

Demand Response Working Group – Meeting Notes

November 15, 2018

Meeting Notes

| Dates held: November 15, 2018 | Time held: 9:00am to 12:00pm | Location: Crowne Plaza, Toronto International Airport |
|--------------------------------------|-------------------------------------|--|
| Company | Name | Attendance Status (A) Attended; (WebEx) Attended via WebEx |
| Alectra | Carr, Daniel | A |
| Cascades | Ross, Jean-Philippe | Webex |
| City of Toronto | Cheng, Jessie | A |
| City of Toronto | Koff, Chaim | Webex |
| City of Toronto | Poto, Angelo | A |
| Cpower Energy Management | Hourihan, Mike | Webex |
| Direct Energy | Cavan, Peter | Webex |
| Ecobee | MacCaull, Aira | A |
| Enel X | Chibani, Yanis | A |
| Enel X | Griffiths, Sarah | A |
| Great Circle Solar Management Corp | Antic, Tina | Webex |
| Great Circle Solar Management Corp | Macabales, Deonnie | A |
| Great Circle Solar Management Corp | Wharton, Karen | A |
| NRG Curtailment Solutions, Inc. | Popova, Julia | Webex |
| NRG Curtailment Solutions, Inc. | Shelly, Christopher | A |
| NRG Curtailment Solutions, Inc. | Vukovic, Jennifer | Webex |
| Ohm Connect | Kooiman, Brian | Webex |
| Power Advisory | Simmons, Sarah | Webex |
| Resolute Forest Products | Degelman, Cara | A |
| Resolute Forest Products | Ruberto, Tony | Webex |
| Rodan Energy Solutions | Goddard, Rick | A |
| Rodan Energy Solutions | Forsyth, Dave | A |
| Rodan Energy Solutions | Quassem, Farhad | A |
| Rodan Energy Solutions | Stewart, Blaire | A |
| ICF Consulting | Goldberg, Sam | Webex |
| Southcott Ventures | Lampe, Aaron | A |
| Rayonier Advanced Materials | Laflamme, Serge | A |
| IESO | Ayres, Matt | A |
| IESO | Campbell, Alexandra | A |
| IESO | Desai, Shilpan | A |
| IESO | Falvo, Michael | A |
| IESO | Fitzgerald, Dale | A |

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| Company | Name | Attendance Status (A) Attended; (WebEx) Attended via WebEx |
| IESO | Gohgari, Zahir | A |
| IESO | Jabbar, Adnan | A |
| IESO | Nusbaum, Stephen | A |
| IESO | Rashid, Fahad | A |
| IESO | Singh, Diljeet | A |
| IESO | Versteeg, Peter | A |
| IESO | Young, Jennifer | A |
| Prepared by Laura Zubyck, please report any corrections, additions or deletions by e-mail to engagement@ieso.ca | | |

All meeting materials are available on the IESO web site at: <http://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Working-Groups/Demand-Response-Working-Group>

Introduction – Jennifer Young, IESO

The IESO welcomed participants and described the format of the meeting.

DR Activation Timeline Proposals – Shilpan Desai, IESO

The IESO led stakeholders through options for providing certainty regarding DR activation timelines.

A participant sought to clarify that the purpose of the update to the DR activation timeline is to provide the participants will some certainty at the 2 hour mark instead of uncertainty around 2.5 hours. The participant asked if the IESO will likely now notify at 2 hours instead of 2.5 hours plus or minus a few minutes.

The IESO clarified that the only change is that report creation will now have an upper bound (i.e. 2 hour mark before the dispatch hour) after which the DR activation notice will not be posted. The IESO also clarified that activation notice will still be targeted at approximately 2.5 hours in advance of the dispatch hour as per present practice.

A participant asked if the IESO has considered testing HDR resources for 1 hour instead of 4 hours.

The IESO replied that it is revisiting its testing criteria in response to stakeholder feedback and it hopes to bring forward a proposal at the next DRWG meeting in February. The IESO noted that proposed enhancements could take effect in May 2019.

A participant asked if the IESO contemplates testing all resources during the same hours or if it would be staggered.

The IESO replied that it would test all resources at the same time to simulate emergency conditions.

DR Registration Updates (Virtual – C&I) - Fahad Rashid, IESO

The IESO led stakeholders through the proposed requirement changes to the contributor registration process.

A participant recommended that, in terms of the proposal to require the LDC statement at the time of registration, it should be an option to submit the Record of Installation (ROI) as it can be a challenge to obtain an LDC statement. The participant also asked if the IESO will require an LDC statement every month or just for registration for record retention purposes.

The IESO replied that it will not request the LDC statement each month but expect Demand Response Market Participants (DRMPs) to obtain a copy for each month and retain those records for audit purposes.

Two participants replied that this is not a business process that is reasonable or commercially viable.

The IESO replied that LDC statements represent a critical part of the audit process, but added that it will take these comment back for consideration.

A participant asked what is the rationale for a seven year retention period.

The IESO replied that the seven years record retention policy is consistent with the existing market rule requirements.

A participant asked if the IESO could perform an audit seven years after an event.

The IESO replied in the affirmative.

A participant noted that the audit process will be reviewed in future DRWG meetings and asked if it would make sense to wait to implement these changes until after the audit process has been reviewed.

The IESO replied that it would take this comment back for consideration.

A participant noted that they have a lot of old equipment and may not always be able to obtain an ROI.

The IESO clarified that it is proposing that the requirement to submit an ROI will be removed and replaced with the requirement to submit an LDC statement. The IESO added that due to the feedback received today, however, it will be reviewing this proposal.

A participant asked if single line diagrams would be required for back-up storage.

The IESO replied that it will take this question back and added that in order to provide some more clarity, it will have to do an internal review on how to deal with embedded storage.

The participant asked where this question would be discussed, at the DRWG or the Energy Storage Advisory Group (ESAG).

The IESO replied that it would plan to discuss this at the DRGW meetings, but added that this discussion could expand further.

A participant asked what the concern was over using KYZ pulse outputs, adding that Measurement Canada allows pulse loggers that are approved by them with an approved meter.

The IESO replied that its concern is around the validation and consolidation of the data. The IESO also commented that if participants have concerns they would appreciate if those could be documented and submitted to help facilitate a broader discussion and help the IESO understand how they can use this data.

The participant followed up by asking the IESO to provide stakeholders with the technical reasons why data from an approved logger would not be allowed.

The IESO replied that it would get back to the participant on this issue.

A participant asked if the Market Manual changes will be brought back to the DRWG for participant comment. The participant noted that some participants may not be aware of the baseline process and asked if DRWG participants can be alerted, outside of the baseline process, that the market manual changes are up for comment.

The IESO replied that it will ensure that DRWG stakeholders will be alerted separately from the baseline process that changes to the Market Manual are available for comment.

2019 DR Work Plan - Alexandra Campbell, IESO

The IESO led stakeholders through initial ideas related to the 2019 DR Work Plan. This included a recap of the 2018 DR Work Plan as well as ideas going forward in 2019.

The IESO asked participants what the most important things are that the DRWG should focus on in 2019.

A participant noted there have been a number of changes that have been discussed or proposed in terms of participation and that it would be useful to have a summary of the proposed rule changes that have been discussed in advance of the next auction.

The IESO asked if this would be done before the auction or the before the commitment period.

The Participant suggested before the commitment period.

The IESO thanked the participant for their comment and suggested that this could be published in the IESO bulletin. The IESO also asked if stakeholders would appreciate a training session be held on the changes prior to the commitment period.

The participant replied that this would be a great idea.

A participant asked for confirmation that there will be no utilization payment and asked when this was decided.

The IESO replied that this was raised as an issue, and after receiving limited feedback it was decided by stakeholders and the IESO that it would be explored in the ICA. The IESO added that they would appreciate more feedback on this topic.

A participant commented that participants are in favour of utilization payments and added that when OPA negotiations were done, utilization payments had to be given up in order to gain other things. The participant proposed that utilization payments should be discussed and noted that as a fairness argument, every resource competing in the ICA should be treated with the same penalties and incentives.

The IESO replied that it is open to further discussions on utilization payments. It added that early in the DR program there were utilization payments only and no capacity payments.

The participant noted that no one wishes to get rid of the capacity payment and added that the fairness argument has a different tone in the ICA context; there are more standards, so there should be a payment for activation just like for other resources.

The IESO thanked participants for their comments.

A participant commented that the DRWG should continue to provide its feedback to the ICA.

The IESO agreed that it was appropriate for detailed discussions on DR to occur with the DRWG, but that issues that touch on the overall ICA design should be discussed in the ICA engagement meetings.

A participant commented that the audit process review and the CM program should be priorities for the DRWG, especially in light of the transition over to the ICA.

The IESO agreed and thanked the participant for their comment.

A participant noted that one of the High Level Design decisions presented at the recent Day Ahead Market (DAM) meeting was that HDR bids submitted into the DAM would be exposed to a DAM settlement and a real-time balancing settlement. The participant expressed concern that since aggregators will be bidding into the DAM with load this topic should be discussed at the DRWG as it has major implications for aggregators.

The IESO thanked the participant for their comment and said it will take this concern back for consideration.

A participant commented that there will be substantial operational changes in 2019 and suggested that the IESO should consider what impact these changes will have and prepare for some unanticipated meetings to discuss.

The IESO thanked the participant for their input and comments.

DR in the Incremental Capacity Auction (ICA) – Stephen Nusbaum, IESO

The IESO led stakeholders through a discussion of how various ICA decisions could impact DR.

A participant commented that DR is one of the quickest resources the IESO can obtain so anything that can be done to open up more opportunity for DR will be beneficial for the market. The participant added that there are also issues with the existing modelling tool in terms of the identification of zones and improving that tool will also help provide more opportunities to DR.

The IESO replied that addressing these issues now comes down to a decision on priority, but added that addressing these issues is a long-term goal.

A participant commented that as the DR program has evolved around the four-hour obligation, certain investments have been made in order to offer that amount of flexibility so if that obligation is lengthened in the ICA the availability of DR resources could be reduced.

The IESO thanked the participant for their input and comments.

A participant asked if the expectation is that there would be a single Minimum Consecutive Hours of Delivery (MCHD) in the ICA.

The IESO responded that it is currently thinking that there will be a single MCHD but added that this will be further discussed and explored in detailed design.

The participant followed up by asking if the MCHD could change from one ICA auction to the next, or if one will remain unless there is a Market Rule change.

The IESO responded that the duration of the MCHD will likely remain constant unless a review indicates a need for a change, at which point the IESO would need to follow the appropriate process for amending the Market Rules. The IESO added that in theory, there would have to be a material change in the supply mix or in the demand profiles to drive a change in the MCHD.

A participant asked if the MCHD would be driven by system requirements. The participant continued that their concern is that DR is conceptually energy limited whereas generation can run as long as there is fuel, so to predicate the MCHD based on an infinite run time for a generator might not maximize the utility of other resources. For this reason, a long MCHD could be a problem for some resources.

The IESO replied that it would determine a process to propose what is required to ensure the capacity procured can meet reliability standards.

The participant added that for an aggregator, increasing the MCHD adds complexity in terms of putting together a portfolio that can participate.

The IESO replied that it agrees and the intent would be to keep the MCHD as low as possible, but added that there must be a balance between making sure the IESO secures the product that is required to meet system needs while minding the implications on the market.

A participant commented that the eight-hour MCHD being contemplated in NYISO is based on a single study, and since its release there has been extensive negative stakeholder feedback. The participant concluded by saying that due to this negative feedback it is unlikely NYISO will pursue the eight-hour capacity duration.

The IESO acknowledged the comment and added that a very long MCHD would be a challenge for some resources and would need to be also viewed from a reliability perspective. Ontario has not yet started the process to determine this and would need to do some analysis before proposing a duration.

A participant asked if the Capacity Check Test is similar to capacity qualification in the DR Pilot, which had a capacity test with a factor to reduce the capacity if a resource did not respond properly.

The IESO replied that notionally this is the same sort of test, where the performance of a resource will impact how much it can offer in the auction in future years.

A participant commented that they would want to reach steady state with operational rule changes before historical performance begins to count towards future Capacity Qualifications in the ICA.

The IESO acknowledged the comment.

A participant noted that Capacity Qualification in the ICA ties into what the definition of a new resource is and commented that the ICA is a completely different product that could require a different portfolio so the incentive and penalty scheme should be created to ensure resources show up.

The IESO acknowledged the comment.

A participant asked for more information about the class average and how it would be created.

The IESO replied by giving an example: suppose there are 20 single contributors, each of 100 MW, that participate in the auction and they all clear. Then, that year, according to the activation and capacity check data, on average those 20 providers are only able to provide 90% of their 100 MW. The IESO would assess that it can dependably rely only on 90MW from that type of resource, so those resources in the future should only get 90 MW. If a 21st contributor comes forward in the following year and says they can provide 100 MW, the IESO would say that the experience shows that the resource is likely to only be able to reliably provide 90 MW. In this case, the first step would be to only apply that 90% in the first year of the new resource and then once that new resource has its own track record of providing 100 MW or more an adjustment can be made and historical data used.

A participant asked how the class average would work for DR resources such as Commercial/Industrial/Institutional or Residential.

The IESO responded that it has not yet gone into that level of detail, but that there would be a class average for each resource. How granular it gets for DR is something that it will need some feedback on in detailed design.

The participant commented that the class average concept sounds like a re-qualifying of the qualified capacity, which they would be reluctant to support.

The IESO replied that this step would come in as part of the qualifying capacity.

The participant commented that determining accurate capacity output is a due diligence requirement on the contributor and is not the responsibility of the IESO. They added that they do not believe historical data will support a real-time average.

Another participant commented that this is an example of using traditional generator design and applying it to DR when there are many differences that exist between the two, for example the lack of consistency between two similar DR participants.

The IESO thanked the participants for their input and comments.

A participant commented that the complication with aggregation is that the mix of participants changes from year to year, or season to season, and the response would also vary because of this.

The IESO thanked the participant for their input and comments and said they would appreciate any additional feedback stakeholders have on this topic. It added that in other jurisdictions' the class average is the starting point and there is a process for refining qualifying capacity further for all resources.

A participant reiterated that the optics of this suggest it undermines the Qualified Capacity. Another participant added that this could be a race to the bottom in the sense that capacity could be de-rated and participants could continue to only provide 80% of their new capacity in each round, resulting in a continuously declining qualified capacity.

The IESO responded that it is anticipated that in the ICA every resource will be required to deliver 100% (not 80%) of what they clear in the auction and clarified that this process would occur in the pre-auction time-frame when they are still determining how many MW can be offered into the auction by a resource.

A participant asked the IESO to confirm that this means a resource cannot bid more into an auction because of their class of resource without testing individually.

The IESO responded in the negative, and clarified that for existing resources the Qualified Capacity will be based on their own data, and that it is only for new resources that do not have historical data that this process is proposed to be used to qualify the participant.

A participant asked if there was historical data suggesting that DR has not been able to meet 100% of their obligation.

The IESO replied that the current DR tests have had mixed results, but added that the way it tests between the DR auction and the ICA will be different.

The participant commented that while some of this sounds reasonable, they do not think it is reasonable to penalize a new resource on the basis of a poor performing aggregator. The participant also asked if a similar process is being contemplated for generators.

The IESO replied that it will be looking at this for all resources, and that generators have similar characteristics; no generator supplies 100% of its installed capacity. The IESO closed by acknowledging that this is a topic that will require more discussion and feedback, and said that the overarching concept is that any resource that participates must have an accurate Qualified Capacity for the auction.

A participant commented that they look forward to discussing the concept of de-rates in detailed design as well as uprates.

A participant suggested that the IESO could separate the concepts of Qualified Capacity and resource adequacy. The participant noted that a resource could clear their full MW in the auction, but the IESO adequacy assessment could adjust the resource down if needed and adjust their price by a corresponding amount.

The IESO thanked the participant for their suggestion and noted that this may be challenging in terms of settlement but said this is something to consider. The IESO also reiterated that this topic is clearly very important to stakeholders and will be a focus in the 2019 work plan.

A participant commented that when compared to generation, the IESO must consider that a generator also receives revenue for energy which is not the case for DR.

The IESO replied that it will bring the utilization payment discussion back during detailed design.

A participant asked if there should be compensation if a DR resource eased congestion.

The IESO replied that this is something to consider.

A participant asked, by only having a pre-defined set of hours, what the capacity product is.

The IESO replied that by having a pre-defined set of hours, it is trying to align the resource adequacy assessment with resource qualification and obligations. It continued that the resource adequacy assessments show when the IESO needs resources, in terms of hours. Following this, it makes sense to qualify resources based on how they perform during those hours which then carries down into what obligations are put on them and how they are assessed. The IESO concluded by saying that it wants to ensure that it targets products so it is only buying what can meet resource adequacy.

A participant asked, in terms of providing feedback as to achieve the right hours, what the product is intended to be. Further, when designing the product, will the IESO be looking back to solve for periods where they were short in reserve.

The IESO replied that it is not just looking backwards it is looking forwards as well at what the supply balance could be in the future. It added that reserve margin and resource adequacy events are not necessarily the same thing, or correlated, so it would have to do some work internally to understand what would be the best approach to determine what those hours might be.

The participant thanked the IESO and concluded by saying they understand this will be dealt with in detailed design but believe things are still very vague and asked if there had been any internal discussions beyond the time period being greater than one hour.

The IESO responded that there has not been any analysis done to understand what exactly it needs at this time so no additional details are available. It added that more information will come in detailed design and acknowledged that deeper discussion will be needed in future meetings.

A participant asked if an eight-hour availability window with a longer deliverability requirement would result in substantially reduced DR capacity procured compared with a four-hour availability window with a one-hour deliverability requirement.

The IESO replied that capacity procurement will generally be driven off peaks and that it does not necessarily follow that a longer window will lead to less DR procurement.

The participant noted that in terms of volume, a longer availability window and deliverability requirement puts a larger burden on an aggregator compared to a shorter availability window and deliverability requirement.

The IESO replied that this is definitely an issue that will be discussed further in detailed design.

A participant asked how the IESO came to the decision to use a pre-defined set of hours without any analysis being done and, without analysis, how can it be sure that this is the right decision for the Ontario system. The participant further commented that the IESO is proposing a methodology akin to a DR auction for a set of hours, while other jurisdictions are moving towards a pay for performance methodology.

The IESO replied that the decision was pay for availability, recognizing that there has to be a discussion in detailed design on the right set of hours to use.

A participant commented that the IESO must ensure that penalties and incentives are equal for all suppliers in the capacity auction. The participant noted that there is no charge today for generators who fail to respond to dispatch instructions, but there is one for loads. If it is transferred into the ICA there should also be a new corresponding charge for generators. Another participant noted that the current penalty factor for DR should also not be transferred over to the ICA.

The IESO replied that it would take the issue of symmetrical penalties and incentives between DR and generators back for consideration.

Accounting for Loads Participating in the ICI and as DR Resources in the ICA – Stephen Nusbaum, IESO

The IESO led stakeholders through a discussion of how the IESO is taking the ICI response and integrating it into the demand forecast, and the implications of loads participating in both the Industrial Consumer Initiative (ICI) and the ICA.

A participant commented that there should not be an issue of accounting for DR resources participating in the ICI because the IESO could adjust the DR resource's qualified capacity based on their participation in ICI.

The IESO responded that reducing the qualified capacity reduces the magnitude of the impact but it does not eliminate the problem because the resource would still be participating on both sides of the equation. The IESO continued that unless two separate products are auctioned, one auction for the 10 highest days accounted for in the ICI, and one for the six months minus those 10 highest days for the ICA, you will always have overlap.

A participant commented that maybe peak power should be a separate product as it is more valuable.

The IESO replied that the participant is welcome to submit this as feedback for consideration, and added that they recognize that there is notionally a difference in value between the 10 highest days and the balance of the year, but squaring out what that difference is, is challenging.

A participant asked if the IESO had discussions with the government on the future of the ICI and what updates might be coming.

The IESO replied there is no update currently.

A participant reiterated that the ICI is a different product which does not have a supply obligation. They continued that there is a historical pattern that can be used but the resource is not bound by any obligation which is a key distinction that must be thought through.

The IESO agreed, and added that the magnitude of the financial incentive in the ICI ensures resources will show up on those highest days, but the challenge is how to account for the way they are treated mathematically.

A participant suggested that because the IESO will know what the response will be from DR for the ICA, it could adjust the estimate based on the ICI. The participant added that the IESO has to assume both will exist or there will be no load in the ICA.

The IESO noted that option 3 on slide 55 covers this suggestion, and added that the concern is that you know that response is going to be there and you are artificially increasing the target capacity and buying more capacity than is needed.

The participant noted that one assumes that, because of past behaviour, when the ICA is being delivered participants are reacting to the ICI and not to their obligation.

The IESO replied that the financial implications suggest this is how it will go, but added that point 2 on slide 55 may offer an alternative to this.

A participant commented that both programs must exist, and co-exist. The participant continued that option 2 on slide 55 introduces a fair amount of risk on the DR participant, and added that a resource would likely still try to capitalize on the peak but might also increase their risk tolerance and only chase it if the demand hits a certain level. The participant concluded by adding that the ICI would also impact the cash flows for a resource and that will figure into their offer.

A participant asked if the IESO, in determining how much resource capacity is needed, takes the projected peak demand and adds reserve capacity on top of that for the entire six month period, in a sense over-buying capacity for most of the six months.

The IESO responded that planners look at a Monte Carlo analysis across the system which is largely driven by peak but not completely.

The participant replied that if this is the case it sounds like the dilemma of allowing DR participants to participate in the ICI and over-buying DR because of this is something that is already inherent to the way the IESO procures power and as such DR will be unfairly penalized.

The IESO thanked the participant for the comment.

A participant suggested that, on slide 55, number one and two will not solve the problem or will increase the price drastically (in the case of number two) and suggested that if the IESO knows who is a Class A and Class B customer they can simply refrain from double counting them when calculating the forecast.

The IESO thanked the participant for their comment.

Conclusion and wrap up – Jennifer Young, IESO

The IESO thanked all participants and that the IESO welcomes feedback from all stakeholders. Feedback should be sent to engagement@ieso.ca.

Meeting adjourned at 12:20 pm.

Action Item Summary

| Responsible Party | Action Item |
|-------------------|--|
| IESO | Bring forward a update on HDR testing at a future DRWG meeting |
| IESO | Review the recommendations for DRMPs to obtain a monthly copy of LDC statements as this would have significant business impacts. |
| IESO | Consider postponing implementation of DR Registration updates until after future review of audit process by the DRWG. |
| IESO | Determine if single line diagrams will be required for back-up storage. |
| IESO/Stakeholders | IESO: Provide stakeholders with technical reasons why data from an approved logger would not be permitted as a means of collecting meter data. Stakeholders: Provide the IESO with reasons why data from an approved logger should be approved as a means of collecting meter data. |
| IESO | Ensure DRWG participants are notified that Market Manual changes are available for comment separately from the baseline process. |
| IESO | Consider publishing proposed rule changes in the IESO bulletin before commitment period. |
| IESO | Consider holding training session for participants on proposed rule changes before commitment period. |
| IESO | Consider discussing the participation of aggregators in the DAM at the next DRWG. |
| Stakeholders | Provide the IESO with feedback on the class average concept as it would apply to an aggregated resource. |
| IESO | Consider the issue of symmetrical penalties and incentives between DR and generators. |

The IESO proposes that the next meeting will be on February 12, 2019, and that stakeholder feedback should be due within two weeks of each meeting.