Orion

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Submissions
c/- Electricity Authority
PO Box 10041
Wellington 6143
by email: submissions@ea.govt.nz

SUBMISSION ON ACCURACY OF HOURS-AHEAD PRICE FORECASTS

Introduction

1 Orion New Zealand Limited (**Orion**) welcomes the opportunity to comment on the "Making hours-ahead price forecasts more accurate" consultation paper (the **paper**) released by the Electricity Authority (Authority) in February 2017.

2 In summary:

- We agree that, of the options considered, option A is the best option, at least for now.
- We agree that forecasting of conforming load can be materially improved, and that this will improve price forecasts, *in the absence of any change in unforecasted / unbid demand response.*
- In our view, if the 'better' demand and price forecasts lead to changes in unforecasted / unbid demand response, it is unclear if this is a better outcome overall.
- We revisit comments we have made in previous submissions about the interaction of distributor load management, prices, demand response, and the role of coordination.
- We believe there is a bigger, and much more important picture than that painted in the paper about how distributed energy resources (DERs) are integrated in the wider system.

3 We have not responded to the specific questions in the paper, but we believe our position on those that are important to us is clear from the body of our submission.

Forecasts can be improved

4 Any wholesale electricity market must deal with the inevitable differences[1] between what participants, and service providers, thought was going to happen and what actually happens

[1] The paper in places refers to "errors". "Differences" is, we believe, a more appropriate and neutral word.

Orion New Zealand Ltd
565 Wairakei Road
PO Box 13896
Christchurch 8141
+64 3 363 9898
oriongroup.co.nz

in real time. The way this is dealt with inevitably allocates cost and risk between participants and influences behaviour. Changes to the way differences are dealt with changes the risk, cost and incentives.

5 There are of course physical dimensions to these differences, but there are also financial dimensions. The paper usefully explains and quantifies a number of the key differences and the associated effects. Our comments focus on the role of forecasts of conforming load.

6 We agree that forecasts of conforming load can be materially improved. This is based on our own experience (we use external forecasts as an input to out load management decisions) and as the paper notes Transpower has already established that superior forecasts are possible. (Para 6.2.2)

7 In our own case, one of the forecasts we procure is of "uncontrolled" load. On most days this is the same as the controlled load – because we are not exercising load control. However, on the days that matter, from an aggregate Orion network and aggregate upper South Island perspective, the uncontrolled load is materially more than, or less than the controlled load as load management shifts energy between periods.[2] It is the controlled load that determines actual market demand, and which would need to be forecast accurately from a pricing perspective. The differences between uncontrolled and controlled load can be substantial – up to 60MW for the Orion network and 100MW for the upper South Island.

8 So our load management changes the shape of the load profile across the day compared to what it would have been, and on the coldest days the controlled load profile is virtually flat between 7am and 9pm. But because load management is relatively rare, and varies considerably in extent, it can materially impact on the accuracy of any forecasts that are not aware of it. This has a number of implications:

- An 'unaware' forecast might overstate peak demand and understate minimum demand.
- As a result PRS 'peak' prices might be overstated and 'off-peak' prices might be understated compared to the actual prices that result.

9 We would be happy to discuss how our forecasts and real time load management activity could be incorporated in an improved forecast of conforming demand. This is a concept that we have previously explored/discussed with Transpower. We also note that the Energy Networks Australia Synthesis report on 'Future Market Platforms and Network Optimisation' explores this issue and others. [3] It summarises the options being explored in the United States for role definition and information exchange between the TSO and DSO. Two out of the three options require the DSO to manage localised distributed energy resources (implying also demand management resources) and provide forecasts of resulting load behaviour.

[2] Subject to keeping demand below a network / USI 'limit' while not exceeding hot water heating service levels.

[3] CSIRO and Energy Networks Australia 2017, Electricity Network Transformation Roadmap. Synthesis Report: Future Market Platforms and Network Optimisation. TSO is transmission system operator and DSO is distribution system operator. We only became aware of this paper late in the consultation process so we have yet to fully digest it.

10 While short term initiatives (as proposed in this paper) may be useful, it is this higher level thinking being described in the Australian ENA paper and resulting decisions that will, in our view, deliver a wider range of benefits.

What are demand forecasts for?

11 While we agree that demand forecasts can be improved, and we are willing to assist with that improvement, consideration needs to be given to the downstream effects of this.

12 In essence the current wholesale market model is one where generation is dispatched to meet demand at least cost. In this context the accuracy of demand forecasts is important in ensuring least cost dispatch. In terms of price, the price schedules are best interpreted as: this is what the price will be if (other things equal) the demand forecast is spot on.

13 If consumers then use the 'better' price forecasts to decide on their consumption behaviour in real time, which they are of course perfectly entitled to do, that does inevitably undermine the least cost dispatch outcome, and it also increases the likelihood of material, and increasingly material, variations between forecast and actual prices. It then becomes indeterminate as to whether the better forecasts lead to more efficient dispatch outcomes, and it may well lead to even greater consumer disappointment that the price they thought they were avoiding did not in fact materialise.[4] (So the move from Status quo to option A is not necessarily as depicted in Figure 8.) To be clear here, we are referring to demand response that is not, in the current market model, captured in price responsive bids or otherwise forecast in advance.

14 This is even more of a potential issue as we move into a world where there is more and more consumer owned generation and battery storage. In the extreme, response to price forecasts could potentially create instability in the system.

15 As an aside, we face similar issues as we consider ways that distribution pricing might be changed in response to emerging technologies. While it is certainly true that our pricing can influence behaviour – be it consumption/ production decisions or investment in the technologies which support such decisions – it is less obvious that pricing can lead to better (more efficient) outcomes, particularly if our ability to coordinate load management reduces materially. We are sceptical that such coordination can be achieved via pricing alone.

16 We note the specific mention (in para 4.2.10) of a persistent bias in demand forecasts where actual load is on average 16MW higher than in PRS. We are not sure how material this is in terms of price (and looking at Figure 4 in the paper it appears that it must be very small), but a good forecast should at least be unbiased, and there seems no good reason why a consistent bias cannot be easily addressed, for example by adding (or subtracting) a factor. We note this is listed as a "quick win" in the paper, and we agree. However, this would need to take account of any consistent real-time demand response that might occur.

[4] And further disappointment if they shift the load to a later period which then ends up with a higher than forecast price.

The options

17 We believe Option A has some merit. However, as noted above we believe there is some risk that the potential benefits (which arise from more efficient dispatch) may be offset by the effects of a possible increase in demand response to 'better' forecast prices. Perhaps most importantly we do not consider that Option A closes off any of the other options in the paper, or other options that might emerge in the future.

18 Option B also has some merit, but we agree that it is quite complex. Some of the thinking that has been applied to consideration of allocation of reserve costs could perhaps be applied here, but fundamentally in an environment where consumers might be more and more able (perhaps supported by technologies, including third party technologies) and willing to make demand choices in real time it will likely be very difficult to pin down sources of difference. We are not sure that even well informed retailers can be expected to know how their customers respond in real time, or even if they respond. We also consider that decentralised forecasts are inherently less accurate than centralised ones, and are more inaccurate the smaller the purchaser is.

19 Option C we believe can be left up to participants to organise if they see it is of value. Reasons we do not see it, or much evidence of it, may include the following:

- Parties might be concerned that they would be gamed by counterparties (for example a large counterparty that new it was going to respond in real time), and
- It potentially creates a new basis risk with quantities being settled at hours-ahead prices, but futures, CFDs and other instruments being settled at ex-post actual prices.

20 Option D combines many of the features and problems of the other options. But fundamentally, of all the options, it seems to be most clearly aimed at facilitating real time demand response that is not necessarily efficient. On this basis we urge considerable caution. It is also hard to see an incentive system working where initial positions against which 'errors' are measured is essentially made up. Finally there is the fundamental problem of decentralised forecasts being both less accurate and increasingly inaccurate as purchaser size decreases.

Interaction of load management and price response

21 As we have noted in a number of previous submissions, the load management activity that we and other distributors undertake impacts on the wholesale market, even though that effect is incidental. The forecastable dimensions of this are mentioned above, and we note we are happy to work with other parties to improve the accuracy of demand forecasts. However there is also a dimension that we consider is important to the extent that consumers might respond to forecast spot prices. This is that, because our load management is driven by the actual aggregate load at any point in time, any third party demand response causes our load management system to restore a roughly equal amount of load, offsetting, in an aggregate sense, the individual response(s).

The bigger picture

22 Perhaps our main concern with the paper, and the previous papers on 'real-time pricing' raise similar issues, is that the search for accuracy is too narrow, perhaps even a holy grail.

23 We consider that the best outcome, at least for consumers, is one that coordinates demand response across the day. This in turn suggests at least two things that need to be considered:[5]

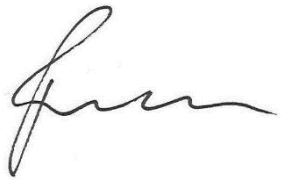
- Whether we have the wholesale market optimisation right – should it be looking at minimising cost across the day rather than in individual trading periods, or fractions of those?

- Which party is best placed to coordinate the actions of consumers as represented by load and the ability of that load to respond?

Concluding remarks

24 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.

Yours sincerely



Rob Jamieson
Chief Executive

[5] And more could well arise from the CSIRO / Energy Networks Australia paper cited above.