# Stakeholder Session Minutes

## Minutes from Session 3

**Location:** Hybrid session (in-person and virtual)

- **Virtual:** Microsoft Teams Meeting hosted by AESO
- **In-person:** 240Fourth Conference Centre, Rooms A-B, Main Floor, 240–4th Ave SW, Calgary, AB

**Date:** Thursday, February 2, 2023

**Time:** 9:00 am to 12:15 p.m.

**Attendees:**

| Organizations (in-person) | Organizations (virtual) |
|---|---|
| AESO | ABO Wind Canada |
| Arcadis-IBI Group (“Arcadis”) | Acestes Power |
| AltaLink | Aecon Concessions |
| ASCENT Energy Partners Ltd. (“ASCENT”) | AESO |
| Capital Power | Alberta Innovates |
| Teric Power | AltaLink |
| EDF Renewables | ASCENT Energy Partners Ltd. |
| Energy Storage Canada | ATCO |
| ENMAX Corporation | ATCO Electric |
| Federation Engineering | BBA Consultants |
| Heartland Generation Ltd. | BluEarth Renewable |
| Kestrel Power | BowMont Capital |
| Neoen Renewables Canada Inc. (“Neoen Renewables”) | Canadian Solar |
| NU-E Corp | Capital Power |
| PACE Canada LP (“PACE”) | CanREA |
| Suncor Energy Marketing Inc. | Capital Power |
| University of Calgary | Carlotta Energy |
| | Certrec |
| | Chapman Ventures Inc. |
| | City of Medicine Hat |
| | Competition Bureau |
| | Customized Energy Solutions |
| | DePal Consulting Limited |
| | EDF Renewables |
| | Enbridge Inc. |
| | Enel North America |
| | ENMAX Corporation |
| | ENMAX Power Corporation |
| | EPCOR Distribution & Transmission Inc. (“EDTI”) |
| | Evolugen |
| | Executive Fellow School of Public Policy University of Calgary |
| | Firefly Power and Energy |
| | Government |
| | GridBeyond |
| | Hep energy Canada Ltd. |



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| Organizations (in-person) | Organizations (virtual) |
|---|---|
| | KPMG Canada<br>Mirastar Energy<br>Neoen<br>NRG Curtailment Solutions<br>Nu E Corp<br>Perimeter Solar Inc.<br>Pembina Pipeline Corp<br>PGSC<br>Plains Midstream Canada<br>Potentia Renewables<br>Prairie Sky Strategy<br>Recurrent Energy<br>SWITCH Power<br>TC Energy Corporation<br>The Brattle Group<br>TransAlta Corporation<br>University of Calgary<br>Westbridge Energy<br>William Chow<br>Yes Energy LLC |

**Agenda:**

| Topic | Sub-topics |
|---|---|
| **Welcome / Introduction / Housekeeping** | • N/A |
| **Restructuring of Division 502 to Division 503** | • Why the restructuring?<br>• Scope of changes |
| **Section 503.1, *Functional Specification & Legacy Treatment* ("Legacy Rule")** | • Intent & principles<br>• Effective date markers for legacy treatment<br>• Questions/Group Discussion |
| **Break** | |
| **Specific Technical Questions** | • Operating reserves<br>• MARP/MACP<br>• Voltage, frequency, and power system stabilizer<br>• Operation, maintenance and auxiliary systems<br>• Other specific questions |

| Topic | Sub-topics |
|---|---|
| | • Questions/Group Discussion |
| **Open Q&A** | • N/A |
| **Next Steps** | • N/A |

## 1. Consultation Session Overview, Introductions, and Housekeeping [slides 2 to 16]

1) N/A – No questions or comments received

## 2. Restructuring of Division 502 to Division 503 [slides 17 to 24]

2) N/A – No questions or comments received

## 3. Section 503.1, *Functional Specification and Legacy Treatment* ("Legacy Rule") [slides 25 to 33]

3) Discussion regarding subsection 4 of the Legacy Rule and "like-for-like" maintenance-related activities.

   a. TransAlta requested the AESO to clarify legacy treatment for like-for-like replacements as part of maintenance-related activities.

   b. The AESO noted that the Legacy Rule mirrored the language of legacy provisions within existing Division 502 ISO rules, which do not expressly address like-for-like replacements of facilities. The AESO expressed its willingness to provide additional interim guidance regarding like-for like replacements in an information document, to the extent that doing so would be helpful to market participants. The AESO explained how it was trying to be mindful of scope creep and keep ISO rule amendments to those required for energy storage and was leaning toward initiating a separate consultation.

   c. TransAlta expressed concern about unfairness to market participants stemming from a piecemeal approach.

   d. The AESO acknowledged TransAlta's concern. The AESO asked attendees at the session whether they have experienced issues or inefficiencies with the current legacy provisions and like-for-like replacements.

   e. TransAlta confirmed that they had experience and that the process of seeking and awaiting exceptions adds extra time and concern about the potential outcome, including the potential for unexpected increases in scope of the replacements or upgrades.

   f. AltaLink provided a transmission facility owner's ("TFO") perspective, noting that TFOs' facilities are long-lived. AltaLink commented that the existing wording with respect to like-for-like replacements and maintenance-related activities is problematic, explaining that TFOs may not want to maintain a transmission facility to historical standards (*e.g.*, in the case of transmission facilities that were originally built and designed to 1950s standards). AltaLink commented that, in terms of specifying legacy treatment for maintenance activities, a concern would be the mechanism for delineating and discerning between systems and constituent components. AltaLink raised a hypothetical example of maintenance activities for a protection system that

extends to surrounding substations and which involves changes to settings and potentially other components (*e.g.*, circuit breakers, relays, and instruments). AltaLink commented that it would like additional clarity for purposes of complying with the applicable standards and requirements.

g. The AESO acknowledged AltaLink's comment. The AESO committed to exploring further changes to subsection 4 of the Legacy Rule, based on the feedback received. The AESO clarified that its intent is to maintain the current operation/practice of legacy treatment, whereby you only need to "bring up to code what you touch". The AESO is not seeking to mandate legal owners to upgrade whole facilities where only a single component requires replacement and does not anticipate a risk of wholesale facility upgrades being required as a result of upgrades.

h. The AESO asked attendees whether they could identify a broad set of circumstances where an exemption to complying with updated technical requirements should apply. The AESO recognized that Stakeholders may need time to consider the AESO's request and encouraged Stakeholders to contact the AESO with their suggestions.

i. EDTI inquired whether legacy treatment could be based on the nature of maintenance activities (*e.g.*, keeping a facility operational versus planned lifecycle replacement).

j. The AESO thanked Stakeholders for their feedback and explained that the AESO would consider the feedback in drafting the next version of the proposed Energy Storage ISO Rule Amendments.

4) Discussion regarding subsection 3 of the Legacy Rule and "effective time markers"

a. The AESO explained the concept of effective time markers in relation to legacy treatment for compliance purposes. The AESO reiterated its intention to not disrupt the *status quo* in terms of how legacy treatment currently works and sought attendees' input on what an effective time marker would be to delineate the "point of no return" for projects (*e.g.*, the point at which a project would not be expected to be re-designed to comply with updated technical requirements).]

b. AltaLink noted that AESO functional specification documents ("functional specifications") are not issued for maintenance activities. AltaLink expressed their preference to use the functional specification for purposes of an effective time marker, given that maintenance-related activities would fall outside the scope of the legacy treatment requirements. AltaLink explained that complications can still arise when a functional specification is issued a few weeks prior to a facility being energized, given that the facility would have already been constructed and that changes could potentially be impracticable. To mitigate against such complications, AltaLink proposed an approach based on the date when the functional specification for a given project is first finalized. AltaLink noted that a TFO's service proposal for a project, containing project-related cost estimates, is based on this version of the functional specification.

c. The AESO asked attendees if AltaLink's proposed approach would work for the generator/energy storage community.

d. Capital Power expressed support for AltaLink's proposed approach. Ideally, Capital Power expressed that the facility could be updated, but be held to the standard of the rules at the time when the functional specification was issued.

e. PACE inquired how AltaLink's proposed approach would differ from the "update letter" for a generation project, which is submitted to the Commission no more than 90 days prior to construction. PACE commented that, from a generator's perspective, the relevant version of the functional specification is the one included with the Commission update letter. PACE commented

that the relevant marker for generators would therefore be based on successfully completing the Commission update letter, as this would mark the "point of no return" in a generator project's lifecycle. PACE questioned the need for a different approach for energy storage, noting that an established, working process already exists.

f. The AESO agreed that the goal is to align the wording of the legacy treatment provisions with Commission processes and the AESO's connection process.

g. AltaLink commented that, with respect to transmission facility projects, they believe the marker is earlier than described by PACE, noting that the "point of no return" would be when the AESO issues the final functional specification for the project.

h. Neoen Renewables commented that, from a generator's perspective, their design and investment decisions are determined by the AESO's first final specification for a project.

i. Suncor sought clarification about the current state of legacy treatment in Alberta, including the blanket expectation for existing market participations to upgrade their facilities to comply with changes to ISO rules.

j. The AESO clarified that the expectation remains for all market participants to comply with relevant ISO rules on a go-forward, but acknowledged that imposing uniform performance standards on older generating units may be inefficient in some cases. The AESO explained that the development of new or amended technical ISO rules includes an assessment of whether legacy treatment is required and appropriate under the circumstances. The AESO noted that existing legacy treatment provisions in Division 502 are drafted to stipulate blanket *compliance* with new or amended ISO rules, subject to specific exceptions/carves outs. The proposed mechanism in subsection 3 of the Legacy Rule is to stipulate blanket *legacy treatment* for existing facilities, subject to specific exceptions within the Division 503 rules (*i.e.*, where existing facilities are required to upgrade for compliance with a Division 503 rule, the rule will expressly indicate so).

k. ASCENT expressed their view that the ideal effective time marker is at the final investment decision. ASCENT commented that functional specifications address matters (*e.g.*, remedial action schemes) that go beyond relevant technical requirements for compliance purposes, and that the AESO's current practice enables the AESO to make changes to a functional specification after final investment decision, which can have financial impacts for market participants. ASCENT commented that, while it may not be possible to achieve total certainty forever, it would be less discouraging to investment if a lock-in date could be introduced to limit the type of changes to functional specifications. ASCENT confirmed that their concern is less about the ISO rule requirements and more about the AESO's ability to change the technical requirements in the functional specification.

l. TransAlta responded to Suncor's remarks regarding legacy treatment, citing differences between the legacy treatment practices for environmental permits and ISO rule requirements.

m. The AESO explained that it is seeking to follow best practices for legacy treatment, such as those employed in permitting and licensing matters. The AESO further noted that its objective is to not apply legacy treatment in a vacuum and that application may depend on the contextual nature of individual projects.

n. AltaLink commented that the example used in their feedback on Version 2.0 of the Energy Storage ISO Rule Amendments focused on bulk transmission line-related matters in existing

Section 502.2 of the ISO rules; however, their comments extend to all other ISO rules that apply to TFOs.

o. The AESO reiterated its earlier point regarding the need to carefully consider scoping while making necessary adjustments to the ISO rules to integrate energy storage.

p. The AESO committed to exploring new language for subsection 4 of the Legacy Rule based on the discussion.

## 4. Technical Rules for Energy Storage [slides 34 to 54]

5) Discussion regarding Sections 205.4, 205.5, 205.6 and operating reserves

a. EDTI asked whether the graph on slide 37 takes into account synthetic inertia.

b. The AESO confirmed that the requirement for frequency ride through would be applicable to energy storage as well.

6) Discussion regarding proposed Section 503.2, MARP [maximum authorized real power], and MACP [maximum authorized charging power]

a. TransAlta inquired whether MACP necessarily implies that an energy storage resource is charging from the interconnected electric system and sought clarification regarding ties to Rate DTS.

b. The AESO explained that Rate DTS and Rate STS are functions of the ISO tariff, whereas MACP is an attribute of the energy storage resource itself. The AESO clarified that MACP doesn't necessarily imply charging from the interconnected electric system and that MACP would still apply to an energy storage resource that is able to charge through other means.

c. TransAlta sought confirmation of its understanding that: (i) MACP doesn't translate to Rate DTS contract capacity, even if the energy storage resource does not intend to charge beyond the relevant Rate DTS contract capacity; and (ii) MACP simply relates to the maximum level to which an energy storage resource can charge.

d. The AESO confirmed TransAlta's understanding.

e. Arcadis sought clarification regarding the "auxiliary loads" that are excluded when determining MARP and MACP.

f. The AESO clarified that the auxiliary loads to be excluded are located on the AC side of the inverter, generally referred to as the "collector bus".

7) Discussion regarding proposed Section 503.6 and frequency and speed governing requirements for "synchronous machines"

a. Capital Power inquired whether "synchronous machine" will be defined, and whether its application or non-application to a battery energy storage system, which may provide synthetic inertia, is clear.

b. The AESO clarified that battery energy storage resources generally are inverter-based, and that "synchronous" refers to the machines, rather than (i) the ability for a resource to provide synthetic inertia; or (ii) the use of virtual synchronous capability. The AESO noted that it can revisit the

definition matter if there is ambiguity or can issue guidance to market participants as long as the requirement itself is captured in an ISO rule.

8) Discussion regarding proposed Section 503.6, and frequency-response requirements for energy storage resources

   a. TransAlta objected to the proposed requirement for an energy storage resource to be frequency responsive when consuming active power. TransAlta likened the proposed requirement to conscription of a service that resembles operating reserves. TransAlta asserted that the proposed requirement creates fairness issues, given that similar requirements do not exist for loads.

   b. In response to the AESO's clarifying questions, TransAlta expressed concerns about cost impacts for market participants who provide frequency response without compensation, particularly if the market participant had not intended to provide frequency response. TransAlta commented on a perceived asymmetry between energy storage resources and generating units, given that generating units are not required to provide frequency response when they are not generating power.

   c. PACE commented that wind aggregated generating facilities can provide frequency response services even when not actively generating power but asserted that there is a cost associated with providing such services. PACE agreed with TransAlta that the AESO is asking for a service without being compensated.

   d. The AESO noted that the probability of under-frequency events are greater than over-frequency events. The AESO asked attendees about the possibility of achieving a compromise; for example, creating an exemption for energy storage resources to be frequency responsive to over frequency conditions while operating in charging mode while maintaining the requirement to be frequency responsive to under-frequency conditions in charging mode.

   e. TransAlta, noted that the opposition to the proposed requirement is based on general principle. ENMAX and Suncor agreed with TransAlta. The parties encouraged the AESO to develop a markets-based solution, expressing a strong preference for a markets-based solution over conscription whenever possible, which will enable voluntary participation in the provision of services.

   f. The AESO acknowledged the concerns voiced by market participants. The AESO explained that currently, from an overall framework perspective, the AESO obtains attributes like frequency response through the energy-only market from assets that can provide such attributes. Those assets are expected to price their attributes into the energy-only market accordingly. The AESO expressed concerns about removing attributes from the energy-only market by removing the technical requirements around frequency response. The AESO mentioned the AESO's upcoming Reliability Roadmap initiative and explained how work is underway to explore rules-based and market-based options for framework solutions.

   g. Kestrel Power, citing the droop calculations for energy storage resources, raised concerns about differential treatment of energy storage resources and generating units from a technical perspective while noting that in some ways they are doing the same thing.

   h. The AESO clarified that the droop calculation is based on requirements in the existing ISO rules for battery energy storage facilities. The AESO noted that it was not originally proposing any changes to those existing requirements but is open to reviewing them again.

i. ASCENT noted that technical requirements cannot be separated from their market implications and commented that historical approaches and practices should not preclude realizing the various value streams that technological innovation (*e.g.*, energy storage resources) can provide.

j. The AESO responded to parties' comments and concerns, explaining that the AESO has a heightened awareness of the intersectionality of the Energy Storage ISO rules Amendments with other authoritative documents (*e.g.*, the ISO tariff, Alberta reliability standards). The AESO explained that further work is required The AESO clarified that the proposed Energy Storage ISO Rule Amendments are one part of the overall process for integrating energy storage in Alberta, and further work to evaluate market evolution and the Alberta reliability standards will come.

k. The AESO revisited the question about whether requiring energy storage resources to be frequency responsive in charge mode only for under-frequency events was an acceptable compromise. The AESO also asked attendees if there are any other areas of concern in the ISO rules where technical design specifications create seams between markets and operations.

l. ASCENT acknowledged the complexity of preparing ISO rules for a market structure that has yet to be developed. ASCENT commented that their concern is not whether the technology is capable of frequency response in charging mode, but that market participants be compensated when providing services.

m. TransAlta expressed their view that compromise is insufficient and that the frequency response requirement for energy storage resources operating in charging mode is too onerous, citing the impacts on market participants who are already on the system.

n. Suncor stated that it understands the AESO's desire to keep matters separate but expressed reservations about the possibility of fully separating the ISO rules and ISO tariff. Suncor cited Rider J in the ISO tariff, which is used to rebalance the impacts stemming from the non-application of the must-offer, must-comply requirement to wind assets.

o. The AESO acknowledged the parties' comments and concerns and reiterated that the electricity industry is in a period of transformation, characterized by many changes. The AESO asked attendees whether they were able to identify other seams issues in the technical rules that the AESO may need to revisit for the next version of the proposed Energy Storage ISO Rule Amendments.

p. Capital Power expressed that, while they share the same concerns voiced by ASCENT, Suncor, PACE, and TransAlta, they acknowledge the challenge of trying to maintain a focused scope in order to advance the Energy Storage ISO Rule Amendments initiative. Capital Power expressed interest in the AESO making firm commitments on timelines and with respect to the markets- and ISO tariff-related consultations. Capital Power stated that they are open to the AESO making such commitments in the AESO's upcoming written responses, which would ease their concerns about the changes being made in advance of the other interrelated initiatives.

q. The AESO advised that, in the near-term, it will provide more insight regarding the other interrelated initiatives and explained that certain aspects may require dedicated Stakeholder engagements. The AESO explained that certain developments associated with the Reliability Roadmap may have material impacts on the market, which could impact the energy-only market structure and investor confidence. The AESO acknowledged and expressed support for value stacking, given that it leads to more competitive outcomes, but reiterated that removing frequency response attributes from the energy-only market would have market impacts. The AESO

emphasized that making changes of this nature requires holistic assessment of the potential impacts.

r. IPCAA expressed support for the AESO's comments and acknowledged that the AESO is working towards a longer-term objective. IPCAA stated that making short-term concessions for energy storage could potentially lead to adverse long-term price signals for investors seeking to make multi-year investments and emphasized the need to maintain clear price signals both in the near-term and long-term.

s. The AESO sought confirmation of its understanding that attendees were unopposed to energy storage resources being frequency responsive in charging mode if those resources were participating in an operating reserve market for frequency response. The AESO noted that loads have frequency responsive attributes through damping and asked whether this should be considered when evaluating energy storage resources acting like loads.

t. TransAlta inquired whether the AESO already obtains frequency response attributes from energy storage resources in charging mode, given that other loads provide damping and that damping is a passive attribute.

u. The AESO explained that, given the relative novelty of energy storage and limited number of energy storage resources on the interconnected electric system, the AESO is currently unclear about whether it already obtains frequency response attributes from energy storage resources in charging mode.

v. ASCENT provided more context around considering energy storage resources as loads. ACENT noted that if the AESO is going to compensate storage facilities for synthetic inertia, there will need to be compensation to synchronous generators for inertia that today is put on the interconnected electric system for free. ASCENT further explained that if the expectation is for battery energy storage device to mimic load when charging, there is no problem.

w. ENMAX noted that the industry is transitioning into a new and different era. ENMAX observed that, historically, generating units generally had inertia and provided frequency response as a basic requirement for connecting to the interconnected electric system. ENMAX stated that, today, many of the resources connecting to the interconnected electric system do not have inertia, resulting in potential fairness issues if only some resources are expected to provide frequency response. ENMAX stated that favouring inverter-based resources (*e.g.,* wind and solar) will deter the connection of other types of generating units with inertia. ENMAX stated that reliability issues could result unless, where there are differential capabilities between resources, those resources are compensated for providing specific attributes.

x. The AESO thanked attendees for their participation and agreed to review the technical requirements for energy storage frequency response in consideration of the discussion.

## 5. Next Steps and Closing Remarks [slides 54 to 57]

9) N/A – No questions or comments received