

Energy Storage Update

March 12, 2020

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Time	Agenda Item	Presenter
9:00 – 9:10	Welcome, introduction and purpose	AESO
9:10 – 9:40	ES Roadmap integration activities progress: <ul style="list-style-type: none">• Active Connection Projects update• Phase 1: Short-term implementation update• Phase 2: Long-term implementation update• 2020 Plan• Energy Storage Industry Learnings Forum (ESILF)	AESO
9:40 – 10:05	Q&A and next steps	AESO and All
10:05 – 10:35	Interrelated initiatives update: <ul style="list-style-type: none">• AUC Distribution System Inquiry• ISO Tariff Design• Distributed Energy Resources (DER)• Coordinated planning framework	AESO
10:35 – 11:00	Q&A and next steps	AESO and All

OUR ENGAGEMENT PRINCIPLES

Inclusive and Accessible

Strategic and Coordinated

Transparent and Timely

Customized and Meaningful

- Introduction
 - Presenter and team for Q&A
 - How to submit questions
 - All questions not addressed in session will be posted with answers by the end of March
- Purpose
 - Energy Storage Roadmap overview
 - Quarterly update sessions to ensure visibility to stakeholders

Energy Storage Roadmap Update

- Active Connection Projects
- Short-term activities
- Long-term activities
- 2020 Plan
- Energy Storage Industry Learnings Forum (ESILF)

- What is this?
 - These are the projects in the AESO Connection Process with Energy Storage Resources (ESRs)
 - There are 16 projects currently on the connection list
 - Five of these projects currently have in-service dates (ISDs) in 2020
- AESO approach:
 - Connections being facilitated under the current legislative framework and AESO Authoritative Documents (ADs)
 - Information Documents (IDs) to provide clarity for connection will be published in Q2
 - A stakeholder session on the market rules IDs will be scheduled in April 2020, stay tuned for the invitation

- System Access Service Request (SASR) form being updated to include energy storage – new form will be implemented by June 2020
- Technical studies – various, internal, technical studies are in progress to understand energy storage performance capabilities and potential grid reliability impacts related to:
 - ESR size (volume)
 - Duration
 - Converting some current products to be technology neutral

- Technical studies will feed into these activities
- Tariff – all ESR related activities will be part of the 2020 Bulk and Regional Tariff Design work
 - There will be an update on this later in the session
- AESO groups working on:
 - Forecasting, planning and market reports
 - Configurations, market qualification and connection
 - Market participation
 - Operations
 - Storage as a transmission alternative

- In the Energy Storage Roadmap we have a full initiative plan out to the end of 2022
- This 2020 plan is an annual plan to provide a more detailed view to this years activities for stakeholders
- In addition we are using this to indicate the engagement opportunities and timing to allow stakeholders visibility and time to plan for participation, where appropriate:
 - ES update sessions planned to be quarterly with stakeholders
 - ESILF workshops for the membership of that forum
 - Long-term work areas may have ad-hoc opportunities for topic specific engagement

- This forum is designed to enable AESO to learn more about ESRs from experienced industry members
- Industry experienced membership based participation
- Interactive style workshops to explore specific topic areas and allow AESO team learning for deeper understanding of technical and operational parameters around ESRs
- Learnings from the workshops will be posted on the ES website for all stakeholder visibility

- Market rules IDs stakeholder session planned for April
- ESILF kick-off workshop planned for April
- Webinar recording will be posted by the end of the week
- All questions not addressed in session will be posted with answers by the end of March
- Summary and feedback on 2020 Plan posted early April
- Next update session planned for Q2 2020

Q&A

Interrelated Initiatives Update

- AUC Distribution System Inquiry
- Distributed energy resources (DER) Roadmap
- Distribution/Transmission (Dx/Tx) Coordinated Planning Framework
- ISO Tariff Design

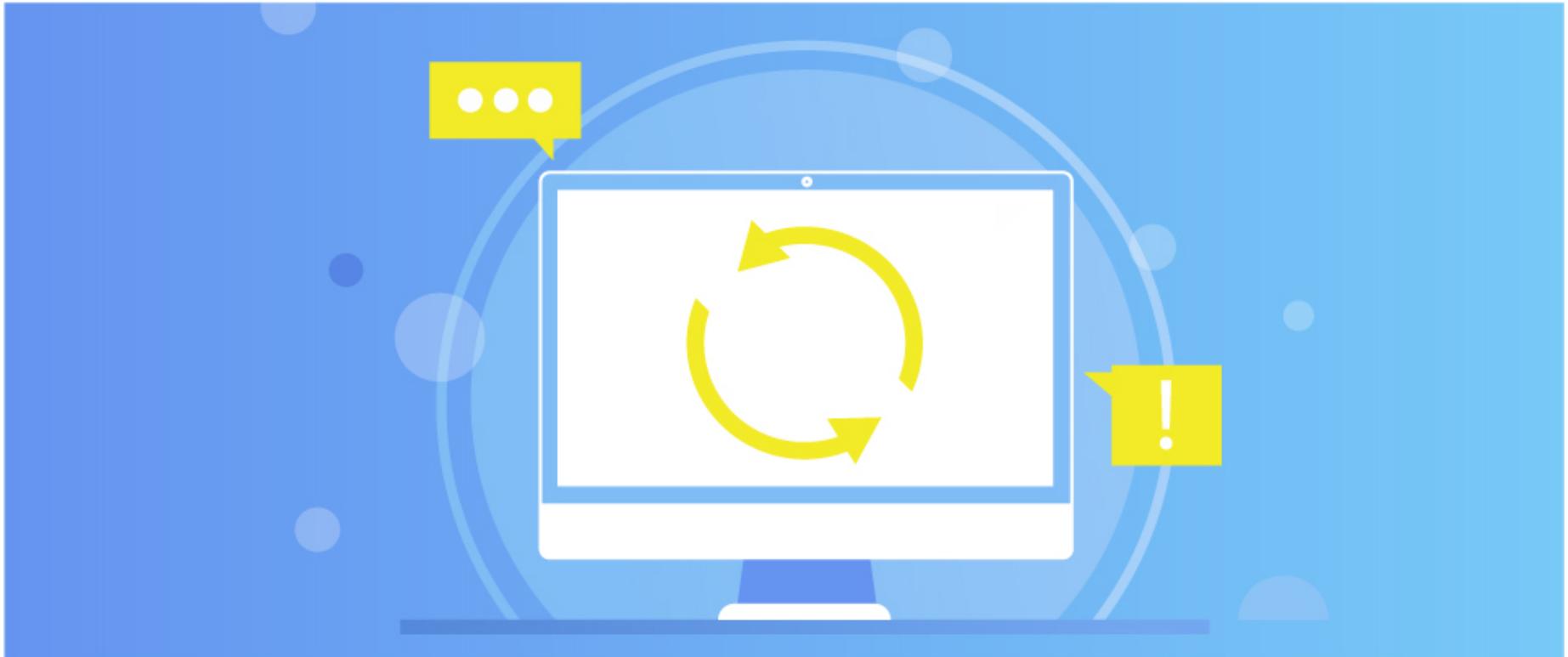
- DSI is a collaborative approach to identifying key issues related to the distribution system's future
- Module One
 - Submissions July 17, 2019
 - IR responses Aug. 28, 2019
 - AESO participated technical conference Sept. 10-12, 2019
 - Supplemental submission Nov. 15, 2019
- Combined Modules Two & Three
 - AESO response to AUC IRs submitted Nov. 29, 2019
 - Energy storage scenarios were specifically addressed within Information Request (IR) #13
 - Submission due March 13, 2020

- Directional plan to proactively prepare the AESO for a future state of higher penetration of DERs on the Alberta Interconnected Electric System (AIES)
- Explores challenges and opportunities impacting reliability, markets and tariffs
 - AESO internal processes impacted by DER integration
 - Need for additional DER data and streamlined DER data collection processes
 - Impacts of DERs on forecasting and modelling, system planning, real-time operations, and transmission-distribution interconnection requirements
 - Evaluate the possibility of lower minimum-size thresholds and expanded aggregation in the energy and ancillary services market
- DER Roadmap to be published by end March 2020

- The AESO intends to kick-off an initiative to develop, in alignment with industry, a framework to support the coordination of Transmission and Distribution planning
- The AESO's focus in this initiative will be on the transmission and distribution interface and the implications to the grid
 - Distribution planning and reliability criteria
 - Distribution load forecasting and coordination with AESO
 - Economic evaluation approaches (cost/benefit)
 - Role of probabilistic analysis
 - Coordination of longer term distribution plans with AESO
 - Stakeholder alignment regarding the issues to be addressed
- Ultimately, a coordinated transmission and distribution planning framework, to be completed by the end of 2020

- 2020 Bulk and Regional Tariff Design Application work is in progress
 - Within this scope, energy storage is being considered
- Treatment of energy storage in the ISO Tariff will be processed within the Bulk and Regional Tariff Design work
- Tariff rate design objectives and rate options will be reviewed with stakeholders at a session on March 13, 2020

Q&A



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Thank you