Hi Charlie,

Thank you for the opportunity to clarify our position. We have just been speaking to Chris and explained that we tried to keep our submission succinct, focussed directly on the questions asked. We probably should have clarified how our thinking has evolved since pre-SolarZero.

Please find below our answers to your questions (highlighted [bolded]):

Q1. Without doing any investigation, can you confirm it is unlikely you would be able to implement these tool changes by winter 24?

Correct, it is unlikely we would be able to implement the proposed tool changes by winter 2024, but note they are contingent on need – we currently do not have enough interest in aggregated DNL to drive the need.

Q2. Can you please explain what has changed in your assessment of whether and when GXP aggregation or minimum dispatch thresholds would be required?

For example, given solarZero has resources at more than 130 GXPs, would you currently be able to handle bids at all of these GXPs?

Can we assume you have now removed your minimum size threshold but that you may need to reinstate one at some point, or in some circumstances (such as to allow solarZero to participate)?

Lessons from the SolarZero trial have revealed that modelling island-level aggregations of load of this magnitude creates operational difficulties monitoring individual station powerflows. At Takanini for instance, the modelled aggregated DNL load was approximately 20-25% of the actual load being taken at the GXP. Essentially, in real time, the modelling between the market 'required' load and the system 'actual' load did not align, ████████████████████████████████ ████████████████████████████████.

This effect would be a consequence of modelling <u>any</u> aggregations of load at locations on the network where it was not actually taken. However, limiting the size of the aggregations to, for instance, 1 or 2 MW is unlikely to cause the same impact on the coordinators as it would likely fall within the current margin of error between market estimated required load and actual load. So we have a very limited capacity to tolerate aggregated DNL in our modelling without it having an adverse impact on coordinators situational awareness and security management processes.

On the other hand, we cannot currently accommodate DNL bids at 130 GXPs. Our dispatch toolset would be overwhelmed by these additional dispatch units, compromising coordinators' situational awareness in a different way. We have options for mitigating this effect (e.g. reconfiguring the dispatch toolset to present regional aggregations of dispatchable load) but this requires investment, as detailed in our submission.

A further enhancement would be to enable aggregated dispatchable load to exist in the model at a regional reference node that is not otherwise a GXP. This would require considerable investigation to determine current toolset capabilities and design a solution (it is not a current requirement for the model, so it is unknown what changes we would need to make to accommodate this).

Q3. What is the system operator's view on the importance of having price responsive resource visible to themselves and the market, including for winter 24?

For example, considering the above, and assuming tool upgrades will not occur by winter 24, would the system operator prefer, in the interim,
   a. *to have visibility of only a fraction of price responsive resources (for example 9.5 of 35.5 MW of SolarZero's resources) due to minimum size or number of node thresholds*
   b. *to have visibility of a greater quantum of price responsive resources through aggregation across GXPs (for example allowing SolarZero to bid the remaining 26 MW at 13 GXPs, with 2 MW each)*

We would prefer to have visibility of the entire price-responsive capacity. It would be a matter of continuing trial and error to establish how best to effect this within the current model – essentially this is your option (b).

Q4. We therefore would like you to clarify whether you consider, under our proposed solution, you would be able to insure against material operational risk through use of your full suite of application management tools, even if this resulted in only a very small amount of aggregation being possible.

Would there be any circumstance where you would be able to manage aggregation across GXPs such that operational risks would be immaterial? For example,
   a. *assuming you don't have any minimum size threshold, would you accept aggregation across GXPs where a customer has a total of 0.9 MW? We note that you have previously been happy to impose a 1 MW minimum threshold, implying you are happy with up to 1 MW of inaccuracy.*
   b. *If you do still have your 1 MW threshold, would you accept an application for aggregation across GXPs up to 1.1 MW, given your ability to amend or revoke this application, and your ability to assign the node.*

We are naturally inclined to approve applications for DNL participation, even in aggregate, as it gives us greater price-responsive visibility and more capacity resources to secure the system. Our concern is by maintaining the right to revoke or suspend applications, combined with uncertainty about the materiality of the operational risk (lack of lived experience in coordinating aggregated DNL resources), we are negatively impacting the durability of the market design and creating a barrier to entry – we suspect potential participants will be disinclined to participate if there is a possibility that at some point in the future our lived experience means we need to change their mode of participation (e.g. requiring them to supply bids at more GXPs). We do not think potential participants will be comfortable with this kind of experiment. It would be a more robust and enduring solution to upgrade our dispatch tool suite to remove this potential barrier to participation.

Please contact me or ▮▮▮▮▮ if you have any further questions.

Kind regards,

Authority's email to the system operator requesting clarifications

From: Charlie Chrystall <Charlie.Chrystall@ea.govt.nz>
Sent: Wednesday, November 8, 2023 4:11 PM
To: ■■■■■■■■■■■■■■■■■■■■■■■■■
Cc: Chris Otton <Chris.Otton@ea.govt.nz>; Claudia Gonnelli <Claudia.Gonnelli@ea.govt.nz>;
■■■■■■■■■■■■■■■■■■■■■■■■■■
Subject: clarifying position on dispatch notification enhancement

Hello ■■■■■■■■■

We would like Transpower, as system operator, to please provide us some clarifications before we finalise our decision on the dispatch notification enhancement. If you could do so by close of business Thursday 16/11 at the latest, that would be much appreciated.

Firstly, we would like to thank Transpower for their submission on our Dispatch notification enhancement and clarifications consultation. As the system operator is responsible for managing applications, your views are of particular importance to our decision. We ask you please keep this email confidential as we are divulging some of our current thinking regarding our upcoming decision.

We appreciate that you have provided alternative solutions to our proposed enhancement; in particular, your preferred solution of upgrading your tool so any minimum size thresholds can be removed. We would like to discuss this with you shortly. (Note, we acknowledge the minimum size thresholds are not necessarily 1 MW, but for simplicity in what follows, we at times refer to these thresholds as 1 MW limits or barriers).

However, we note that our proposed solution may still provide benefit even if your preferred solution were to be implemented; specifically,
1. in respect of small participants, allowing them earlier entry while they are growing their customer bases,
2. during an interim period in respect of larger participants with resources that are highly geographically diverse.

Before finalising our decision we were hoping you could clarify the following questions

1. Would tool development for your preferred solution be implementable by winter 2024?
2. What has changed in your thinking about whether and when you would need to aggregate or impose a 1 MW barrier?
3. What is your view on the importance of price responsiveness visibility to yourself and the market, including for winter 2024?
4. Could you clarify that you will be able to amend and revoke applications to prevent any material operational risk?

I will provide context for each of these questions below.

Would tool development for your preferred solution be implementable by winter 2024?

In your submission you state that, compared to our proposal, you would prefer to remove any minimum size threshold, and require bids at each GXP where resources are located. However, you state that eventually increased participation will require investment in the dispatch toolset.

Q1. Without doing any investigation, can you confirm it is unlikely you would be able to implement these tool changes by winter 24?

What has changed in your thinking about whether and when you would need to aggregate or impose a 1 MW barrier

In your letter dated 9 June 2023 supporting the solarZero application the SO stated:

> "...This is because the Code seems to anticipate a separate DCLS at each GXP, whereas solarZero will be an aggregator at multiple GXPs across the country. Requiring a separate DCLS to be set up at nearly every GXP across the country would place a heavy burden on modelling, while trading, operating, and dispatching this many stations would be cumbersome and prone to mistake. Particularly, considering many of the GXPs would have a capacity of less than 1MW.
>
> Accordingly, we propose that solarZero be setup as an aggregated dispatch notification purchaser at a single nominated GXP in each island. The total volume of dispatchable load in each island would then be traded at the nominated GXP in that island. We propose the following nominated GXPs:

Island	Max MW	GXP
South	6MW	STK0331
North	24MW	TAK0331

> The system operator has reviewed the impact on our PPOs of establishing solarZero as an aggregated dispatch notification purchaser at single nominated GXPs in each island. We have not identified any security risk, and we have also determined there will be minimal risk on price signals, as the selected GXPs should not be subject to transmission constraints.
>
> If the application progresses, the system operator would reserve the right to increase the number of nominated GXPs if the security risk or price impact becomes material."

In the 29 September 2023 submission on the dispatch notification enhancements you stated that your preferred solution is to:

> "Require all dispatch notification purchasers to bid at a nodal level irrespective of size. Dispatch would be GXP-level dispatch. "

Q2. Can you please explain what has changed in your assessment of whether and when GXP aggregation or minimum dispatch thresholds would be required?

For example, given solarZero has resources at more than 130 GXPs, would you currently be able to handle bids at all of these GXPs?

Can we assume you have now removed your minimum size threshold but that you may need to reinstate one at some point, or in some circumstances (such as to allow solarZero to participate)?

Your view on the importance of price responsiveness visibility to yourself and the market, including for winter 2024

Our proposed changes provide a way around the 1 MW barrier, giving the system operator and the market greater visibility of price responsive resources. We note that significant quantities of price responsive resource may be limited due to the 1 MW per GXP barrier. For example, SolarZero would only be able to bid 9.5 of 35.5 MW. We also note that it may not require much of a barrier for some parties to choose to sit outside the market.

Q3. What is the system operator's view on the importance of having price responsive resource visible to themselves and the market, including for winter 24?

For example, considering the above, and assuming tool upgrades will not occur by winter 24, would the system operator prefer, *in the interim*,
   a. to have visibility of only a fraction of price responsive resources (for example 9.5 of 35.5 MW of SolarZero's resources) due to minimum size or number of node thresholds
   b. to have visibility of a greater quantum of price responsive resources through aggregation across GXPs (for example allowing SolarZero to bid the remaining 26 MW at 13 GXPs, with 2 MW each)

Your ability to amend and revoke applications to prevent any material operational risk

We acknowledge and appreciate your concern for maintaining accuracy of the market nodal modelling. We note in your submission you suggested the limit for aggregation across GXPs would be very small before you would need to restrict participation to prevent unacceptably high operational risks.

You further stated it is not possible to accurately assess the risk of a nominal GXP approach, as there is uncertainty around future connections in terms of both size and location. However, we note that our proposed solution provides you the ability to amend or revoke applications should future circumstances increase operational risks.

Q4. We therefore would like you to clarify whether you consider, under our proposed solution, you would be able to insure against material operational risk through use of your full suite of application management tools, even if this resulted in only a very small amount of aggregation being possible.

Would there be any circumstance where you would be able to manage aggregation across GXPs such that operational risks would be immaterial? For example,
   a. assuming you don't have any minimum size threshold, would you accept aggregation across GXPs where a customer has a total of 0.9 MW? We note that you have previously been happy to impose a 1 MW minimum threshold, implying you are happy with up to 1 MW of inaccuracy.
   b. If you do still have your 1 MW threshold, would you accept an application for aggregation across GXPs up to 1.1 MW, given your ability to amend or revoke this application, and your ability to assign the node.

Thanks again for your the input you have provided prior to and following consultation. We look forward to your response.

Kind regards,
Charlie