parties' *reasonable* requirements in doing so?

We submit that the Draft Initial SOO fails in both respects. As a member of the target audience for this document, as it presently stands, we do not find it useful. The primary problem in our opinion is the Draft Initial SOO's lack of a clear, factually-centred, baseline scenario against which its five current scenarios can be interpreted and market participants can identify transmission options and/or alternatives.

At the highest level, therefore, our view of the requirements of Part F for the SOO would be, first and foremost, for an analysis to be conducted based on a reasonable expectation of demand growth, of the power system in its current configuration, including:

- Transpower's committed upgrades;
- Current generation; and
- Committed generation investments.

Part F already provides for this in rule 10.3.1.1 where it states that grid planning assumptions should include "committed projects for additional generation". By introducing the key missing baseline scenario which only considers current and committed new generation, the existing grid, approved grid enhancements and potentially a range of consistent demand scenarios, stakeholders would have access to factually based analysis to build into their internal decision making processes regarding future investments. It would effectively signal the point at which either demand exceeded generation capacity (signalling the need for additional generation), or demand exceeded the current capacity of the grid (signalling the need for transmission augmentation or additional appropriately located transmission alternatives). Such a scenario should be updated periodically to take account of changing

conditions and the announcement of new projects. This would then provide the "certain" baseline counterfactual against which the various scenarios could be considered.

In many respects, this approach is analogous to that used by Transpower in its System Security Forecast 2004 (SSF), in the sense that the latter:

> ... considers only existing generation and transmission assets with ***committed*** investment projects of which the System Operator has been made aware. On the demand side, a range of load growth scenarios are considered. The capability of the existing power system (and committed projects) to meet the load growth scenarios is assessed and situations where all demand may not be able to be met without further enhancement of the power system are identified [emphasis added].[1]

Therefore, we recommend, in the interest of:

(1) reducing duplication of effort (and increasing sector efficiency) and achieving the least overall cost outcome for end-users; and

(2) harnessing the expertise, data and analysis of Transpower in this field; and

(3) fulfilling the basic (and reasonable) informational requirements of industry participants such that they are *able* to identify potential transmission upgrades and/or alternative investments

– that the Commission adopts the SSF approach in order to fulfil this aspect of its role when producing the SOO.

We are not suggesting that the five scenarios developed by the Commission are of no value – rather, we believe that in order for their value to be realised, they must be able to be assessed in relation to what is known and proven. An understanding of plausible futures based on differing generation types, offers market participants further information and enables sensitivity analysis to be undertaken against the base-case scenario (i.e. they provide the opportunity to test how grid constraints might change as various, currently uncommitted, generation projects potentially evolve).

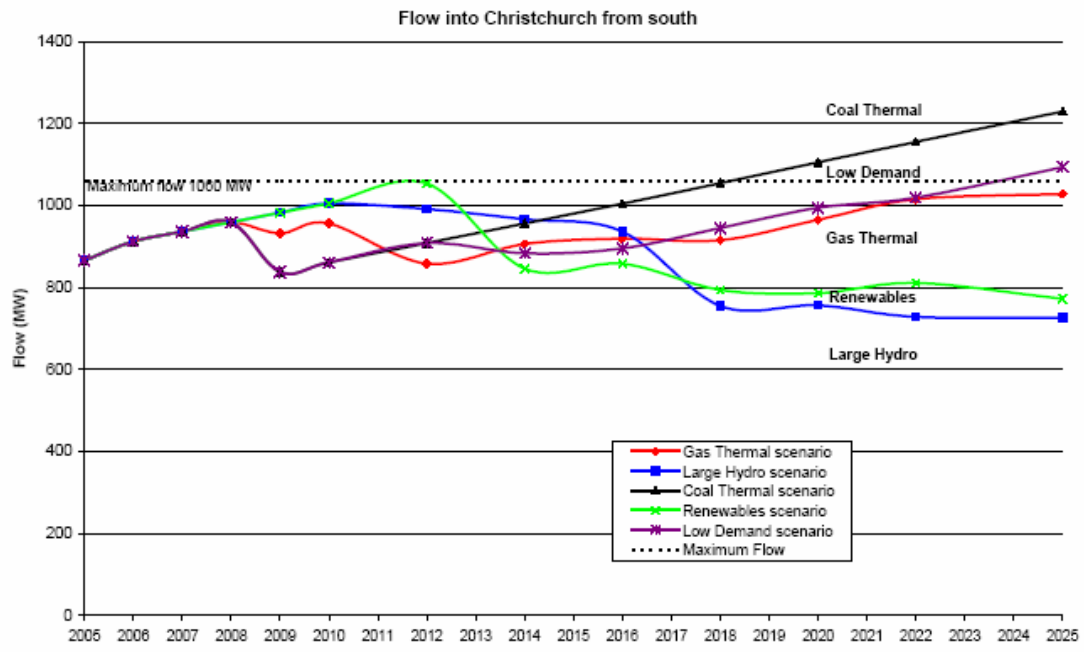
It is entirely understandable from a theoretical perspective, for the Commission to want to "optimise" New Zealand's generation future beyond the point where the existing grid can no longer meet demand for illustrative or information purposes, but we strongly contend that it is at this point that the SOO must separate reality from hypothetical scenarios, in order for participants to clearly identify tangible opportunities for transmission and transmission alternatives. Confusing the known with what is assumed creates uncertainty, and is likely to

[1] Transpower, System Security Forecast (2004), Section 1 "Security Forecast Approach and Assumptions, 1.

reduce opportunities for efficient investment; hence the importance of the baseline scenario in clearly delineating the "existing" from the "what might exist".

An example of how this confusion manifests itself can be seen in Appendix 7 of the Draft Initial SOO where transmission flows into Christchurch are analysed for each of the Commission's five scenarios (see following diagram).

Figure 25: Flow into Christchurch from the south



If we were to take these scenarios at face value, we would assume that:

(i) Except in the case of the renewables scenario, no additional transmission is required until 2018

(ii) Even under the renewables scenario, power flows just touch the 1060MW limit in 2012, and then fall away on an ongoing basis out to 2025 (and probably beyond).

Understandably, we were somewhat disconcerted when, in reviewing the assumptions for the renewables scenario, we saw that they included a 50MW wind farm in Christchurch by the year 2009 and a 210MW hydro station on the West Coast (Dobson) by 2013. Nothing addressed the very plausible chain of events, even under a renewables model, in which only one, or possibly neither, of these projects got underway, let alone within these timeframes. Given that demand both in Christchurch and north of that region is growing at approximately 20MW/year, these two *potential* developments have an enormous effect on the point in time at which transmission investment is needed. The SOO even highlights the critical nature of this

timing, given the long lead times for planning, consenting and constructing transmission (Chapter 9):

> "the completion of a new transmission line, including securing all the necessary regulatory consents and approvals, could take 5-10 years, whereas some new thermal generation or wind farms can be completed in as little as 18 months".

As it is Transpower's responsibility to undertake this process to ensure transmission adequacy, it needs a clear indication of the earliest the investment might be needed, given what is *known* about generation investment. If transmission into Christchurch were to take 10 years to plan, consent and construct, based on the information in the SOO, other parties relying on its contents could be forgiven for not realising that the date this is required to be operational in the SOO is contingent upon actions by third parties. In addition, Transpower would either surprise other parties by commencing its processes earlier than indicated or would need to be forgiven for not starting until 2009 and then potentially failing to meet supply if it relied on the SOO's timing. However, even the authors of the SSG report effectively commented on the fallacy of the non-baseline scenario approach:

> "Of the 5 generation scenarios studied in this analysis the Large Hydro Scenario has the least new generation installed north of Christchurch in 2014. If this generation was not present then the flow into Christchurch for the 2014 Large Hydro Scenario would rise...which would then require the addition of the new line"[2] [emphasis added].

We find it especially worrying that the Commission did not note this warning in the SOO itself. It is possible that, without the postulated investment, the limit into Christchurch could be breached in 2013 (given the analysis uses 2-yearly steps). Hence transmission investment could be needed less than 8 years from now: a fact which is buried by this scenario (hence the need for a baseline).

Moreover, we do not understand how one could legitimately argue that the scenarios developed as grid planning assumptions are either "as accurate as possible", or, given the billions of dollars of pending investment at stake, developed with a level of rigour that is anywhere near "commensurate with the economic significance of the decisions to be made on the basis of them".[3] Thus, we contend that the Commission should ensure a baseline (as detailed earlier) is developed and take steps to revise its current scenarios in order to tighten their assumptions and make them more plausible. The combination of these two steps would better allow other parties to understand the dynamics of the issues being faced, as opposed to the existing SOO approach which obscures them.

Notwithstanding our view on the inadequacy of the Commission's five scenarios in their present form, it is important to note that we are not advocating that transmission be built without knowledge of deferment possibilities. As stated earlier, we think appropriate

[2] SSG Report, page 25
[3] Rule 10.2.4.

scenario planning covering different plausible futures with respect to generation, potentially provides some useful information for stakeholders to take into account in their assessment of potential courses of action.

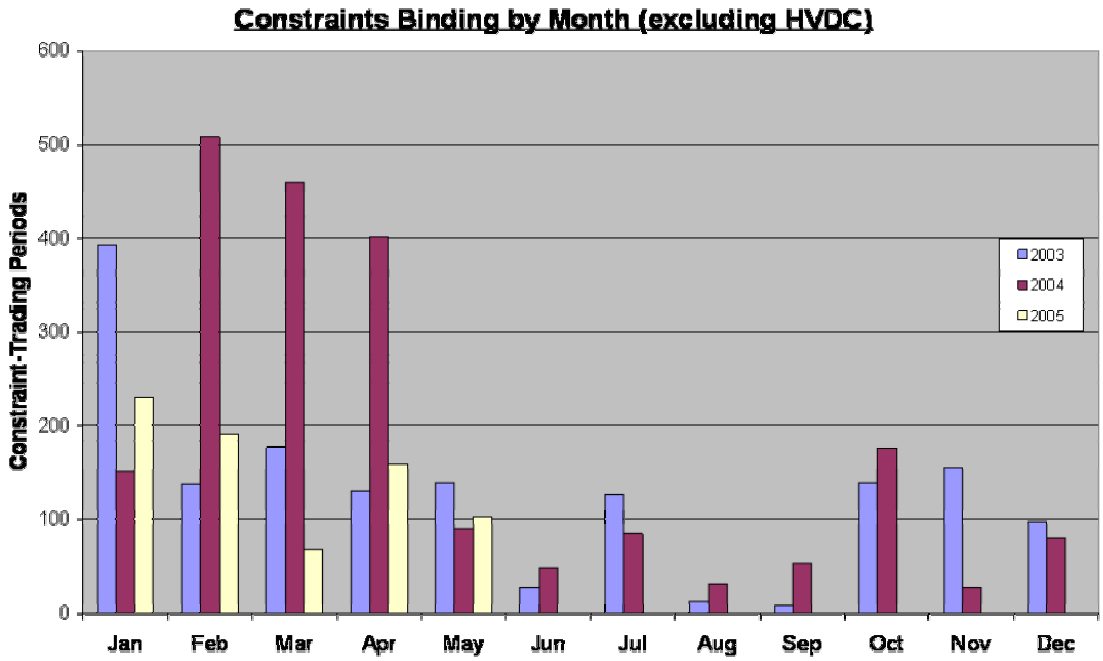
However, it is only prudent that the Commission makes it clear in the SOO what will happen if no generation investment occurs, particularly where constraints are critically dependent on local generation levels. Parties are unable able to discern what the alternatives might be if this type of baseline information is not provided, as they cannot see where or when the initial decision/s to either build new transmission or invest in alternatives are taken (i.e. you never get to see when the first deferment is needed or possible unless you can see where it will be required based on current and committed asset capability). Nor can parties readily discover what the reason for the increased levels of generation are under these scenarios (i.e. is it motivated by a desire to alleviate a constraint, or simply because of access to fuel sources such as wind or water).

3. Further matters requiring enhancement

There are also a number of other areas in which we believe the Commission can take corrective actions which should significantly enhance the value of a modified Initial SOO.

3.1 Summer peaks

Neither the SOO nor the System Studies Group New Zealand (SSG) report (used to derive the PSA) have considered summer peaks in their assessment or analysis. Whilst, on the face of it, the assumption that transmission loadings are at their peak in winter seems plausible, this is not always the case. Summer line ratings are lower due to additional heating effects, and it is also the time of year when major thermal generators (e.g. OTC) and Transpower legitimately choose to undertake maintenance. The appendix illustrates the number of binding constraints, by month, over the past 3 years. Clearly, January – April are the months when the transmission system becomes most constrained. The following graph shows that on average the majority of constraints (excluding HVDC) occur in the first four months of the calendar year.



3.2 Extended outage of major thermal plant

It is not clear whether the Draft Initial SOO has considered a prolonged outage of a major thermal generator. While a large generator *trip* is considered as part of the N-1 contingency analysis, it does not appear that the analysis has considered an outage of a major thermal generator that could last a number of months. Hence, the N-1 criterion must be applied both with and without the presence of generators such as Otahuhu. This is broadly consistent with the System Operator's approach to security planning.

3.3. Dry year conditions

Equally, dry year conditions have not been analysed. This is concerning given transmission constraints have been critical during recent hydro events in 2001 and 2003. In 2001 the Bunnythorpe to Haywards and Stratford to Haywards links were major problems. The solutions to these did provide some assistance, but there were still major issues in 2003, particularly from Stratford to Hayward and southwards across the HVDC link.

3.4 Insufficient analytical rigour

We are concerned at the number of inaccuracies throughout the report and evidence of rushed and/or uncompleted analysis on a topic of such strategic importance to the shaping of New Zealand's energy future. For example, Rotokawa is rated at 24MW rather than the correct figure which is 32 MW (this information is readily available in Mighty River Power publications).

We are also perplexed by the inconsistency between the rating for Rotokawa under the large hydro and renewables scenarios. Under the former, Rotokawa II is said to have 100 MW coming on stream in 2012, with Rotokawa III commencing production in 2018 at a further 100 MW. However, under the renewables scenario, Rotokawa II has grown in scale by a further 50% to 150 MW as at 2016, with Rotokawa III following in 2024 at the same MW rating. We are not aware of any reason for Rotokawa to develop at different rates under each of these scenarios given they are both renewables-based.

We draw this particular example to the Commission's attention, not because we have a view on which is correct, but because it highlights a fundamental problem in the way the scenarios are generated. We would recommend that the Commission develop a "master" list of generation development options ranked according to say LRMC (which would proxy the order in which they could be expected to come on-stream).

In developing alternative scenarios the Commission would then decide on how it was going to for example:

(1) Restrict availability of particular fuels e.g. gas or coal.
(2) Price fuels required for particular scenarios e.g. gas or coal.

Obviously plant affected by (1) and (2) would either move in rank or be unattainable. But, in no way would the magnitude of any one project be changing.

The change in size of potential projects in the existing SOO merely creates yet another variable that both confuses and obscures the truly valuable information that a reader can gain.

In addition, similar to the contents of the SSF, additional information must be provided to enable parties to assess the nature of the issues identified; for instance, thermal limits, stability limits or just energy adequacy, plus the characteristics of the issues e.g. how many MWs of for how many hours in each year. These characteristics are at the very core of what potential solutions may be valid.

In actually suggesting solutions rather than focusing on the nature of the problem the Commission has obscured the issues, overstepped the intent of the SOO and strayed into areas that are best left to parties that are competent to assess and deal with them.

Additionally, we are not encouraged by the repeated references within the Draft Initial SOO to various levels of incompletion of key aspects of its analysis and the large number of caveats littered throughout its more than 150 pages. For example:

> ...there has been ***no attempt*** to develop optimal transmission development plans for

each generation scenario. Therefore, the results of the power systems analysis and the high level conclusions must be interpreted with ***considerable caution*** [emphasis added].[4]

It is important to note that the Initial SOO has been developed in a compressed timeframe, working with a number of interim assumptions and has been ***limited*** to analysis of the main transmission network [emphasis added].[5]

Due to timing constraints, the Commission ***had not completed*** its own national and regional demand forecast model in time for the results to be used as an input into the PSA [emphasis added].[6]

It is important to note that the PSA for this Initial SOO has been ***limited*** to a relatively ***rudimentary*** high-level assessment and has not extended to the detailed analysis that would be necessary to support a GUP or a transmission investment proposal. In particular, there has been ***no attempt*** to develop optimal transmission development plans for each generation scenario, and there has been ***insufficient time*** to test the sensitivity of outcomes to variations in electricity demand and other factors. Therefore, the results of the PSA and the high-level conclusions ***must be interpreted with considerable caution*** [emphasis added].[7]

For a document with such far reaching implications for the security and reliability of national power supply, our expectation is that the Commission should have applied a far greater level of rigour to its research than these examples would suggest. It is all but impossible to see how this standard of analysis could be construed as meeting the "reasonable requirements of Transpower, investors in generation, other participants, end use customers and those interested in evaluating transmission alternatives".[8]

4. Summary and recommendations

Mighty River Power believes the conclusions set out in the Draft Initial SOO do little more than summarise in a very high level format, what industry participants already knew well before this document came into existence. For a number of years, it has been apparent to industry that unless something significant is done to address key matters such as the transport of electricity into the Auckland area, major economic, political and social consequences will inevitably ensue. Likewise, the vast majority of informed stakeholders are well aware of the transmission issues surrounding the top of the South Island and the HVDC link.

We take the view that the SOO fails to achieve its objective primarily due to a lack of information upon which market participants can reasonably identify opportunities for

[4] Page 7.
[5] Page 36.
[6] Page 95.
[7] Page 111.
[8] Rule 9.2.1.

transmission upgrades or alternatives. In order to do so, a further scenario must be added, acting as a baseline and thereby allowing parties to see where the first constraints appear, where they are located, and why they happened (be they energy deficits or transmission constraints due to thermal or stability issues).

The five extant scenarios offer value as a way of sensitivity testing the base-case under different circumstances, although as we have noted, all will require more work and refinement to ensure they are based on consistent and accurate data, as well as plausible assumptions of what might be built in the future. In particular, further work is required to address summer peaks, extended thermal plant outages, and dry year conditions, all of which have potentially enormous impacts on grid requirements.

Therefore we recommend that the Commission redrafts the Initial SOO in the following manner:

(1) Create a new baseline scenario which only includes known (existing and committed) transmission and generation assets based upon Transpower's SSF.

(2) Review this baseline scenario annually according to new project announcements and other relevant changes in circumstances affecting supply and demand levels and relative grid capacity.

(3) Remove all factual inaccuracies from the document and supporting analysis based on feedback from stakeholders and relevant (up to date) source material.

(4) Undertake all outstanding pieces of research and analysis that are required to remove caveats with respect to the reliability and accuracy of data, assumptions and conclusions within the document.

(5) Ensure key factors such as summer peaks, extended thermal plant outages, and dry year conditions are addressed.

If you have any queries in relation to our submission, please contact me on (09) 308 8213.

Yours sincerely

Neil Williams
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