Memo

To	John Rampton - Electricity Authority
CC	Ralph Matthes - MEUG
From	David Boles de Boer & John Stephenson
Date	27 June 2013
Subject	Unanswered Questions – TPM Conference

The Authority published a list of unanswered questions from the TPM conference held 29 to 31 May 2013. Two questions were directed to NZIER and one to MEUG which we respond to as follows.

Question 20 – regarding short and long run demand elasticities.

Our concerns regarding the Authority's approach to calculating consumer benefits were noted in Appendix A of our report to MEUG as tangential to the submission process. We were and are of the view that demand response is a policy matter that needs consideration in the broader architecture of any changes to the TPM. The application of elasticities in a revised proposal will obviously depend on the new proposal and therefore we do not want to get specific but will respond in a more general sense.

We agree that estimating demand elasticities can be a complicated task that requires empirical data on prices and quantities by market, this being more challenging in electricity space with the intersection of the wholesale market, transmission and distribution networks and retail markets. Long and short run elasticities for end consumers can be estimated using fairly standard econometric techniques, there being considerable literature on how to go about this for both energy and peak demand. Consumers who are direct connected to transmission or distribution networks present a different challenge though we believe that there are data available that can inform an assessment of short term elasticities.

In general, it would be reasonable and feasible to use observed price responses to determine elasticities of demand. There are three possible general approaches that could be used for doing this:

1. Using current information, which implies improving processes for incorporating dispatchable demand into the pricing and dispatch process and which would only reveal the price responsiveness of some consumers.
2. Use detailed observations of past price responses of different kinds of consumers at difference places. These kinds of responses could easily be studied and useful estimates created.
3. Use generalised (e.g. market level) measures of observed price responses by consumers.

A combination of the first and second approaches is likely to be most appropriate for determining benefits. This is because market experience tells us that some consumers are much more price sensitive than others and that capturing that price sensitivity is one important way in which inefficient demand reduction in response to transmission prices can be minimised.

It would be prudent (that is, conservative) to use long run elasticities for a similar reason. This should minimise the probability of inefficient short term demand response.

Options two and three would involve statistical estimates of relationships. This would introduce a point of contention or debate in transmission price-setting. This is largely unavoidable and is also not new. Elasticities form an important part of forecasts of demand growth used, for example, in transmission investment approval processes.

We would again emphasise that very short run (essentially zero) elasticities should not be used as they will not assist to identify the benefit to consumers of transmission. It amounts to treating every MW (half hour) as having the same value as VOLL. As discussed in our report to MEUG, this amounts to assuming that consumers would be willing to pay in the order of $114 billion per annum on electricity, using a $3000/MWh VOLL. This is 80% of total gross national disposable income in New Zealand (approximately $140 billion). The number would be even larger if higher values were assumed to represent VOLL.

Question 44 – regarding the appropriate quantity for charging embedded generation

Matters regarding the application of the SPD approach to embedded generation in behind the grid connection point [or within the distribution network] were discussed at length at the conference. We expanded on our views that, in principle, if benefits accrue to embedded generators then they should be charged for those benefits. There is however a couple of wrinkles to making this "in principle" charging work. The first is how to value the option that the embedded generator has from remaining connected to the grid and thereby having access to the wholesale market should they want to use grid supplied electricity.

The second wrinkle is how to establish the usage quantity that the embedded generator should be charged for. We are of the opinion that charging for net injection/off-take at the connection point is the appropriate quantity, based on the simple and logical argument that they demonstrate their unwillingness to pay to use the grid because benefits to them from doing so are lower than the price charged by Transpower. There are two main ways that a generator can benefit from transmission, it either permits increased generation or raises prices (by providing access to higher priced load). For embedded generation the former is only relevant to the extent that embedded generation results in net injection – i.e. surplus electricity is being sold into the interconnected grid. On the price side of things, if a transmission investment causes an embedded generator to receive higher prices for output than it otherwise would have then there is an incremental benefit to the generator.

The question then is, does this benefit accrue only because of transmission and if so, does the embedded generator benefit on every MW of generation? This does not mean trying to determine whose electrons end up on the grid, but rather it can be understood by considering what happens if interconnection assets fail. In the absence of interconnection, grid connected generators, for the most part, could not operate. The entirety of their production, and hence benefits, is connected to transmission assets. Embedded generators on the other hand would continue to operate, the reason being that they do not necessarily use interconnection assets, by definition.

The best and perhaps only way to tell if or when an embedded generation is a user of the grid is net injection (or offtake) at a point of grid connection. We believe this means that the relevant benefit calculation is the price change multiplied by the net injection (setting aside costs for simplicity). This is the best approximation to benefits from transmission investment for embedded generators. Alternative approximations are possible but one must ask: Is it efficient to charge beneficiaries for a service they do not use?

Question 45 – regarding the potential for vertical integration by generators and retailers under a net injection charging regime

The answer to this question will depend, almost entirely, on the structure of the final TPM proposal that we now await following the consultation round on the October 2012 proposal. Incentives to market participants behind a connection point will emerge from the detail in the new proposal however if transmission charges are levied on a net injection basis we have no special concerns at this time that inefficient behaviour would ensue.

For example if SDP charges were calculated over a trading period on basis of net injection for GIP, and symmetrically net demand for GXP, then parties injecting into or taking supply from the grid over the trading period will do so only if they perceive they derive benefits that exceed their share of SPD charges. If SPD charges are too high then retailers and generators will consider buying and selling power respectively within the distribution network their customers and assets are connected to. Such vertical integration strategies within a distribution network can occur anyway.