

TRANSPowerNEWZEALANDLIMITED

Submission to the Electricity Commission on
Scarcity Pricing and Compulsory Contracting: options

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TRANSPower

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1 Introduction

1.1 Purpose of this document

This is Transpower's submission in response to the Electricity Commission's consultation on Scarcity Pricing and Compulsory Contracting: options.

This submission should be read in conjunction with Transpower's Submission to the Electricity Commission on Market Development Program: Overview, December 2009.

2 Executive Summary

The Electricity Commission (Commission) has raised three broad options that may, if implemented, improve security of supply and seeks feedback on the high level issues raised so that it may select the most "attractive" option for further consideration.

Development of any of the options is likely to be a significant undertaking. Transpower would observe that a scarcity pricing regime needs to precede any compulsory contracting regime, but the latter need not be developed concurrently. Indeed implementation of compulsory contracting first may remove the option of a scarcity pricing regime in New Zealand and be extremely complex to remove from the market design if unsuccessful.

The third option considered, consumer compensation during conservation campaigns, is to a large extent independent of the other scarcity pricing or compulsory contracting and may be of limited incremental value. Timely installation of new metering technology should negate the need for this option. Development of this option, if at all, should not detract from the development of a scarcity pricing regime.

The two scarcity pricing regimes proposed by the Commission are not independent. One is a specific case of the second more generic option. The more generic option, "Option B", should be developed to allow a wider understanding of scarcity pricing regimes, including both pre-shortage scarcity floors and the incidence of value of lost load (VoLL) prices when shortage occurs, to be gained.

3 Discussion

Transpower has consistently indicated a preference, and a desire, for the Commission to proceed with the development of a scarcity pricing regime for further consideration. A summary of previous submissions on this issue is set out in Appendix 2.

Transpower's responses builds on those previously made and concentrates on those aspects that are most likely to have a direct affect on Transpower's roles within the sector. A lack of comment on other points raised does not necessarily indicate agreement. For example Transpower has left others to comment on whether work on pro-competitive measures, such as enhanced market monitoring and a review of prudential arrangements, should proceed.

3.1 Compulsory contracting should not be pursued at this time

Transpower supports the approach that *"compulsory contracting should not be pursued further at this time, but should be retained as a fallback option"* not so much for the reason put forward, that *"if scarcity pricing/compensation mechanisms prove to be unattractive"*, but rather if scarcity pricing and or compensation mechanisms prove inadequate on their own to incentivise sufficient security of supply. That is, scarcity pricing and compulsory contracting, if introduced in the right order, are not alternative schemes but rather potentially complementary schemes.

Hogan¹ observes that a scarcity pricing regime is needed to support a capacity market. *"Inadequate scarcity pricing contributes to the "missing money" needed to support new generation investment. The policy response has been to create capacity markets. Better scarcity pricing would reduce the challenges of operating good capacity markets."* Scarcity pricing that might have only a small chance of manifesting itself on a significant scale in any one year may be insufficient to provide the commercial incentive for emergency peaking plant that in normal years will not be required to operate. Compulsory contracting could provide an efficient means of covering the ongoing fixed costs of such plant. However the first step is a scarcity pricing regime.

3.2 Detailed proposal for scarcity pricing should be developed

Of the two scarcity pricing options:

- **Option A – pure scarcity pricing** – administered VoLL prices only when shortages occur; and
- **Option B – modified scarcity pricing** – a phased implementation of administered scarcity price floors for pre-shortage situations (e.g. public conservation campaigns, mandatory load shedding) and VoLL prices when shortages occur.

¹ Page 18, Regulation and Electricity Markets: Smart Pricing for Smart Grids, October 16, 2009

Option B is the more generic regime, of which Option A is a specific case.

Option B should be developed to allow the study of a range of prices across a number of pre-shortage scarcity floors and a range of VoLL prices when shortages occur. Such an approach would also support the development of generic rules and systems within which scarcity prices may be altered if required².

In a severe dry year scenario it is very unlikely that all storage lakes will be drawn down uniformly due to the variability of inflows. Co-ordination between reservoirs will become complex. Option B offers the potential for a graduated approach that may assist reservoir co-ordination.

Option A relies on market participants including the risk of incidence of high, non-notified, VoLL prices in their decision making/risk management strategies. In a dry year, such a severe option without pre-shortage scarcity floors signals may create incentives for participants to gamble on an improvement in inflows since it may be valid to assume that orderly trading in the market may become so complex as to be unworkable when scarcity prices apply.

The discussion paper recommends pursuit of price floors when conservation campaigns are triggered, but not at least initially with VoLL pricing itself. The reason for this appears to be the assumption that, with price floors in place, scarcity in dry years would never occur, so the VoLL signal would be irrelevant. This is debatable, but most importantly fails to recognise the importance of scarcity pricing to signal supply shortages more generally than just dry years.

Market incentives need to exist for capacity investment and availability, wind balancing, and demand-side response in the short to medium term as well as for energy investment in the long term. The purpose of VoLL pricing is to provide that incentive – VoLL prices triggered by actual loss of supply might seldom if ever occur, but the industry investments and operational actions to avoid loss of supply and the consequent high prices would.

The VoLL pricing signal needs to work not only nationally against an energy or capacity shortfall, but also locally and regionally. Incentives on participants to avoid loss of supply need to apply locally and regionally as well as nationally. VoLL pricing does this.

While a scarcity pricing regime is simple in principle Transpower does not underestimate the potential complexity and resource required to develop a regime that will:

² In implementation the incidence of scarcity floors would need to be predictable. It is anticipated that triggers, or at least the mechanism for determining triggers, for moving to pre-shortage scarcity floors and VoLL pricing would be defined in the rules or in a published policy to minimise regulatory uncertainty.

- operate on a regional basis;
- require locational transmission hedges to enable participants to financially hedge the heightened financial risks; and
- link smoothly with the market dispatch and pricing mechanisms.

3.3 Prices during market distress

The paper identifies scarcity pricing may apply when demand is forcibly curtailed in response to dry-year energy adequacy and peak demand capacity adequacy.

Another mechanism used within the New Zealand market to meet demand during periods of scarce supply is to relax the security standard to which the power system is operated. The most typical example is at time of peak demand when the quantity of instantaneous reserves dispatched falls below the quantity required to cover the largest contingent risk, facilitated by reducing the reserve adjustment factors (“reduce the RAFs”). Other examples include:

- reducing regional or grid exit point security to N, e.g. Mangamaire to increase HVDC south transfer; and
- less frequent, treat HVDC south transfer as an extended contingent event.

The scarcity pricing regime should consider the introduction of scarcity prices whenever security, nationally or regionally, is deliberately reduced.

3.4 Other broad options to improve security performance

The current market design largely stems from the work undertaken in 1995 and 1996. At that time hydro generation met 77 per cent and fossil fuelled thermal generation met 15 per cent of electricity demand. While those designing the market anticipated that the number of market participants may increase it is not clear that further disaggregation of ECNZ, into Genesis, Meridian and Mighty River Power, was anticipated. In the last couple of years hydro generation met 54% and fossil fuelled thermal generation met 34 per cent of electricity demand.

When the primary market design was undertaken it was assumed that half hourly inter-temporal resource management (thermal unit commitment and inter and intra river chain hydro generation management) would be best achieved through the offer process.

With the growth in thermal generation and growing intermittent (wind) generation thermal unit commitment, given start times and minimum running loads, is becoming more challenging. A market design that manages the inter-temporal nature of thermal unit commitment, taking into account of; start times; ramp rates; and minimum running, would allow all thermal plant to be offered when available, potentially enhancing security.

3.5 Consumer compensation during conservation campaigns

Consumer compensation during conservation campaigns is to a large extent independent of the other options and may be of limited incremental value to either of the other two regimes, scarcity pricing or compulsory contracting. Development of this option, if at all, should not detract from the development of a scarcity pricing regime.

With the current mix of metering technology employed to meter domestic load, as noted by the paper, such a regime could be administratively complex. The first step in pursuing any domestic load demand side response initiative should be the installation of advanced metering, with the appropriate minimum specification, to reduce the administrative complexity and allow the introduction of pricing regimes which would naturally incentivise conservation during periods of scarcity. To what extent is the retention of old metering technology maintaining the apparent need for public conservation campaigns in dry years?

3.6 Link to managing locational price risk

The Commission is consulting concurrently on options for managing locational price risk. Some of these options involved forms of zonal pricing, whereby purchaser prices are averaged across a zone, either directly or through LRAs.

VoLL prices, depending on their design, could on occasion occur within but not throughout a zone, such as when a transmission constraint prevented other generation from alleviating a regional shortfall. Zonal pricing could severely dilute such a signal across the zone, to the point where observed prices might be much less than VoLL and market incentives to avoid supply shortfalls compromised. The larger the zone, the more significant this issue becomes.

If a scarcity pricing regime is introduced, as Transpower believes it should, any mechanism for managing locational price risk should be carefully designed to minimise any compromise to it.

It seems counterproductive to be trying to improve regional scarcity price signals while at the same time recommending damping locational signals by introducing LRAs, accepting that LRAs are not a strongly preferred option by the Commission.

Please see also our submissions to the Electricity Commission on *Market Development Programme: Overview* and *Managing Locational Price Risk*, December 2009.

3.7 Timetable for subsequent consultation paper

The Commission comments in the current consultation paper that it expects “to release a consultation paper on [the preferred] option and associated assessment of relative merits in early 2010”. This timeframe may under

estimate the complexity of designing a scarcity pricing regime in sufficient detail to understand:

- implementation issues (for example scarcity pricing needs to link smoothly with the market dispatch and pricing mechanisms);
- understand the relationship with energy and locational hedging;
- market power that may arise in a small market; and
- the change in investment incentives,

and undertake the necessary cost benefit analysis. Priority should be given to robust development rather than achieving an ambitious timeframe.

4 Recommendation

Transpower recommends that the Commission, in selecting a mechanism to improve security of supply for development and detailed evaluation:

- a. maintain its position of not proceeding with the development of a compulsory contracting option;
- b. recognise that:
 - i. of the two scarcity pricing options proposed, Option B is more generic of which Option A is a specific case;
 - ii. Option B offers most scope for a graduated approach, in support of choices to relax security standards and co-ordinate regional issues; and
 - iii. Option A has no pre-shortage price signalling, relying solely on the application of a single, high VOLL when shortage occurs. This may be too extreme for dry-year, national energy shortfall events.
- c. develop scarcity pricing option B with both pre-shortage scarcity floors and VoLL pricing when shortage occurs;
- d. note that the metering of domestic demand with appropriately specified meters would create the opportunity for market based buyback arrangements reducing the need for public conservation campaigns and mandated buyback arrangements;
- e. pursue a timetable, for subsequent papers, that reflects the complexity of the issues under consideration rather than any desire for an ambitious timetable; and
- f. note that a scarcity regime will heighten the need for participants to have access to a locational as well as energy hedging mechanisms that allows full hedging of basis risks.

Appendix 1: Consolidated List of Questions

<p>Q1: What concerns do you have with regard to security of supply under existing arrangements?</p>	<p>Both the Electricity Commission and the System Operator have undertaken analysis on a regular basis over recent years that has indicated adequate capacity and thermal fuel continues to be available to meet expected electricity demand, peak and energy. The 2007 review of the reserve energy regime indicated the need for the Commission to continue to monitor the success of the market design to incentives adequate investment. The events of recent years has brought into question the adequacy of the market design to incentivise utilisation of available assets and primary fuel in a manner that enables expected electricity demand to be met. In short the concern about security of supply under the existing arrangements is more to do with incentives to integrate the available capacity and fuel, including hydro, to meet electricity demand than new investment.</p>
<p>Q2: What, if any, other underlying issues lead to the potential for cost shifting among market participants?</p>	<p>The focus should be on providing adequate opportunity and incentive to invest, offer capacity, and to procure and manage primary fuel to meet expected electricity demand rather than the potential for cost shifting.</p>
<p>Q3: What is your assessment of pros and cons of scarcity pricing approaches versus compulsory contracting?</p>	<p>It is not so much a question of scarcity pricing versus compulsory contracting, but rather a matter of sequence. Scarcity pricing should be considered first and compulsory contracting added if necessary, refer section 3.1.</p>
<p>Q4: What other options should be considered to improve security performance?</p>	<p>A market design that manages the inter-temporal nature of thermal unit commitment, taking into account of; start times; ramp rates; and minimum running, would allow all thermal plant to be offered when available, potentially enhancing security. See section 3.4.</p>

<p>Q5 What approach to scarcity pricing should be preferred?</p>	<p>Option B is a more generic regime, of which Option A is a specific case.</p> <p>Option B should be developed to allow the study of a range of prices across a number of pre-shortage scarcity floors and a range of VoLL prices when shortages occur. Such an approach also supports the development of generic rules and systems within which scarcity prices may be altered if required. See section 3.2.</p>
<p>Q6 Do you agree with the outlined approach whereby the Commission will progress with a detailed proposal for a scarcity pricing regime and for a default buy-back arrangement? If not, what would be the best approach for moving forward?</p>	<p>With regards to progressing a detailed proposal for a scarcity pricing regime, yes: it should include VoLL pricing for unplanned loss of supply, to provide market based incentives for both dry year energy management and shorter-term and local or regional capacity management, including investment, wind balancing and demand response.</p> <p>With regards to progressing with a default buy-back arrangement, the benefits would need to be confirmed before proceeding with a detailed design. In any event the timely introduction of new metering for domestic load should overtake the need for a mandated buy-back arrangement. See sections 3.3 and 3.5.</p>

Appendix 2: Previous Transpower submissions on scarcity pricing

The current consultation paper on scarcity pricing is the fourth consultation paper issued by the Commission and Ministry of Economic Development in the last 14 months that has addressed this issue specifically or indirectly. A summary of Transpower's submissions on prior papers follows.

A2.1 Transpower submission on Electricity Commission: Market Design Review – Options Paper

Transpower comment on this paper relating to scarcity pricing and compulsory contracting included:

Address dry year fuel management problem as a priority

The Commission's focus seems to be mainly on developing initiatives which may help to mitigate the problem of inadequate generation capacity. Transpower does not have a strong preference for any of the capacity adequacy concepts proposed by the Commission, but agrees that they should be investigated further³.

Transpower also believes that addressing the capacity issue, while important, is less urgent than finding a way to improve the management of available fuel resources (hydro plus thermal) in dry years. At present, the market appears to provide generators with an incentive to use more water early in a dry year than is consistent with customers' security preferences, even when the presence of dry year conditions is apparent to all market participants. The result is a propensity to run short of fuel, even though the available thermal and hydro generation capacity would have been adequate to negotiate the winter period without stress if hydro fuel had been managed differently earlier in the year. In Transpower's view, this issue should rank close to the top of the Commission's agenda, as it affects security in the short term, whereas the capacity management proposals address longer term issues and are affected by long term developments such as the increase in the proportion of intermittent generation in the generation mix. A VoLL pricing mechanism may better reflect customers' security preferences⁴;

and

³ Page 2, Transpower submission to the Electricity Commission: Market Design Review – Options Paper, September 2008

⁴ Page 9, Transpower submission to the Electricity Commission: Market Design Review – Options Paper, September 2008

Investigate VoLL pricing

How VoLL pricing might be applied when demand is forcibly curtailed, because of capacity, fuel or transmission limitations, should be investigated further. If nodal prices were able to rise to VoLL in periods when supply is tight the asymmetry in the costs faced by generation and load when there is unexpected unserved energy would no longer apply and generators would have the right incentives to invest in peaking plant. The use of VoLL pricing would also encourage efficient demand curtailment (at least by those exposed to the spot price) and efficient investment by offtake customers in emergency generation.

VoLL signalling and the risk of high prices at the margin would also drive the need for new contracting products like caps, options and futures. This could invigorate the hedge markets and address some of the competition issues that are of concern to the Commission. In addition, a stronger hedge market would reduce barriers to new entry by both generators and retailers.

A2.2 Transpower submission on Electricity Commission: Review of 2008 Winter

In its submission⁵ on this paper Transpower encouraged the Commission to prioritise the implementation of particular recommendations. Transpower ranked as the first priority the implementation of recommendation 1, being:

The market rules be changed to ensure decision-makers face the cost to consumers of any forced demand curtailment, and then that the present reserve energy scheme be discontinued or modified to ensure costs are targeted as closely as possible to those parties who benefit from its use;

and commented that:

The Commission should act ahead of next winter [being 2009] to amend the market rules to ensure that, if forced demand curtailment occurs due to insufficient energy supply, spot prices default to the value of lost load (VoLL). This will ensure that market participants face the full cost to consumers of demand curtailment and provide the right incentives to manage available fuel (hydro and thermal) efficiently. Once this change is achieved, Whirinaki should be removed from the reserve energy scheme and sold to a commercial generator. Recommendation 2, which proposes investigating what the correct location for the Whirinaki generation units should be, and the best fuel to use, would then be irrelevant, as whether or not to pursue different location or fuel options would become commercial decisions.

⁵ Letter to Bronwyn Christie, Electricity Commission, Re: Review of 2008 Winter, 13 February 2009

While these actions are in train, the Commission should give urgent consideration to how it might best achieve its security of supply objectives by means other than direct intervention as a market participant.

A2.3 Transpower submission on preliminary reports to the Ministerial Review Electricity Market Performance

Recommendation 2 of the preliminary report to the Ministerial review of electricity market performance: *Improving Electricity Market Performance, Volume one: Discussion paper*, was:

[p]ut a floor on spot prices during any public conservation campaign or during any enforced power cuts in a dry year of, say:

- 2.1 \$500/MWh (50c/kWh) when a public conservation campaign is activated.*
- 2.2 \$1,000 - \$5,000/MWh (\$1 - \$5/kWh) if and when forced power cuts are activated.*

Transpower offered no comment on the concept of applying a floor price during public conservation campaigns. However, with regard to setting a price floor during forced power cuts, Transpower observed *“that the design details of such a scheme will be critical in order to ensure that it does in fact incentivise market participants to provide sufficient supply”*⁶.

⁶ Letter to Gareth Wilson, Ministry of Economic Development, 16 September 2009