

23 September 2015

Submissions  
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### **SUBMISSION ON DEMAND RESPONSE GUIDING REGULATORY PRINCIPLES**

- 1 Orion New Zealand Limited (**Orion**) welcomes the opportunity to comment on the “Demand response guiding regulatory principles” information paper (the **paper**) released by the Electricity Authority (Authority) in August 2015.
- 2 We welcome the paper as an important input to what we consider is an ongoing discussion about demand response. We believe we have valuable insights to offer as an active practitioner in the management of demand response. We also have concerns and questions about some aspects of the paper, and we provide detailed comments on the paper in the appendix.
- 3 Overall our key concern is that the principles are crafted with wholesale market demand response as the main focus, while demand response that is not focussed on the wholesale market is either seen as being at odds with the principles, or its importance is downplayed. In our view the principles either need to encompass all demand response more appropriately, or make it very clear that they only apply to demand response that is specifically targeted on wholesale market outcomes. We prefer the former, more inclusive approach, as the alternative risks losing sight of the value of existing network related demand response and failing to address potential contention.
- 4 We are concerned with the characterisation of key aspects of network driven demand response as not satisfying the principles (via the red shading) alongside the statement that there may be good reasons for this. If the reasons are good enough that the failure to satisfy the principles can be ignored, this rather calls into question the usefulness of the principles, particularly in terms of the third stated purpose: to “provide guidance for stakeholders in planning future demand response initiatives.” (para 1.1.2).
- 5 On that basis we consider that the principles themselves should be subject to consultation, and while we acknowledge this current opportunity for feedback, the principles should in our view have been presented as a draft - with more attention given to rationale and derivation - than in what appears to be final form. In other words it is unclear to us what the Authority will do with the feedback it receives.
- 6 In this sense it appears to us that the principles themselves need a higher level framework for considering demand response in the context of the overall market and regulatory design. We are keen to meet with the Authority to help progress this.

## Insights from our experience

- 7 We believe demand response, and the coordinated management of it, underpins the network (transmission and distribution) side of the industry, which accounts, broadly, for around half the cost and investment.
- 8 Many and perhaps most consumers across New Zealand are participants in demand response. On the Orion network roughly 90% of residential consumers have chosen to have some part of their load managed. We suspect not all consumers understand the exact details of this, but the choice is nearly always driven by, or at least supported by, distributor and retail pricing.
- 9 This coordinated demand response means networks have required less investment than they otherwise would have, and costs to consumers are correspondingly lower. In Orion's case we've built about 150MW (20%) less network capacity than we would have had to in the absence of demand response, and Transpower's grid supplying the upper South Island is also correspondingly smaller. In most cases this demand response does not reduce the total amount of energy delivered<sup>1</sup>, only when it is delivered. Nor does it normally have any effect on the quality of supply as the extent of load management is constrained by service levels.
- 10 Moreover, the existing demand response is taken as a given in our network planning and forecasting. If existing response is undermined in terms of quantity or reliability, this will eventually feed through to increased capital expenditure.
- 11 In our view this context is critically important when the value of demand response, and in particular incremental demand response, is considered. New Zealand is not starting with anything like a blank slate, and care needs to be taken that the slate is not inadvertently wiped clean as we look to write new things on it.
- 12 We consider that the paper assumes a link between the superiority of market outcomes and the relative value of demand response in the spot market vis-à-vis regulated parts of the supply chain. We do not believe there is any such link in principle, and that relative value is an empirical question. As far as we are aware, no relevant comparative analysis has been done, but any such analysis would have to acknowledge at least the history and pervasiveness of network driven demand response.
- 13 We acknowledge that the source of value may move over time, but that is a different point. What should not be assumed is that, if there is a conflict between uses of demand response, those originating from the wholesale market are inherently more valuable than those arising from the networks.
- 14 One of the lessons we have learned over many years is that demand response is one thing, managing that response is quite another. Our load management combines and coordinates the (individually) relatively small amount of demand response capability of hundreds of thousands of connections, and manages the large aggregate effect of all of that in the context of Orion network and / or upper South

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<sup>1</sup> Some larger customers use on-site generation to reduce their contributions to peak demands and this does reduce the amount of energy delivered over our network.

Island total load. This is all driven by an objective of minimising total load within the constraint of service levels.<sup>2</sup> Such an objective is not served by activating all available response at the same time, and it does not require all response to be equally available or individually measurable. Instead the system learns how the aggregate demand will change in response to particular ripple signals. It is by no means clear to us how such a result could be achieved - at all, let alone at the current cost - by the decentralised, uncoordinated actions of all of the responders.<sup>3</sup>

- 15 Like the system operator, distributors have obligations around maintaining security of supply. Increased demand response that we are not aware of both compromises our ability to meet those obligations, and raises questions about the appropriateness of those obligations. Meanwhile, such demand response at a lower level is likely to be overwhelmed and / or completely offset if it occurs at a time when our coordinated load management is active – we will simply, and automatically, turn load on or off to negate the effect.
- 16 A specific example of our obligations is that from time to time we are issued with a security limit by the system operator - one that is lower than the limit we would otherwise control to - and we must ensure that load does not exceed this limit. Because we currently understand aggregate load and available demand response, we can do this. However, if a third party is separately undertaking some form of load management, they are not obliged to meet (and will quite possibly not know about) the limit, and could quite conceivably take action that is in conflict with it. We would either fail to meet our obligations, meet them by exceeding service levels or, in the extreme, turn off customers.

### **Transpower and third-party demand response programmes**

- 17 Transpower is developing its demand response programme, while there are also third parties that do or could procure demand response in the upper South Island. However, we think it is useful if we explain why programmes of this type can present some challenges in our region as this goes to the heart of our wider concerns about coordination. We fully expect to be able to develop a coordinated approach in consultation with Transpower, but we suspect not all third parties will be as transparent or as identifiable.
- 18 Growth in peak demand is the key driver of transmission investment, and Transpower's programme sees demand response as a means of managing peak demand growth so that investment can be deferred or avoided. We agree.
- 19 Transpower's programme, as one example, is focused on very rare events, such as, say, a one in ten year extreme weather event that looks likely to set new maximum demands around the evening (6pm) winter peak. But any such demand response can, in an uncoordinated environment, have the following potentially undesirable features:

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<sup>2</sup> For Orion this means that we limit hot water shedding to no more than four hours in any eight. If we fail to meet the service level, this triggers a review of the target minimum load.

<sup>3</sup> A small number of larger customers do make such conscious decisions, but that response is itself factored into the overall load management system.

- Because other load management will have been used extensively on an extreme a day, it is likely that some of this load will be restored following dispatch of third party response, thereby reducing its effect,
- There is a risk that the demand response simply shifts the peak to the period after the demand response is restored,
- Demand response and restoration can have local (feeder) impact on our network. How will we monitor or even know about this?
- It may be difficult for any party to determine if the response it has procured has not already been dispatched by someone else?

### **Concluding remarks**

- 20 Thank you for the opportunity to make this submission. Orion does not consider that any part of this submission is confidential. If you have any questions please contact Bruce Rogers (Pricing Manager), DDI 03 363 9870, email [bruce.rogers@oriongroup.co.nz](mailto:bruce.rogers@oriongroup.co.nz).

Yours sincerely



Bruce Rogers  
**Pricing Manager**

## Appendix: Detailed comments on the paper

Reference to paper	Orion comment
<p>Para 1.3.2 states that: “electricity efficiency is not demand response because it generally reduces demand at all times...”</p>	<p>Energy efficiency can be valuable ‘response’ when peak day demand is flat, as it already is in the upper South Island. In fact only response that can be sustained over a lengthy period can reduce peak demand on such days. Examples include:</p> <ul style="list-style-type: none"> <li>• heat pumps displacing resistive space heating in a winter peaking area,</li> <li>• more efficient light bulbs (to the extent they are on), and</li> <li>• increased home insulation.</li> </ul> <p>We agree these are not traditionally procured forms of demand response, but that does not stop them being effective. In the end, all demand response comes from consumers, and it can take many forms.</p>
<p>Para 1.4.1: “There is a general trend to increased participation from the demand-side...”</p>	<p>It would be good to put this in context. How much is there now, how much more is happening? What sort of technologies? Where is the value? What is the relative value? These comments also apply to Figure 1.</p> <p>We believe the “non-market” demand response is much, much bigger than the market demand response.</p>
<p>Para 1.5.2.</p>	<p>The spot market may be the primary means of signalling the cost and value of electricity, but that does not mean that it signals the cost and value of delivery, or that the former cost and value is greater than the latter. In terms of marginal cost, peak delivery of distribution is likely to exceed transmission and both are likely to exceed generation.</p> <p>And given that a very large proportion (roughly half) of the electricity supply chain is regulated, New Zealand has already decided that markets are not the best solution for that half, so we need a way to manage conflicts.</p>
<p>Para 2.1.1(a) (i) to (v).</p>	<p>These principles are very focussed on the spot market, which is not necessarily where the most value is.</p>
<p>Green / red colour coding and description of what this means (top of p9).</p>	<p>In our view the principles have to work across the various uses of demand response along the whole supply chain. If there are “good reasons why principles could not or should not be satisfied” then maybe the principles are not good ones and we should change them?</p>
<p>3.1.9: Side payments</p>	<p>But intermediary business models often involve payment for a right to do something that may deliver benefits to the intermediary in a number of areas. Particularly in a world</p>

	where transaction costs are non-trivial, such as small scale mass market demand response, side payments may well be ubiquitous and efficient.
3.1.12.	This concern holds true only if the spot market is the sole source of demand response value. It isn't. Nor is it likely to be the largest.
3.1.14 to 3.1.18.	We note that in a shortage situation the wholesale energy price is an administered price. It is also one that can lead to consumers that are exposed to the spot price paying a VoLL based price for what they do use, while at the same time experiencing VoLL when there are rolling outages.
3.1.24 to 3.1.29.	<p>We find these paragraphs somewhat confusing:</p> <ul style="list-style-type: none"> <li>• Demand response to the spot price where this is not captured in a dispatchable bid is shaded red, indicating it is not consistent with the principles. Surely this cannot be right? A consumer does not need to tell the supermarket at what price they will no longer buy strawberries.</li> <li>• We note that all of these forms of demand response can set the spot price by changing metered demand. This may not be “direct” as conceived in the paper, but it is quite direct nonetheless.</li> <li>• We also note that Transpower and distributor demand response information is available to and could be used in the centralised demand forecast used for dispatch. That is a quite direct influence on the spot price. Even if not used exactly, it should be influencing the central forecast on peak demand days due to its influence on history.</li> <li>• Moreover, if unbid end-consumer demand response becomes material, we would have thought it should also influence demand forecasts.</li> <li>• We are not sure (see para 3.1.25) how any demand response, for whatever reason, can “suppress spot prices below true marginal cost”. The highest price dispatched generator (or dispatchable demand) will still set the price, and that will be the “true” marginal cost. Taken to the extreme, the position in the paper would seem to imply that consumers should not be allowed to respond to the spot price. We don't think this is the intent?</li> </ul>
3.1.38.	This relates to the comments immediately above. Distributor load management is routine (although peak load control does not happen every day). At least in the case of Orion and the upper South Island a reliable (and superior) forecast reflecting load management is available from our load management systems, including a daily revised weather-dependent two day demand profile forecast.

	Distributor load management like that in the upper South Island delivers benefits beyond the distribution and transmission deferral, it can also help defer or avoid investment in grid connected peaking plant. The paper seems in places to see this as a bad thing. We struggle with this logic.
3.1.39: demand forecasting	We are unsure why the demand forecasts would be adjusted for Transpower's demand response programme (an adjustment which in any case may not be accurate if upper South Island load management is occurring at the same time), but not for distributor load management?
3.1.49: rolling outages	During rolling outages the spot price will be administered to a level based on VoLL. This is likely to be much higher than the offer of the last dispatched generator, and no generator offer higher than VoLL should (by definition) ever be dispatched. We are not sure if this paragraph is saying that the spot price during rolling outages is too high or too low?
3.2.14: cost recovery	As the Authority is aware, we have discussed with retailers the idea of a governance arrangement that would allow use of our load management capability to manage aggregate spot market outcomes (we cannot manage individual retailer's load profiles). We have failed to get traction on this, even though we believe it would be economically desirable overall. However, regarding cost recovery, we have tended to think that, at least at first, we would seek to recover just our incremental costs in providing the service. We believe this aligns with the principle. Introducing a suggestion that "full (fixed and variable) cost" must be recovered for alignment is, we submit, a stretch that rather muddies the waters. We think this would be better expressed as "reflects at least the incremental cost."
3.3.3: prices for "controlled" supply	We think this statement is the wrong way around. Most if not all consumers have choices about what pricing plan they are on. What is true is that distributors usually require there to be a relay before they will offer a controlled price, which is really just saying if you want something you have to provide something in return. We would appreciate the Authority clarifying this concern.
3.3.11:	To us, this para confuses feeders with ICPs. All ICPs are on feeders, and in principle any ICP's load (or part of it) can be used to provide instantaneous reserve or respond to price signals. We are not sure how this engages or aligns with the principle of contestability, but during rolling outages the physical ability of an ICP experiencing an outage to provide additional demand response is zero.
3.4.5: when the chips are down	We believe the scarcity pricing regime explicitly suspends or de-prioritises markets because reliability is at risk, that is, "when the chips are down". There may be very good reasons for the regime, but that does not stop it being an

	intervention. You've got to know when to hold them, know when to fold them...
3.6.1: Barriers	Some specific examples would help our understanding of this concern.
Appendix A.2 (g):	It would be helpful to have some examples of greater participation in demand response facilitated by smart meters.
A.2 (k):	We note that Orion has been doing this for many years.