

# February 24, 2021 Energy Storage Engagement Stakeholder Session Minutes



**Date:** February 24, 2021      **Time:** 9:00 a.m. – 11:00 a.m.

**Location:** Virtual

## **Companies Represented by Attendees:**

Aecon Group Inc.  
AESO  
Alberta Ministry of Energy  
Alberta-Pacific Forest Industries Inc.  
AltaLink Management Ltd.  
ATCO Electric Ltd.  
Alberta Utilities Commission  
Aura Power Renewables Ltd.  
Battle River Power Coop  
Becker Project Management Services Inc.  
BECL and Associates Ltd.  
Best Consulting Solutions Inc.  
BHE Canada  
Bird Construction  
BluEarth Renewables Inc (“BluEarth”)  
BowMont Capital and Advisory  
Canadian Renewable Energy Association (“CanREA”)  
Capital Power  
Capstone Infrastructure Corporation  
Carlotta Energy  
Castle Crew Advisory  
Consumers’ Coalition of Alberta  
Chapman Ventures Inc.  
CIBC  
Citrine Management & Consulting Corp  
City of Edmonton  
Credit Suisse  
Customized Energy Solutions  
DePal Consulting Limited  
Direct Energy  
Doherty Engineering Inc.  
ECO Renewables Corp.  
ECO Systems Inc.  
EDF Renewables Canada  
Edison Energy  
EfficiencyOne  
Electrical Inspectors Association of Alberta  
Enbala Power Networks  
Enel Green Power North America  
Energy Storage Canada  
Enlighten Innovations Inc.  
ENMAX Power Corp.  
Eolectric Development Inc.  
EPCOR Distribution and Transmission Inc. (“EDTI”)  
Electric Power Research Institute  
EQUUS REA LTD.  
Federation Engineering  
Flint, a member company of ClearStream Energy Services Inc.

FortisAlberta Inc.  
 Gagnon Professional Services Ltd.  
 General Land & Power  
 Government of Alberta  
 Green Cat Renewables  
 Guidehouse  
 Hartigen Solutions  
 Heartland Generation Ltd.  
 HEP Energy Canada Ltd.  
 HITACHI ABB Power Grids  
 Hydro One  
 Imperial Oil  
 Invinity Energy Systems  
 Industrial Power Consumers Association of Alberta  
 Independent Power Producers Society of Alberta  
 Kiewit Corp.  
 Kilo Power Inc.  
 Madstone Energy Corp.  
 Market Surveillance Administrator  
 Mirastar Energy  
 Municipal Climate Change Action Centre  
 NextEra Energy (“NextEra”)  
 NextEra Insights Inc.  
 North American Environmental Markets Inc.  
 Northstone Power Corp.  
 Nutana Power Ltd.  
 Office of the Utilities Consumer Advocate  
 Ontario Ministry of Energy, Northern Development and Mines  
 Pathfinder Consulting Services  
 Peters Energy Solutions Inc.  
 PGC0  
 Power Advisory LLC (“Power Advisory”)  
 Powerex Corp.  
 Prairie Sky Strategy  
 Power System Innovations, Inc.  
 Rally Engineering  
 Renewable Energy Systems Canada Inc.  
 RMP Energy Storage, Inc.  
 Rodan Energy Solutions  
 RVM Developers Inc.  
 SABR Energy Consulting Inc.  
 Scott Land & Lease Ltd.  
 Stantec Consulting Ltd.  
 SunAlta Power Inc.  
 Suncor Energy Inc.  
 Suncor Energy Marketing Inc.  
 TERIC Power Ltd.  
 TransCanada Energy Ltd.  
 TransAlta Corporation  
 Trigen Solutions Inc.  
 Turning Point Generation  
 University of Calgary  
 URICA Energy Management Corporation  
 Wartsila  
 WestRiver Industrial Inc.

## Consultation Session Overview and Introductions [Slides 2 to 10]

The AESO welcomed stakeholders to the session, provided Zoom instructions, the AESO's stakeholder engagement framework, and stakeholder participation expectations.

The AESO noted that an audio recording of the first part of the session, the AESO Energy Storage Roadmap update, will be posted on the AESO website.

The AESO also noted that the information presented in the second part of the session, the AESO's long-term energy storage market participation recommendations, is related to ISO rule development and as such, meeting minutes of the second part of the session will be prepared by AESO staff and made available on the AESO website.

The AESO presented its agenda and introduced its speakers.

## Energy Storage Roadmap [Slides 11 to 31]

The AESO updated stakeholders on its Energy Storage Roadmap activities.<sup>1</sup>

## Long-term Energy Storage Market Participation Draft Recommendation

### Introduction [Slides 34 to 41]

The AESO presented the Energy Storage Roadmap pillars and explained that its market participation recommendations fit within the markets pillar.

The AESO further explained the scope of the market design component of the markets pillar, and the objectives of the session, which include presenting its market participation recommendations, as described in the *Long-term Energy Storage Market Participation Draft Recommendation Paper*, and providing stakeholders with an opportunity to ask clarifying questions.

The AESO presented the design principles it used to analyze and assess market design options.

Following up on a stakeholder question received at the October 14, 2020 Joint Stakeholder Engagement Session on Energy Storage and Distributed Energy Resources<sup>2</sup> regarding whether the AESO had undertaken a jurisdictional review, the AESO summarized its findings from its review of other jurisdictions. The AESO noted that the Alberta electricity framework and related energy only market is different than other jurisdictions, so it is difficult to apply lessons learned from other jurisdictions to Alberta.

The AESO then gave a brief overview of its recommendations.

### Recommendation 1 – Allow Hybrid Asset Configurations and Variable Energy Resource (“VER”) blocks [Slides 43 to 47]

The AESO presented its recommendation that hybrid assets be allowed to participate in the market and went through the alternatives considered. The AESO also provided examples of how this would work. Several stakeholder questions that prompted further discussion about Recommendation 1, which is summarized below.

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<sup>1</sup> An audio recording of this part of the February 24, 2021 Energy Storage Stakeholder Engagement Session can be found on the AESO website.

<sup>2</sup> The October 14, 2020 Joint Stakeholder Engagement Session on Energy Storage and Distributed Energy Resources presentation and audio recording is available on the AESO website.

### ***AESO's visibility on the operational potential of the VER block***

EPCOR, referencing Slide 46, asked a question about how the AESO will utilize the real-time state of charge (0-100%) to help discern the operational potential of VERs without also having the rate of charge/discharge available to understand for what duration the VER is unavailable/available to be resourced. EPCOR asked if the answer is that the rate of discharge is packaged within the offer block structure.

The AESO responded that EPCOR is correct, the AESO is not looking at duration when dispatching a block of energy, particularly from an energy storage asset. The AESO noted that this is what makes the Alberta energy market unique from other markets, that in Alberta, megawatts are dispatched, and the market participant can provide those megawatts until it can no longer provide them.

The AESO further explained that this was how the AESO implemented market participation for energy storage assets in the short-term: when energy storage first started connecting to the interconnected electric system. The AESO explained that it expects operators of energy storage assets to provide its energy until it can no longer provide it.

The AESO gave an example of a 50 megawatt ("MW") dispatch of an energy storage asset, noting that the operator would be expected to provide 50 MW until some point in time until it could no longer provide that energy, and that, at that time, the energy storage asset's state of charge would drop to zero. The AESO noted that when the asset's state of charge dropped to zero, the operator would have an ability to restate its energy.

The AESO added that, with hybrids, this becomes a little more complicated; for hybrids there is a permissible range in which the block can operate within. The AESO explained that it adds the dispatch tolerances to either side of that range and, effectively, if the energy storage asset stays within that range, it is within the allowable dispatch variance of that dispatch. The AESO referred to its 50 MW example, noting that, in that case the allowable range would be 0 to 50 MW.

### ***Allowable variance size***

BluEarth asked if the allowable variance will match the size of the storage.

The AESO responded that the VER block would match the capacity of the variable energy resource, not the energy storage resource. The AESO further noted that there has been some discussion internally at as to whether the VER block should be based on the actual available capacity of the variable energy, wind or solar on site making it a value that can be restated. The AESO added that it thought, at this point, it would keep the value a simple static value rather than making it a complicated biddable piece of information, noting that if a market participant changed the configuration of its site, then the VER block would change based on the change in the configuration of its site.

### ***Operators decision-making power regarding how to charge***

CanREA, also referencing the second example on Slide 46, asked if the AESO dispatches block 0 and is "expecting between 0 and 15 MW", if that is net of the energy storage asset's charging volume. CanREA also referenced a line in the *Long-term Energy Storage Market Participation Draft Recommendation Paper* that said the operator can choose to charge their facility at any price.

CanREA further asked whether the operator can make its own decision about how to charge.

The AESO confirmed that it was leaving it up to the market participant to operate within their range. The idea being that if the sun is shining or the wind is blowing, that 100% or a portion of the energy could flow from the VER into the battery and the AESO would leave it up to the operator to decide what portion would be applicable there.

The AESO noted that there is a caveat that was mentioned in the paper and is not covered in Slide 46 and is that, obviously, if the energy storage resource is already at 100% state of charge, and that is shown through the data, it is then expected that the wind production will go net-to-grid.

The AESO further explained that if the storage resource is anything less than that, then obviously the operator is completely within its variable range to operate wherever it chooses to noting that the other

thing would be if the wind output is greater than the capacity to charge the battery, so in other words, if the wind was blowing at a full 15 MW, and the battery could only take 10 MW at that time, the AESO would expect the remaining 5 MW to come to the grid. In that case, the AESO has all that information that it needs and could use as part of the system controllers decision making process, on what the system controller would expect to see net-to-grid when a dispatch is issued. The AESO noted that from a variance perspective, the AESO would allow the variances to be quite broad while dispatched within the VER block.

### ***Supervisory Control and Data Acquisition (“SCADA”) Requirements***

CanREA asked for clarity regarding the SCADA requirements for hybrid systems. CanREA added that the AESO made clear the state of charge information requirement for standalone assets that are participating in the full-range participation option was clear; however, the requirements for other assets is not.

The AESO clarified that there are technical ISO rules that apply specifically to certain technologies, regardless of their asset configuration, so if storage is installed on the grid, there will be technical requirements for energy storage, regardless of their asset configuration. The AESO further explained that currently, technical requirements regarding energy storage resource’s state of charge are covered when the energy storage resource’s requests a connection to the interconnected electric system.

### ***Recommendation 1 Rationale***

NextEra asked if the AESO’s recommendation is a way of stretching the block and then measure its performance and also asked if it places any particular constraint on the market participant or if it is something the AESO is doing it to give operators the visibility of each asset. NextEra added that is it trying to understand the constraints or limitation to the market participant.

The AESO responded that its recommendation is the most flexible of the options that were considered, and it really comes down to what the market participant chooses to offer that drives its compliance behavior. The AESO noted that if a market participant were to spread its VER block across more of its dispatchable range, then it would be like Example One, the market participant can be dispatched higher up the merit order and have high range, but there is a point in time where the AESO will expect some of the discharge from the energy storage resource to occur, and it would be submitted net-to-grid, once the market participant is through its VER block.

The AESO added that the proposed model is a novel way in which to do dispatch compliance that is more flexible than the current, more restrictive methodology. The AESO noted that the current methodology limits the ability for hybrid assets to be price takers. If the market participant is dispatched and puts a portion of its energy in block zero and the AESO dispatches that block, it would be a requirement to put energy onto the grid. The AESO currently bases its dispatch compliance on meteorological data for wind and solar VERs.

## **Recommendation 2 – Optional full-range participation, linked assets, or must communicate requirements [Slides 48 to 55]**

The AESO presented its recommendation to give market participants the option of full-range participation using linked-assets submissions and went through the alternatives considered. The AESO also provided examples of how this would work. Several stakeholder questions that prompted further discussion about Recommendation 2, which is summarized below.

### ***Connection to ISO tariff***

Capital Power asked how the AESO saw the “must-communicate” option integrating with potential forthcoming ISO tariff recommendations, if at all. Capital Power noted that it looked like an interruptible rate based on market participation may attract energy storage to participate by bidding its range and providing that additional visibility, but there may also be incentive just to avoid the additional obligations, if the fall back is must communicate.

The AESO responded that it realizes that there are two price signals out there: one for the ISO tariff DTS pricing; and the other for the energy market pricing. The AESO noted that, in its view, it would be another

reason why it is an option for market participants to bid. The AESO would like to incent that behavior; however, the AESO recognizes that sometimes there could be competing price signals, and sometimes those price signals are complimentary, and they work together. The AESO added that the expectation is that the market participant would follow the ISO rules, and it wouldn't be building mechanisms like restatements for the purposes of the ISO tariff inside the ISO rules. The AESO noted that it does not think that it would see anything like that, if that was what Capital Power's question was.

Capital Power also asked if the AESO would be open to extending the stakeholder comment period<sup>3</sup> given the AESO's plan to unveil its proposed ISO tariff, including energy storage treatment, around the same time stakeholder comments are due.

The AESO said it would consider extending the stakeholder comment period and would get back to stakeholders on its decision.<sup>4</sup>

### **12 Coincident Peak ("CP") and adjusted load on the margin proposal**

RMP Energy Storage Inc. asked why an owner of an energy storage resource would choose to participate in the full-range option and risk being called on to charge during 12 CP, because it is difficult to predict when the 12 CP will occur, and the owner would be exposed to economic impact per the ISO tariff. RMP Energy Storage Inc. explained that the risk on one side, if the energy storage asset is charged during a CP hour, even one out of twelve times, is that there would be a potential revenue stream loss; on the other side, if the energy storage asset does not charge and the CP hour does not occur, then there may be a lost opportunity. RMP Energy Storage Inc. surmised that the end result could be that the market participant is unable to get financing for its facility.

The AESO responded that it is going to create the structure for bids similar to the structure for offers and if the operator of an energy storage resource is anticipating a 12 CP condition, it can restructure its offers in near real-time to ensure that its not charging during a 12 CP hour. The AESO added that it is within the operator's control through its offer strategy to modify its offer to best suit its operation. And so, if it does not make sense to charge while in CP hour, then the AESO would expect that its bid would not put the asset in a position to do that.

The AESO noted that the other component its exploring is around adjustments for load on the margin, recognizing that having storage bid, or even loads bid into the merit order, creates some certainty, which has some value and may counteract some of that increased risk.

RMP Energy Storage Inc. responded that it thought that an interruptible rate would afford the AESO the same visibility and value the AESO described as being the desired outcomes of having storage bid in charging operations.

## **Recommendation 3 –State of Charge Requirements [Slides 56 to 58]**

The AESO presented its recommendation to create a new defined term, 'state of charge', for use in the ISO rules and to require the legal owner or operator of an energy storage resource to manage its own state of charge. Power Advisory asked a question regarding the Recommendation 3 rationale, the question and the AESO's response is summarized below.

### **Recommendation 3 Rationale**

Power Advisory asked if part of the reason why the state of charge is being collected in real time is to guard against situations where market participants are not able to perform as they said they are able to perform and claim state of charge.

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<sup>3</sup> Reference to the AESO's Letter of Notice, date February 17, 2021.

<sup>4</sup> The AESO posted a letter notifying stakeholders that it had extend of stakeholder comment deadline from March 17, 2021 to March 31, 2021. The update was posted on the Energy Storage ISO Rules Amendment webpage on March 1, 2021.



The AESO confirmed Power Advisory's conclusion and noted that there two reasons the information is important: one, state of charge becomes very useful for the system controller and, two, for dispatch compliance. The AESO also added that restatements are only permitted when state of charge is at either 100% or 0%. For compliance, the AESO needs to have the state of charge available to look back and see if that restatement was for legitimate reasons.

## **Recommendation 4 – Revise commissioning rules to better reflect energy storage requirements [Slide 59 to 61]**

The AESO presented its recommendation that the ISO rules related to commissioning be amended to include requirements for energy storage resources. Capital Power asked a question regarding the commissioning process details, the question and the AESO's response is summarized below.

### **Commissioning Process Details**

Capital Power asked if a market participant elects to participate in full-range after it has been commissioned as a half-range participant and asked how that process would work for those who elect to participate as half-range and full-range.

The AESO confirmed that would be possible, that there is an AESO process in place to manage that change. The AESO also noted that the market participant would also be able to flip from half-range to full-range or revert back again and reiterated that the change would have to be applied through the AESO process previously mentioned.

The AESO also clarified that it wouldn't expect market participants to bid when commissioning; however, would make sure the ISO rules are written to reflect that. The AESO added that when it was looking at the ISO rules, it was looking at how to make sure that the market participant can test their charging range without being outside the ISO rules. So, the AESO came up with this two-block mechanism. Optional bidding would occur after it commissioned and not while commissioning. The AESO further explained that it would simply look at the energy storage resource being commissioned as an offer only and then just either offer at \$0, so the facility can be discharging, if it is offered at \$999, it could be charging.

## **ISO Rule Development [Slides 63 to 67]**

The AESO presented its ISO rule development requirements, process, and next steps.

The AESO explained that, with the posting of the February 17, 2021 *Letter of Notice for Development of Proposed Amendments to ISO rules to Enable Energy Storage* ("Letter of Notice"), it has kicked off the ISO rule development process and that, prior to making any decisions on the development of energy storage ISO rule amendments, it is looking to receive feedback from stakeholders.

Stakeholders asked some final questions. The questions and the AESO's response is summarized below.

### **ISO Rule Approval Process and AESO Compliance Program**

The Government of Alberta Municipal Affairs asked a question related to the ISO rules approval process and about the ISO rules compliance program.

The AESO explained that once the proposed ISO rules have been written and approved by the Alberta Utilities Commission, then the AESO would action them within the Alberta energy market.

The AESO further explained that it would be clear regarding how it was going to perform compliance on a dispatch instructions. The AESO noted that there is a dispatch compliance program for its existing market ISO rules, these would just be layered in with those. The AESO monitors compliance to dispatch instructions, and then if it finds a non-compliance event, the AESO refers those events to the Market Surveillance Administrator ("MSA") for further action. The AESO further clarified that its mandate does not cover penalties, noting that penalties falls under the MSA mandate and that there is a process in place for where the AESO monitor the compliance to the ISO rules, and then refer those non-compliance events to the MSA.

### **AESO Recommendation Assumption**

CanREA stated that there was an assumption in the AESO's *Long-term Energy Storage Market Participation Draft Recommendation Paper* that the AESO's market design recommendations would not result in conflicting behaviour caused by competing price signals. CanREA added that the assumption does not seem to be consistent with what the AESO said at the session. CanREA further explained that it was going to need some clarity on that at some point.

The AESO said that they would take that back and provide clarity.

### **Energy Storage Asset Type**

CanREA also asked, if it is fair to say that the AESO is fully adopted the view that storage is not a load.

The AESO responded that the focus of the AESO's recommendations presented today are around market participation and that it tries to keep the ISO market rules as technology agnostic as possible. For the purposes of market participation, it classified energy storage as a source asset and a sink asset. The source being the discharge portion and the sink being the charge portion. The AESO added that there is no need to classify energy storage as anything other than a source asset and a sink asset for market participation. The AESO's recommendations are framed around leveraging what it has within the current offer structure.

The AESO added that this differs from technical ISO rules where there are different requirements for different technologies.

## **Next Steps**

The AESO presented its next steps, which include receiving stakeholder feedback on the Letter of Notice and the AESO's long-term energy storage market participation draft recommendations paper. The AESO noted that it has posted a comment matrix to request additional information and to seek feedback on specific questions.

The AESO stated that it would circulate draft meeting minutes to attendees for comment prior to finalizing them.

The AESO ended the session by thanking attendees for their participation at the session.