

Incremental Capacity Auction

July 20, 2017

Minutes of Meeting

| Date held: July 20, 2017 | Time held: 9:00 a.m. – 3:30 p.m. | Location held: Four Points by Sheraton Toronto Airport |
|--|---|--|
| Company | Name | Attendance (A)tended; (WebEx) Attended via WebEx; |
| ABB | Shilpa Kokate | WebEx |
| AMP Solar Group Inc. | Paul Luukkonen | A |
| AMPCO | Rhonda Wright | A |
| AMPCO | Colin Anderson | A |
| APPrO | Dave Butters | A |
| Brookfield | Juilan Wu | WebEx |
| Bruce Power | Pat Dalzell | A |
| Bruce Power | Jennifer Xu | A |
| Customized Energy Solutions | Chris Eich | A |
| Emera Energy | Michel Maddison | WebEx |
| Emera Energy | David Ferguson | WebEx |
| Energent | Douglas Thoms | WebEx |
| Enernoc | Sarah Griffiths | WebEx |
| Goreway Power Station | Rob Coulbeck | A |
| H2O Power | Stephen Somerville | A |
| H2O Power | Ron Medina | WebEx |
| Market Intelligence and Data Analysis Corp | Paul Acchione | WebEx |
| Ministry of Energy | Robin MacPherson | A |
| Northland Power Inc. | Sushil Samant | A |
| NRG | Nekabari Goka | WebEx |
| NRG | Nekabri Goka | WebEx |
| Ontario Power Generation | Lynn Wizniak | A |
| Power Advisory LLC | Alison Cumming | A |
| Powerful Solutions | Peter Inman | A |
| Rodan Energy Solutions | Rachel Ingram | A |
| Storage Power Solutions | Laszlo Lakatos-Hayward | A |
| Storage Power Solutions | Mike Oreskovic | A |
| TransCanada Energy | Margaret Kuntz | A |
| Whisker Labs | Robert King | WebEx |
| IESO | Jason Grbavac | A |
| IESO | Stephen Nusbaum | A |
| IESO | Ismael El-Samahy | A |
| IESO | Warren Hill | A |
| IESO | Barbara Ellard | A |
| IESO | Tom Chapman | A |

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| Company | Name | Attendance (A)ttended; (WebEx) Attended via WebEx; |
| IESO | Ioan Agavriiloai | A |
| IESO | Anthony Clemente | WebEx |
| IESO | Danielle D'Souza | WebEx |
| IESO | Dave Brown | WebEx |
| IESO | Haris Iqbal | WebEx |
| IESO | Rado Jovic | WebEx |
| IESO | Sarid Chagra | WebEx |
| IESO | Sunil Maniyappan | WebEx |
| IESO | Vipul Agrawal | WebEx |
| Scribe: Serena Zhao – Please report any corrections, additions or deletions to scribe at: serena.zhao@ieso.ca | | |

All meeting materials are available on the IESO web site at:

<http://www.ieso.ca/en/sector-participants/market-renewal/market-renewal-incremental-capacity-auction>

Meeting Started at 9 a.m.

1. Introduction & Review of Agenda – Jason Grbavac & Stephen Nusbaum, IESO

The IESO welcomed participants and reviewed today's agenda.

2. Design Element Overview

The IESO representative presented 19 design elements for the ICA covering pre-auction, auction parameters, demand curve, forward period and commitment period. The objective was to ensure stakeholders understood the scope, purpose and linkages between the 19 design elements and the proposed schedule for discussing the design elements during the Option phase.

Pre-Auction Design Elements – Stephen Nusbaum, IESO (Slides 8-24)

- Participation Requirements
- Resource Eligibility
- Qualified Capacity
- Market Power Mitigation

A participant asked if by 'resource' the IESO meant 'facility' referring to the process flow diagram on slide 20.

The IESO clarified that the word 'resource' may be confused with how resource is defined in the market rules. Therefore, future ICA presentations will try to use 'facility' as that is what was intended.

A participant asked how the IESO would deal with an energy storage resource bidding into the capacity auction at zero prices.

The IESO responded that it is normal for some participants to offer capacity at zero prices in order to secure a position in the auction and receive regular capacity payments even if those payments changes over time.

A participant asked for the IESO's rationale with respect to environmental permitting as a condition to eligibility.

The IESO recognizes the need for an environmental permit as part of the regulatory/approvals process for building a facility. There will be further discussions, during the "options phase", in regards to the time at which those permits would be required; i.e., as part of the resource eligibility process and/or the performance obligations during the forward period.

A participant asked how a participant like Hydro Quebec could participate as a capacity import. Usually HQ doesn't associate capacity to a specific facility (rather it is sold from their entire supply mix). Will this be an option for the Ontario auction?

The IESO responded that this is one of the options the IESO needs to discuss as part of the ICA design process. Together with participants, the IESO will look at the qualifications and requirements for imported capacity. Ultimately, the goal is to ensure that it is able to meet system adequacy requirements in Ontario.

Auction Parameters – Ismael El-Samahy, IESO (Slides 25-42)

- Length of Forward Period
- Commitment Periods
- Multi-year Commitments
- Locational Considerations

A participant asked for a clarification between what is meant by a spot auction, forward period and rebalancing auction.

The IESO explained that in a spot auction the commitment period begins immediately or very shortly after the auction has taken place. A forward period refers to the period of time between the 'base' auction and the beginning of the commitment period (typically 3-4 years). Rebalancing auctions may be held after the base auction and provide an opportunity for both the IESO and participants to respond to changing conditions by adjusting the quantity of MWs with Capacity Obligations for a given commitment period. The main difference between a rebalancing and spot auction is that a rebalancing auction allows participants who had commitments coming out of the base auction to buy out of their position.

A participant asked if the IESO has already explored the length of the forward period.

The IESO responded that in the fundamentals phase, no decisions have been made. The purpose here is to ensure everyone understands the elements and some of the considerations and trade-offs. We will work with stakeholders to determine the design most appropriate for Ontario during the next phase. To be clear, the IESO is not planning to go away and design the ICA elements between meetings without stakeholders' input. We will bring proposals and ideas to the ICA SE, and stakeholder feedback and input will be critical to the design. If stakeholders need additional information or analysis to comment, this needs to be communicated as well.

A participant commented that since this is an incremental capacity auction, we are not trying to build new capacity, so maybe the forward period could be done in a shorter period of time instead of 3 to 4 years.

The IESO responded that the forward period in the first auction may not have to be 3 to 4 years as the incremental capacity needs are expected to be small and mainly acquired from existing resources. As contracts expire and future needs emerge, more capacity will need to be procured from new build resources and the appropriate forward period should reflect that.

A participant asked how the varying lock-in terms contingent on the type of resource that clears (used in Britain) are determined. (Slide 36)

The IESO responded that there are variations on the design of the price "lock-in" mechanism in the jurisdictions that have implemented multi-year commitments. The IESO will look into the specifics on Britain and provide more details in the options phase.

A participant asked if the IESO could consider developing lock-in periods based on resource-type.

The IESO responded that these are important design questions; that will be addressed in the options phase.

A participant asked what percentage of contracted capacity would be expiring when and how much of this capacity would end up going through the capacity auction.

The IESO responded during the last ICA meeting (June 15th), the IESO presented a graph showing the difference between contracted/regulated capacity and total system need looking out several years. As demand grows and contracts expire, the IESO would expect the capacity to be picked up in the auction.

A participant asked a follow up wanting clarity about whether or not as contracts expire that previously contracted capacity would move into the capacity auction?

The IESO responded that the specific resource will definitely become eligible to participate in the auction. For example, if there is a 1000 MW gas generator coming off contract, our expectation would be that that generator wouldn't get another contract. Instead it would participate in the auction. However, we need to be sensitive to the fact that there may be certain strategic larger scale resources for which the auction might not be the right mechanism when a contract comes up or the resource is no longer regulated.

A participant asked if there is a process for determining how and when that kind of determination is made (i.e., suitability of auction for certain strategic assets) and will this forum be part of that process?

The IESO responded that this is an issue that has been raised at this forum and others but we need to be cognizant that the provincial government will have some role in this area; this is part of the 'Big G' governance issue that's been identified. When it comes to things like bilateral deals with neighbouring jurisdictions outside of the ICA or whether it's renewing/reinvesting in major assets like nuclear plants, we have to recognize that government is always going to have a role in those decisions. In terms of the auction, it's very important that if it becomes clear that when we are procuring MWs through the auction, we don't want them to suddenly disappear overnight and be given to another resource/jurisdiction. The goal here is to put in place an auction mechanism which demonstrates its value and that can mitigate the need or desire to pursue making out-of-market decisions around the supply mix. That governance question is one that we recognize is important and we're starting to have some discussions around that especially at the MRWG level, but it's something we are going to have to continue to explore.

A participant asked how transparent will the IESO be in determining the Target Capacity that will be secured in the auction. In addition to waiting for the IESO to set the Target Capacity based on the conditions only known to them, will stakeholders see the details of when contracts are ending and the inputs that go into determining the Target Capacity ahead of the auction?

The IESO recognizes the importance of transparency in determining important auction parameters. The IESO has already begun to have discussions about these types of issues especially with the Market Renewal Working Group (MRWG).

Demand Curve – Ismael El-Samahy, IESO (Slides 43-64)

- Slope of Demand Curve
- Target Capacity
- Min/Max Capacity Limits
- Net Cost of New Entry
- Max Auction Clearing Price

A participant asked why, if the target capacity requirement is 100% of the need, we would procure 5 or 10% extra on top of that? (Slide 48)

The IESO responded that there are various reasons why we may want to procure more than the target capacity. First, the target capacity is a forecast (i.e., there will be some uncertainty about the 100% number). Second, there will be some uncertainty in terms of the actual performance of those procured assets when required. In other words, there is potential insurance value by going beyond 100%. In addition, depending on the steepness of the downward sloping curve, clearing farther to the right (i.e., at a lower clearing price) could actually mean more than the target capacity is procured at a lower total cost.

A participant asked a question regarding a report (Ontario Reserve Margin Requirements 2017-2021) on slide 51. Is there a place to check what the contracted/regulated contribution in each

year is, or would that be a new product that the IESO would have to provide? The participant also highlighted that stakeholders would like to understand what amount of detail will be included.

The IESO responded that the target capacity for ICA would be published before the auction. As part of the design process we will consult on what level of detail stakeholders need and on what level of detail the IESO is able to provide.

A participant asked a question about the assumptions that the IESO will use to set the Net CONE as one of the auction parameters: will the IESO provide the background for the reference resource, energy and ancillary services revenue assumptions and calculations for the reference resource?

The IESO responded that the process to establish Net CONE is an important design feature and the assumptions that go into Net CONE when established will be communicated to the participants to ensure transparency.

A participant asked whether the stakeholder community would have the chance to participate in the methodology associated with the determination of the Net CONE.

The IESO indicated that this engagement is meant to be the vehicle for design of the ICA. The “options phase” will start in August, where options for each design element will be discussed in greater detail and we will be seeking feedback to develop preliminary design decisions including determining the net CONE. The IESO recognizes the importance of this issue for stakeholders. It is important to note as well that the methodology used may evolve over time and the reference units may change.

Further to the question above, is the IESO planning on bringing in a third party to potentially review and approve the process of determining the Net CONE?

The IESO responded that further discussions will be needed on this process and that it may be useful having a third party to ensure the independence and transparency of the process. The IESO will bring the discussions back to MRWG and ICA.

Forward Period – Ismael El-Samahy, IESO (Slides 65-78)

- Rebalancing Auctions
- Resource Obligations (within forward period)
- Non-performance Implications (within forward period)

A participant asked whether and how the IESO tests resources (especially new technology such as storage) to understand how they perform *before* writing rules and policies for their participation.

IESO commented on the importance of having engaged stakeholders in order to hear from those who are familiar with and operate certain systems or technologies so that we can learn from them. On the operational side, the IESO has run pilot programs and undertaken grid impact assessments to understand

the impacts of new technologies. The IESO also has a series of checks and balances in place to test rule proposals and changes. This includes stakeholdering market design and rules through the SE process, as well as a review by an independent Technical Panel for any market rule changes. These forums provide stakeholders with an opportunity to help the IESO to better understand unique characteristics that affect their operation and impact on the market.

Commitment Period – Stephen Nusbaum, IESO (Slides 79-93)

- Resource Performance Obligations
- Performance Assessment
- Cost Recovery

On the pay-for-performance assessment, a participant asked for clarification on the ‘scarcity events’ and whether they would be evaluated seasonally or annually. (Slide 85)

The IESO explained that specific mechanisms for assessing performance have not yet been developed and will be explored in the options phase. In general, if performance were to be measured against actual performance during scarcity events, the triggers for those scarcity events would be established in advance and would only occur during the relevant Commitment Period for which a participant has a capacity obligation.

3. Design Element Linkages and Proposed Schedule – Stephen Nusbaum, IESO (Slides 94-101)

The IESO explained the linkages between design elements and sought feedback on a draft options phase schedule.

A participant suggested moving the locational-based auctions to be discussed on August 16 due to its strong link to the demand curve design elements.

The IESO responded that they will take it back and consider it. Some aspects of Locational Considerations are very much tied to the Demand Curve Design Elements, however other aspects are related to other design elements. To the extent appropriate and possible, the IESO committed to trying to ensure locational considerations are addressed during the August 16 meeting.

4. Auction Mechanics – Ismael El-Samahy, IESO (Slides 102-108)

A participant asked what would happen if someone bids their capacity at a price a bit under the demand curve in the auction, assuming the capacity offers perfectly match up with the demand slope.

The IESO responded that all capacity that clears will receive the clearing price on the demand curve. As long as a bid is above the minimum MW requirement and the auction clears around the target capacity range this is not a problem. In addition there is the forward period and rebalancing auction to capture the difference if the target is not met in the base auction.

A participant asked, in comparison to U.S. jurisdictions, what checks and balances will there be to ensure that the engine can perform properly.

The IESO recognizes that there needs to be confidence and trust for stakeholders which the IESO takes very seriously. The audit of the Demand Response Auction Engine by the Brattle Group was given as an example for such checks and reviews. The IESO is also planning to explore what other jurisdictions have done.

5. Capacity Trade Introduction – Warren Hill, IESO (Slide 109-124)

A participant asked a question regarding wheeling capacity through Ontario in the past. If you can't guarantee that energy transaction all the time (due to the IESO's ability to curtail), how can you sell that capacity on a guaranteed basis to other jurisdictions? Has there been any thought on this wheeling issue for installed capacity?

The IESO responded that consideration had been given to capacity wheel throughs. Under the current energy wheel through process, the IESO can still cut the energy transaction if it is necessary to deal with an adequacy shortfall or to avoid a nuclear shutdown. If capacity were wheeled through, the IESO would have to guarantee that the energy would be deliverable unless a reduction was necessary to manage a transmission limit. As such, the IESO would be essentially reserving intertie space on both the import and export interfaces for wheels during an adequacy short fall, reducing our ability to manage the grid. As such, the IESO will not allow wheel through capacity at this time.

A participant asked if a participant would need to qualify their capacity for the auction in the other jurisdiction. They also asked if the capacity was traded in the NYISO auction, whereas the associated energy would need to be managed through the IESO and NYISO markets, or would the energy aspect be covered under a Physical Bilateral Contract (PBC)-type arrangement.

The IESO responded that, yes, the participant would need to register as a participant for capacity in the other jurisdiction. As a part of that process, they would need to fulfill the requirements to qualify their capacity in that market. With regards to the associated energy, any such transaction would need to be scheduled through the appropriate markets, and would not be a PBC type arrangement.

A participant asked if a demand response resource in Ontario such as a dispatchable load would be automatically approved to export given that they are not included in resource adequacy assessments.

The IESO responded that currently no jurisdictions include demand response from another jurisdiction as capacity eligible for import. If this is changed in future, the IESO would need to consider what checks would be required to appropriately review such an export request.

6. Next Steps

Action Item Summary

| Date | Action | Status | Comments |
|---------|--|--------|----------|
| July 20 | The IESO will look into the specifics regarding the price “lock-in” mechanism on Britain and provide more details in the options phase. | | |
| July 20 | The IESO will bring the discussions back to MRWG and ICA regarding having a third party involved in the process of determining NetCONE. | | |
| July 20 | The IESO will consider having locational considerations addressed for the August 16 meeting. | | |
| July 20 | The IESO will explore what other jurisdictions have done to ensure there are proper checks and balances for the performance of the auction engine. | | |

The IESO thanked participants and reiterated that feedback is appreciated and should be sent to: engagement@ieso.ca by next ICA meeting.

Next ICA Meeting is August 16, 2017.

Meeting Adjourned at 3:30 p.m.