2022 Budget Review Process Proposed Business Initiatives & Preliminary Forecasts and Budgets Session 2

September 29, 2021

Notice

In accordance with its mandate to operate in the public interest, the AESO will be audio recording this session and making the session recording available to the general public at www.aeso.ca. The accessibility of these discussions is important to ensure the openness and transparency of this AESO process, and to facilitate the participation of stakeholders. Participation in this session is completely voluntary and subject to the terms of this notice.

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Welcome and Introductions

Welcome and introductions

- Mike Law, President and CEO
- Nicole Kinch, VP, Finance
- Bill Baker, VP, Information Technology
- Miranda Keating Erickson, VP, Markets
- Dennis Frehlich, VP, Grid Reliability
- Pauline McLean, VP, Law, General Counsel and Corporate Secretary
- Karen Campbell, Director, Settlement, Credit and Business Planning
- Kevin Dawson, Director, Forecasting & Analytics
- Pam Tretiak, Director, Finance – Accounting & Treasury
- Soheila Karimi, Forecasting Analyst
- Karla Anderson, Senior Stakeholder Relations Advisor

Session purposes and objectives

- Purpose
  - The purpose of the session is to engage stakeholders in a discussion of 2022 Budget Review Process (BRP) Session 1 stakeholder feedback, plans for proposed 2022 business initiatives, and preliminary forecasts and budget
- Session objectives
  - Share our learnings on 2022 BRP Session 1 stakeholder feedback
  - Present, discuss and seek stakeholder input on AESO's consideration of stakeholder feedback and plans for proposed 2022 business initiatives
  - Present, discuss and seek stakeholder input on the AESO's 2022 preliminary forecast and budget information, including:
    - Transmission Operating Forecasts, and
    - AESO Own Costs Budget

Agenda

Time	Agenda Item	Presenter
9:00 – 9:10	Welcome, introductions, purpose and session objectives	Karen Campbell
9:10 – 9:15	2022 Budget Review Process • Process overview and engagement schedule	Karen Campbell
9:15 – 10:00	What we heard and how we plan to proceed • At-a-glance overview • 2021 and 2022 multi-year business initiatives • Q&A	Karen Campbell Miranda Keating Erickson Dennis Frehlich Nicole Kinch Pauline McLean
10:00 – 11:25	2022 Preliminary Forecasts and Budgets • Transmission Operating Costs • Wires Costs • Forecast Pool Price • Load Outlook • Ancillary Services Costs • Transmission Line Losses Costs • General and Administrative Budget • Capital Budget • Management Controls and Contingency • Q&A	Soheila Karimi Pam Tretiak Karen Campbell
11:25 – 11:30	Session close-out and next steps	Karen Campbell

AESO Stakeholder Engagement Framework

Stakeholder participation

The participation of everyone here is critical to the engagement process. To ensure everyone has the opportunity to participate, we ask you to:

- Listen to understand others' perspectives
- Disagree respectfully
- Balance airtime fairly
- Keep an open mind

Asking questions

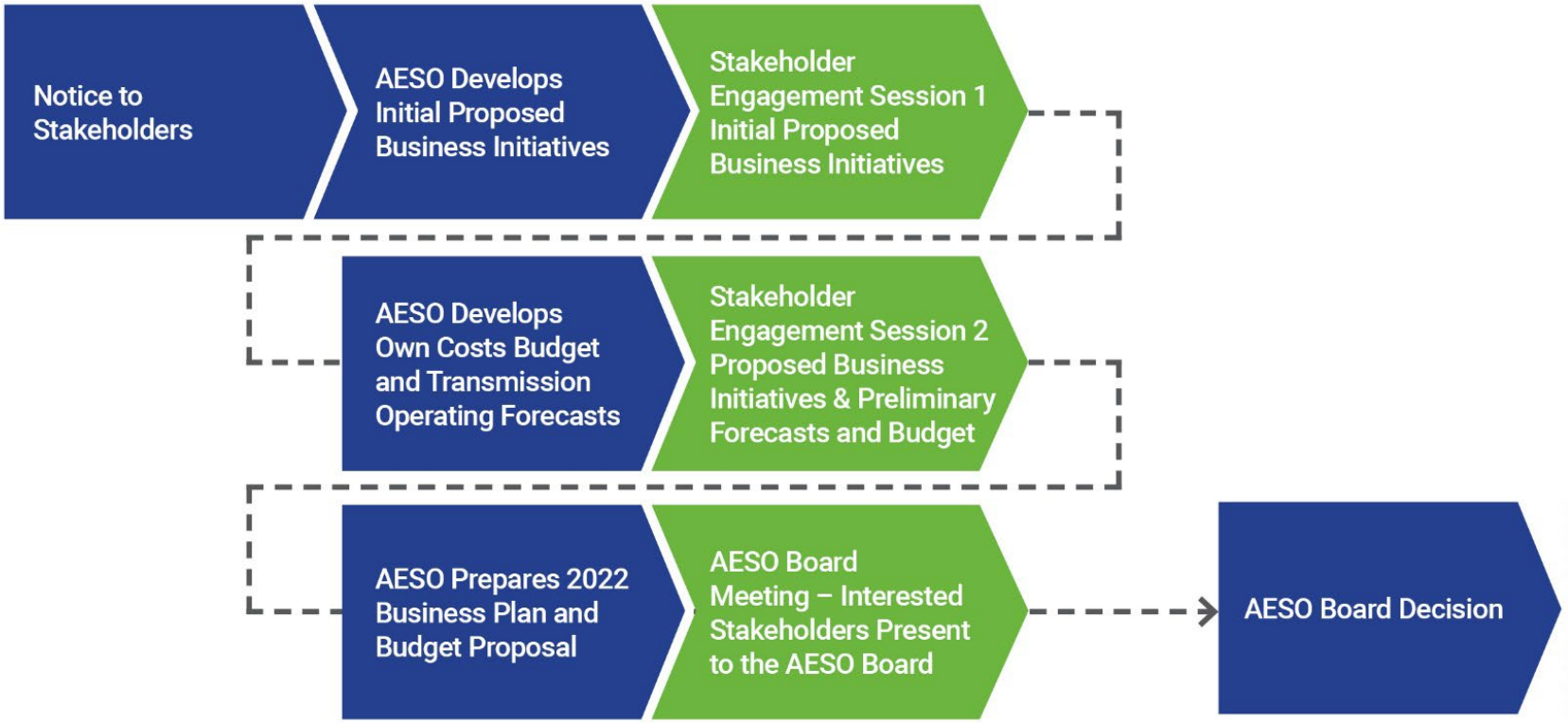
- Two ways to ask questions if you are accessing the webinar using your computer or smartphone
  - Click “Raise Hand” icon and the host will be notified that you would like to ask a question. The host will unmute your microphone, you in turn will need to unmute your microphone and then you can ask your question.
    - When asking a question, please state the “organization you work for and your first and last name”
  - You can also ask questions by using the chat function and typing them in. Please add “question and the organization you work for” at the start of your chat, for example: “Question ABC company: what does BRP stand for?”

Registrants (as of Sept. 22, 2021)

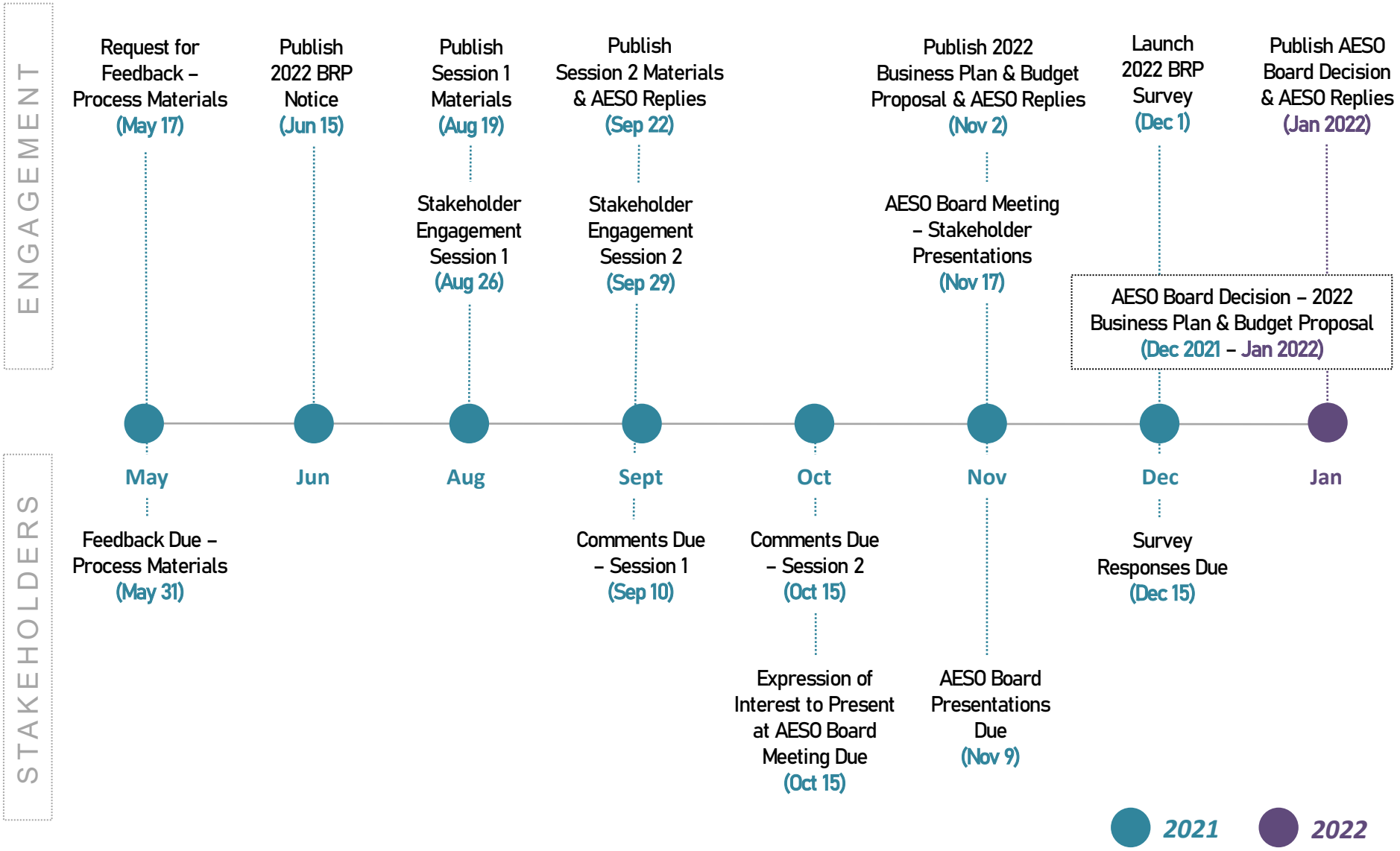
- Alberta Direct Connect Consumers Association (ADC)
- Alberta Newsprint
- AltaLink
- Best Consulting Solutions Inc.
- Capital Power
- Chymko Consulting Ltd.
- Customized Energy Solutions
- DePal Consulting Ltd.
- ENMAX
- EPCOR
- Greengate Power
- Heartland Generation
- Imperial Oil
- Independent Power Producers Society of Alberta (IPPSA)
- Industrial Power Consumers Association of Alberta (IPCAA)
- Lionstooth Energy Inc.
- Stantec Consulting
- Suncor Energy Inc.
- TransAlta Corporation
- Utilities Consumer Advocate (UCA)
- URICA Asset Optimization

2022 Budget Review Process

2022 BRP process overview

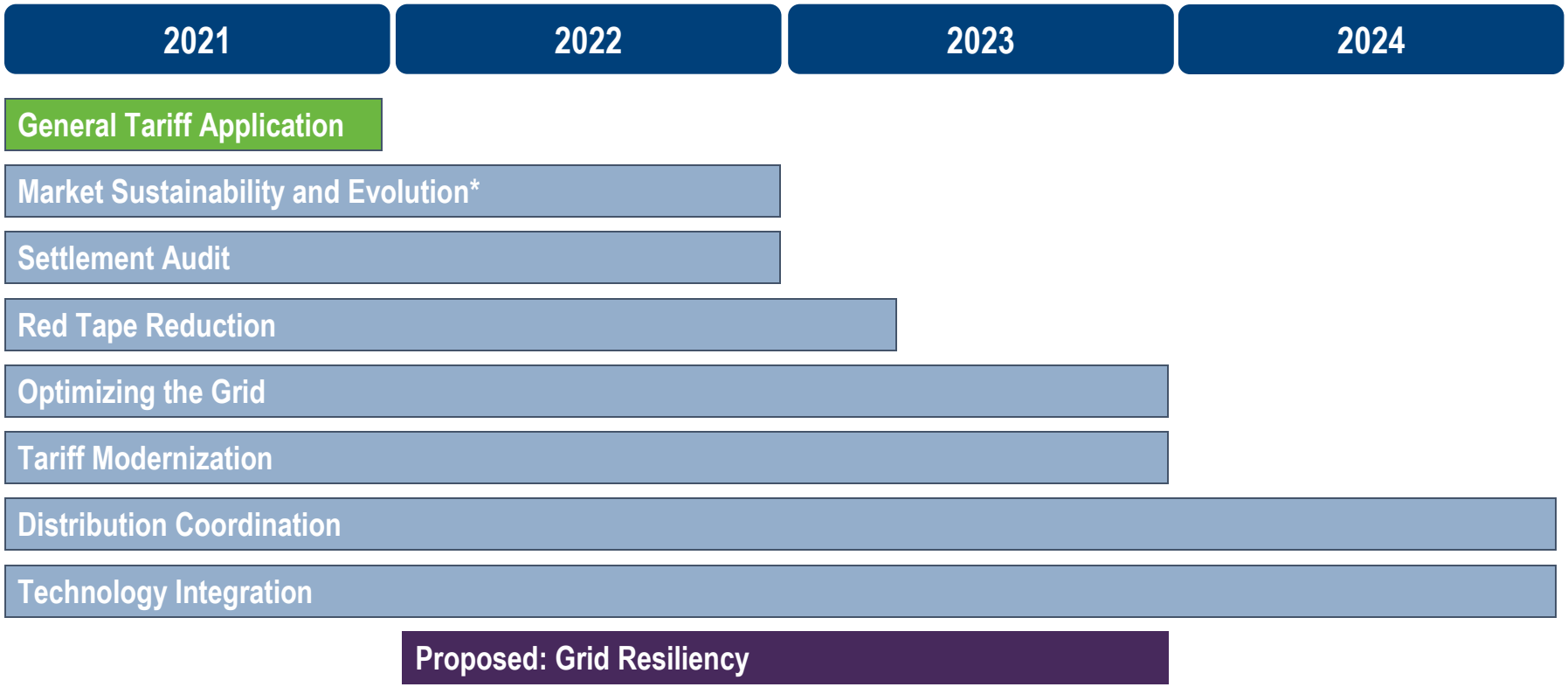


Stakeholder engagement schedule



What We Heard and How We Plan to Proceed

Overview of business initiatives



Legend:	Complete	Existing Multi-Year Initiative	Proposed Initiative
	*Merged Market Sustainability and Evolution I & II and Operating Reserve (OR) Market Competitiveness Enhancement Initiatives from 2021 BRP		

These are the questions we asked you to consider

- As we reviewed the status and next steps of the 2021 multi-year business initiatives and presented the initial proposed 2022 business initiatives, questions we asked you to consider:
  - What are your views on the proposed next steps and milestones for the 2021 multi-year business initiatives?
  - What are your views on the initial proposed 2022 business initiatives that the AESO has recommended to advance?
  - What are your views on the priority levels of these business initiatives?
  - Do you believe there may be business initiatives the AESO should be advancing which have not already been captured? If so, what would these be?

General Tariff Application (GTA)

Mandated – Top Priority Business Initiative – Complete 2021

Initial proposal
- In progress

Anticipated completion
- 2021
- GTA will continue to be part of ongoing base business

Objective
- Implement approved tariff provisions from 2018 GTA into connection process and AESO business

Interdependencies
- Tariff Modernization
- Technology Integration
- Distribution Coordination

What we heard

- Most stakeholders agree this as a top priority business initiative and strongly advocate the importance to complete related implementations
- Some stakeholders believe this initiative should continue into 2022 until the AMP implementation is complete, while others support the completion of the initiative in 2021 and moving it to become part of ongoing base business
- Stakeholders agree proposed next steps appear reasonable
- Acknowledgement that the AESO has a central role in reducing regulatory lag
- Request for additional quantitative analysis during engagements to be provided in order to better understand outcomes and prevent unintended consequences
- Seek better understanding of Distribution-Connected Generation (DCG) unlimited liability concerns with respect to customer impacts and System Project Cost Criteria

Adjusted Metering Practice (AMP)
- The impending AMP implementation plan details and associated timing creates investor uncertainty
- Implementation is a priority as sufficient time is required for stakeholders to prepare their organizations for any changes and cost impacts that may result

How we plan to proceed

- Continue to file tariff rate updates in advance to allow for timely implementation
- Continue to work with DFOs and TFOs to develop an AMP implementation plan that includes informed input on their implementation considerations to balance timeliness and cost
- To support regulatory efficiency, continue to simplify and streamline regulatory process for ISO tariff operations (e.g., reduced length of Deferral Account Reconciliation (DAR) application to support reduced approval timeline)
- Addressing the unlimited liability concerns for DCGs should have no significant impact on residential, farm and small business consumer's future utility bills. The participant-related cost of transmission expansions to serve DFO consumer's needs will continue to be recovered from consumers and any incremental participant-related transmission costs incurred to connect DCGs will be charged to the DCG at time of connection.
- The AESO intends to engage with DFOs and industry stakeholders on the AESO's criteria for the initiation of system transmission projects, as directed by the AUC in Decision 22942-D02-2019 (in AESO's 2018 ISO tariff)

Market Sustainability and Evolution

Business Initiative

Initial proposal
- In progress
- Merged Market Sustainability & Evolution I & II and OR Market Competitiveness Enhancement from 2021 BRP

Anticipated completion
- 2022 (dependent on findings)
- Implementation will follow, if determined to be required

Objective
- To maintain the long-term sustainability and competitiveness of the energy-only market structure and to enable the integration of new technologies with a long-term view of potential market changes needed to facilitate continued resource adequacy and increased flexibility with an ever increasing variable system

Interdependencies
- Technology Integration

What we heard

- Most stakeholders agree this as a low to medium priority business initiative
- Long-term market sustainability is critical, and many stakeholders view that constantly reviewing the market structure may impede investor certainty; concerns over another review of price caps and price floors within 24-month timeframe
- Market evolution must be tied to reliability
- Some stakeholders support an operating reserves (OR) competitiveness review, mothball rule review and assessment of potentially new ancillary services (AS) products while others consider reviews and changes unnecessary
- Mothball rule changes should not compromise market transparency and stability
- Encouragement for the AESO to continue to solicit stakeholder feedback early in the assessment process before proceeding to make changes. Suggested practice of identifying issues, providing cost benefit analysis, soliciting feedback, and making a recommendation prior to making rules changes
- Request for the AESO to work with flexible loads to develop products that value their characteristics

How we plan to proceed

- Complete stakeholder engagement on the proposed changes to ISO rule Section 306.7 Mothball Outage Reporting; progress proposed changes to ISO rule Section 306.7 Mothball Outage Reporting to AUC
- Initiate stakeholder engagement on any identified OR market design changes and corresponding ISO rule changes to enhance competition; progress to implementation as appropriate
- Release update to System Flexibility Assessment Report, based on 2021 LTO and scenarios
- Following updated analysis based on 2021 LTO and scenarios (long-term adequacy, revenue sufficiency, system flexibility assessment, etc.), identify any other required market initiatives to support long-term sustainability and competitiveness of the energy-only market, with a long-term view of potential market changes within the existing structure needed to facilitate continued resource adequacy and increased flexibility

Settlement Audit

Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2022
- Settlement Audits will become part of ongoing base business

Objective
- Perform an audit of the AESO's financial settlement processes

Interdependencies
- No interdependencies

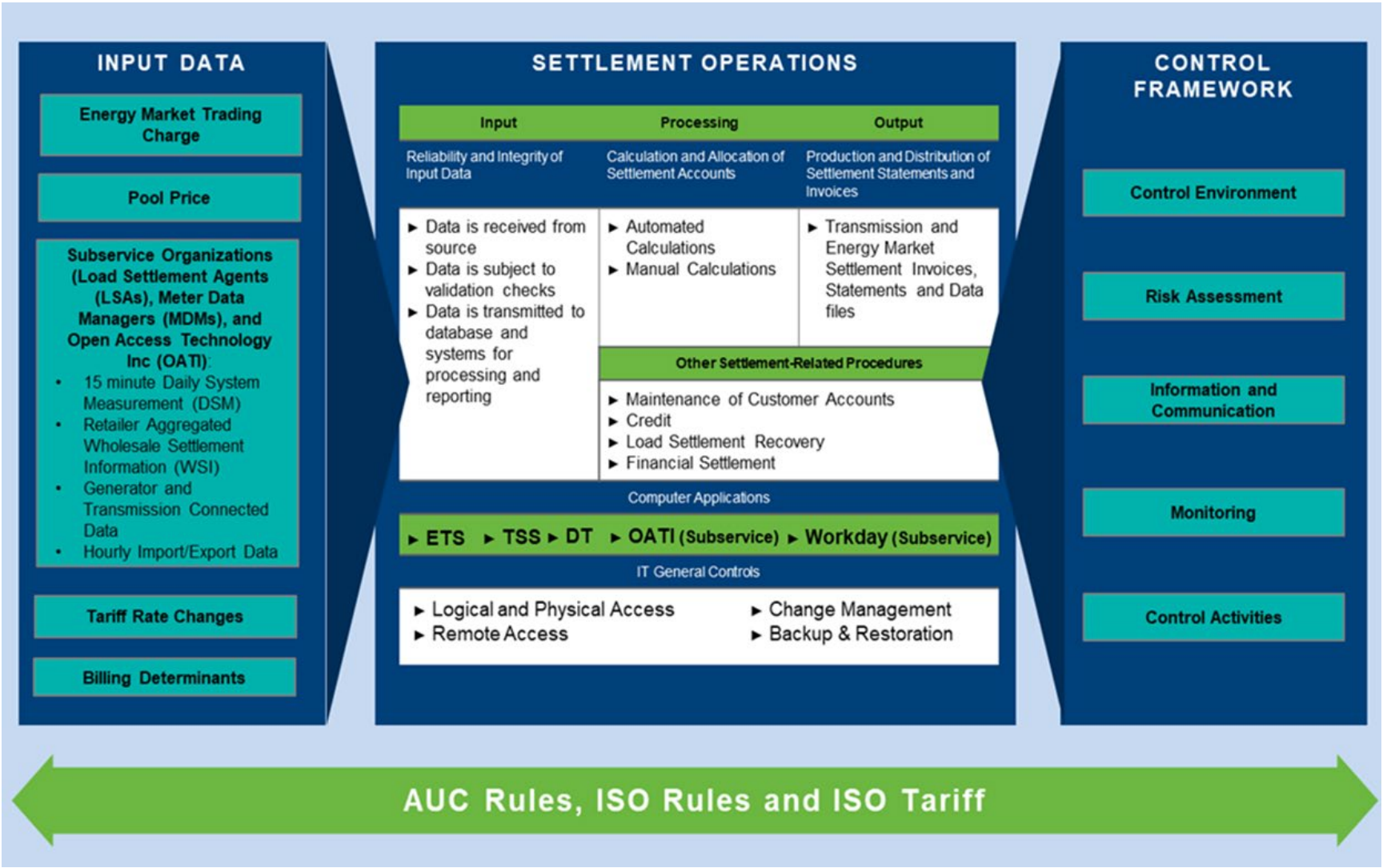
What we heard

- Stakeholders support for the AESO's intention to complete the audit in 2022
- Some stakeholders expressed support for settlement audits becoming part of ongoing base business
- Request to share settlement audit terms of reference (TOR) or scope; seek stakeholder input on TOR; seek opportunity for stakeholders to meet with third-party auditors to share settlement concerns ahead of audit; share progress updates on audit; share post-audit report and any recommended next steps/actions to be taken as a result of the audit

How we plan to proceed

- The AESO intends to complete the Settlement Audit in 2022
- The AESO intends for settlement audits become part of base business, performed regularly with the frequency to be determined
- In the replies to stakeholder comments from the August 26th BRP session, the AESO has provided some additional information and a diagram that is a conceptual overview of the AESO's settlement operations and the related control framework that will be considered in the Settlement Audit (see next slide for diagram)
- The AESO intends to share a post-audit report to stakeholders upon request and subject to non-disclosure agreement
- The AESO will provide updates in the quarterly stakeholder report published to the AESO website

AESO's Settlement Operations and Related Control Framework



Red Tape Reduction

Mandated – Top Priority Business Initiative

Initial proposal
- Mandated in 2020

Anticipated completion
- March 31, 2023
- Red tape will become part of ongoing base business

Objective
- To be in compliance with the GoA *Red Tape Reduction Initiative*, the AESO is committed to reducing regulatory requirements by one-third by March 31, 2023

Interdependencies
- Tariff Modernization
- Technology Integration

What we heard

- Majority of stakeholders believe this is a top priority and support the reduction of regulatory burden with the caveat that it does not inadvertently result in a shift of burden from agencies to market participants or create additional costs in the market
- Request to explore Alberta Reliability Standards (ARS) and the compliance process to focus on areas that contribute to reliability, safety and the economic operation of the Alberta grid using a risk-based approach
- Request when the AESO is making changes to reduce red tape to be open to making improvements in a coordinated fashion and to share the AESO's red tape reduction workplan to increase visibility to organizations to aid them in ensuring resources are allocated to provide meaningful input into the effort; measured and thoughtful pace to change with support by quantitative analysis, prior to enacting change, would significantly improve regulatory efficiency and reduce red tape
- Request to include a review of the loss factors methodology and process to offer simpler, earlier and effective signals to developers
- Request for detailed breakdown of the math and details associated with the estimated industry cost and time savings to better understand efficiency gains and cost savings for both the AESO and market participants

How we plan to proceed

- The AESO intends to drive to the 33% reduction in requirements as per the Government of Alberta's RTR program.
- The AESO is open to exploring other areas where market participants have concerns about regulatory burden, such as loss factors and ARS compliance monitoring.
- The AESO has absorbed RTR-related activities into existing workplans, initiatives and internal processes where possible.
- The changes made to date pursuant to the RTR initiative at the AESO are estimated to result in cost savings of $350,000, the majority of which will relate to avoided external process costs, capital costs and labour costs. The AESO's estimate of these savings was premised on historical transaction volumes and the per-transaction costs borne by each of the AESO and pool participants. With respect to avoided capital and labour costs, the RTR changes made this year are estimated to result in significant savings throughout 2022 as detailed in the AESO replies to stakeholder comments.
- With respect to the status of the ISO Rule 202.6 – Adequacy of Supply, and ISO Rule 302.1 – Real Time Transmission Constraint Management consultations, stakeholder responses and subsequent filings for those rules are forthcoming in Q4.

Optimizing the Grid

Top Priority Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2023
- Optimizing the Grid will continue to be part of ongoing base business

Objective
- Optimize use of existing grid and minimize need or extend timing out for new infrastructure while ensuring reliability and market access

Interdependencies
- Distribution Coordination
- Technology Integration
- Market Sustainability & Evolution

What we heard

- Stakeholders' support this as a top priority initiative including the publishing of capability maps, implementing optimization opportunities, streamlining the connection process, assessing dynamic line ratings and continued integrated system planning
- Supportive of the continued development of rules that will enable fast frequency response as an ancillary service
- Encourage the AESO to engage stakeholders early in the development process of its intended grid optimization improvements
- Stakeholders recommend reviewing critical information used in and produced by the connection queue
- Request for additional transparency in the planning process; including the communications of assumptions underlining planning forecasts
- Request for consideration of decarbonization analysis as part of this work
- Ensure AESO's plans will be adjusted accordingly based on the outcomes of Department of Energy's Bulk System Planning engagement

How we plan to proceed

- The Transmission Capability Mapping methodology and initial results at the substation level will be shared in Q1 2022, seeking improvements to next version
- The AESO has started with DFO related project improvements in the connection process in 2021 and will engage industry in 2022 for all connection types seeking red-tape reductions and addressing any level playing field concerns.
- The AESO is seeking flexibility in application of technology agnostic non-wires alternatives
- The AESO will assess dynamic line rating technologies in 2022 for implementation decision, if beneficial, starting in 2023
- The 2022 LTP will include an earlier stakeholder process for larger system NIDs, seeking feedback in Q1 2022 for improvements.
- The AESO will engage DER providers in future distribution coordination work.
- In 2022, the AESO will engage industry in a transmission utilization discussion including potential suitable annual metrics to share with industry.
- Investor confidence and FEOC remain foundational principles as the AESO seeks to optimize the grid.
- Our 2022 plans to optimize the network will be influenced by Department of Energy's decisions on the Bulk System Planning engagement and adjusted accordingly

Tariff Modernization

Top Priority Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2023
- Will be followed by the implementation of Tariff Modernization and any potential related Business Initiative

Objective
- Modernize ISO tariff price signals and simplify the ISO tariff to be more accessible, clear and agile

Interdependencies
- Red Tape Reduction
- Optimizing the Grid
- Distribution Coordination
- Technology Integration

What we heard

- Some stakeholders support the bulk and regional tariff rate redesign and modernization of the DOS rate while others think the rate redesign should be put on hold until the government completes their review on the Bulk System Planning (T-Reg) and Self-Supply and Export
- Recommendation of more technical evidence of modernizing the DOS rate
- Recommendation that the AESO work with stakeholders to develop a process to monitor, report and track transmission bypass costs which will show if this issue continues to grow and thereby increasing the overall cost of transmission for customers.
- Recommendation of any mitigation actions taken to reduce impacts to customers facing a large rate increase (e.g., loads, exporters) should not significantly shift costs on to other participants to support a minimally disruptive transition

How we plan to proceed

- File the Bulk and Regional tariff application by the required deadline, including Demand Opportunity Service (DOS) Modernization and a proposal for mitigating rate impacts for significantly impacted loads to support a minimally disruptive transition
- AUC proceeding on Bulk and Regional tariff application including DOS modernization
- Initiate consultation on changes to the Customer Contribution Policy
- Should Transmission Regulation changes result from the current government engagement, assess and initiate changes to the ISO tariff required to implement
- Progress other identified tariff structure and process improvements
- Additional information on the intent and proposed continued process for Tariff Modernization is also included

Distribution Coordination

Top Priority Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2024
- Distribution Coordination will continue to be part of ongoing base business

Objective
- Ensure coordination across the distribution and transmission system as the transformation evolves focused on optimizing transmission system while ensuring reliability and market access

Interdependencies
- Technology Integration
- Optimizing the Grid
- Tariff Modernization
- GTA
- Market Sustainability & Evolution

What we heard

- Stakeholders are supportive of this initiative including improving the coordination for development of the distribution system, implementing connection process improvements including probabilistic planning as it applies to the Tx/Dx planning coordination
- Recommendation to ensure a level playing field between transmission connected generation and distributed connected generation
- In connecting increasing numbers of DERs need to ensure the continued reliable operation of the Alberta grid
- Recommendation of a more open, coordinated, consistent and transparent engagement process (the who and how they will engage with stakeholders) on distribution coordination allowing stakeholders to better plan and prioritize their time and resources

How we plan to proceed

- The AESO is implementing DER technical interconnection requirements through existing DFO processes
- The AESO has started with DFO related project improvements in the connection process in 2021 and will engage industry in 2022 for all connection types seeking red-tape reductions and addressing any level playing field concerns
- Distribution coordination and DER roadmap related AESO initiatives will continue to be available on our website under Grid-Related Initiatives and we will seek to improve coordination and stakeholder engagement on these related initiatives
- 2022 will focus on probabilistic planning, connection process improvements, and exploring how distributed resources may assist in optimizing the grid.

Technology Integration

Top Priority Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2024
- Technology Integration will continue to be part of ongoing base business

Objectives
- Enable timely planned integration of new technologies onto the grid and into our markets
- Enable proactive awareness of future new technologies and the potential impacts to reliability, markets and tariffs

Interdependencies
- Tariff Modernization
- Market Sustainability & Evolution
- Optimizing the Grid
- Distribution Coordination
- Red Tape Reduction
- GTA

What we heard

- Stakeholders support this business initiative, but some do not believe it should be a top priority
- Ensure AESO is adhering to market design principle of technology neutrality
- Importance of developing and implementing energy storage rule changes and a clear tariff treatment
- Request that Technology Forward report include analysis of the potential impact of the electric vehicle penetration on the Alberta grid

How we plan to proceed

- Launch in Q4 2021 the AESO's first Technology Forward and Technology Summit, seeking feedback for improvement and identification of "deeper dive" technologies to assess in 2022
- Progress Energy Storage roadmap, including any AESO ES rule related changes
- Progress DER roadmap, including the remaining technical review areas
- The Department of Energy's ES stakeholder engagement may influence the ES roadmap priorities in 2022

Proposed: Grid Resiliency

Business Initiative (Top Priority)

Initial proposal
- Proposed new initiative for 2022

Anticipated completion
- 2022/2023

Objectives
- Enhance system frequency response
- Ensure extreme event preparedness across gas/electric interdependencies
- Identify additional reliability needs as supply transforms
- Assess need for climate adaptation plans
- Enhance cyber-security capabilities

Interdependencies
- Market Sustainability & Evolution
- Technology Integration

What we heard

- Stakeholders' support this as a top priority initiative (fundamental)
- Stakeholders support a risk-based approach
- Recommendation to conduct analysis to determine what (if any) new measures need to be pursued
- Recommendation to coordinate work plans with federal and provincial climate plans and related developments
- Recommendation to initiate steps to implement tested solutions such as specific NERC standards that facilitate planning requirements for extreme conditions and Geomagnetic Disturbance Events
- Recommendation that market participants be involved in early stages to ensure understanding the issues, evaluating the options, and developing a market-based approach going forward to ensure that the grid is resilient to the transformational changes that are happening with the supply mix, and how power plants are operating
- Recommendation to examine role of interties to Alberta's energy security and gird resiliency within this initiative as well DCG and NWS that extend beyond energy storage and how they can further support overall grid
- Request for consideration of decarbonization analysis to inform grid resiliency work

How we plan to proceed

- 2022 will focus on these initiatives, by priority:
  - Frequency response capability
  - Extreme event preparedness and gas/electric interdependency, including assessing NERC TPL related standards.
  - Future reliability needs to ensure resilience as grid transforms towards decarbonization followed in 2023+ on any needed market-based approaches on how to deliver those requirements
  - Cyber-security enhancements including assessing CIP 13 adoption in Alberta.
  - Assessing climate change implications on grid resilience including assessing need of NERC TPL-007-4 geomagnetic standard adoption in Alberta

Questions?

2022 Preliminary
Forecast and Budget Information

2022 Preliminary Forecast Transmission Operating Costs

Transmission Operating Costs Forecast Summary (updated)

($ millions) ~ by production year	2022 Forecast [1]	2021 Projected [2]	2021 BRP [3]	2020 Actual	2019 Actual
Wires Costs	1,896.7	1,674.6	1,933.8	1,903.6	1,951.8
Ancillary Services	210.1	361.2	198.3	182.5	212.9
Transmission Line Losses	143.3	190.8	104.4	91.8	107.8
TOTAL	**2,250.1**	**2,226.6**	**2,236.5**	**2,177.9**	**2,272.5**

Differences are due to rounding

[1] Forecast : Cost estimates for AESO Board approval for 2022

[2] Projected: Update of previous cost estimates for 2021

[3] 2021 AESO Budget Review Process (BRP) approved numbers for 2021

2022 Preliminary Forecast
Wires Costs

Wires Costs Summary
2022 Forecast (updated)

($ millions) ~ by production year	2022 Forecast	2021 Projected	2021 BRP	2020 Actual	2019 Actual
Wires	1,895.0	1,670.5	1,929.8	1,899.2	1,947.2
Invitation to Bid on Credit (IBOC)	0	2.1	2.0	2.1	2.1
Location Based Credit Standing Offer (LBC SO)	1.7	2.0	2.0	2.3	2.5
TOTAL	**1,896.7**	**1,674.6**	**1,933.8**	**1,903.6**	**1,951.8**

Differences are due to rounding

- Wires costs are the amounts paid to transmission facility owners (TFOs) in accordance with their Alberta Utilities Commission (AUC) approved tariffs and are not controllable costs of the AESO
- IBOC and LBC SO programs are long-term contracts that were initiated in 2001 and 2002 as incentives for generation to locate closer to major load centres

2022 Forecast Pool Price

Pool Price Forecast 2021 and 2022

- The hourly pool price forecast is an integral input for calculating the forecasted costs of ancillary services and transmission line losses
- For the 2022 BRP, the August to December 2021 and 2022 hourly pool price forecast is obtained from EDC Associates' Quarterly Forecast Update – Third Quarter 2021, released on August 16, 2021
- EDC is a commonly utilized industry information source

Pool Price Forecast
August to December 2021 and 2022

- Key assumptions in the EDC Associates' Quarterly Forecast Update – Third Quarter 2021 include:
  - Recent market fundamentals such as the effects of the extreme weather events, carbon pricing, mothballs / retirements / conversions of coal assets, outages of generation units or transmission assets, natural gas prices, and renewables additions
  - The forecast used a single seed from a sample of 50 seeds. The single seed that had an average annual price closest to the EDC summary annual price was chosen as the representative price curve
    - Single seed produces a price duration curve more representative of actual hourly price variability compared to average of all seeds

Pool Price Forecast
August to December 2021 and 2022

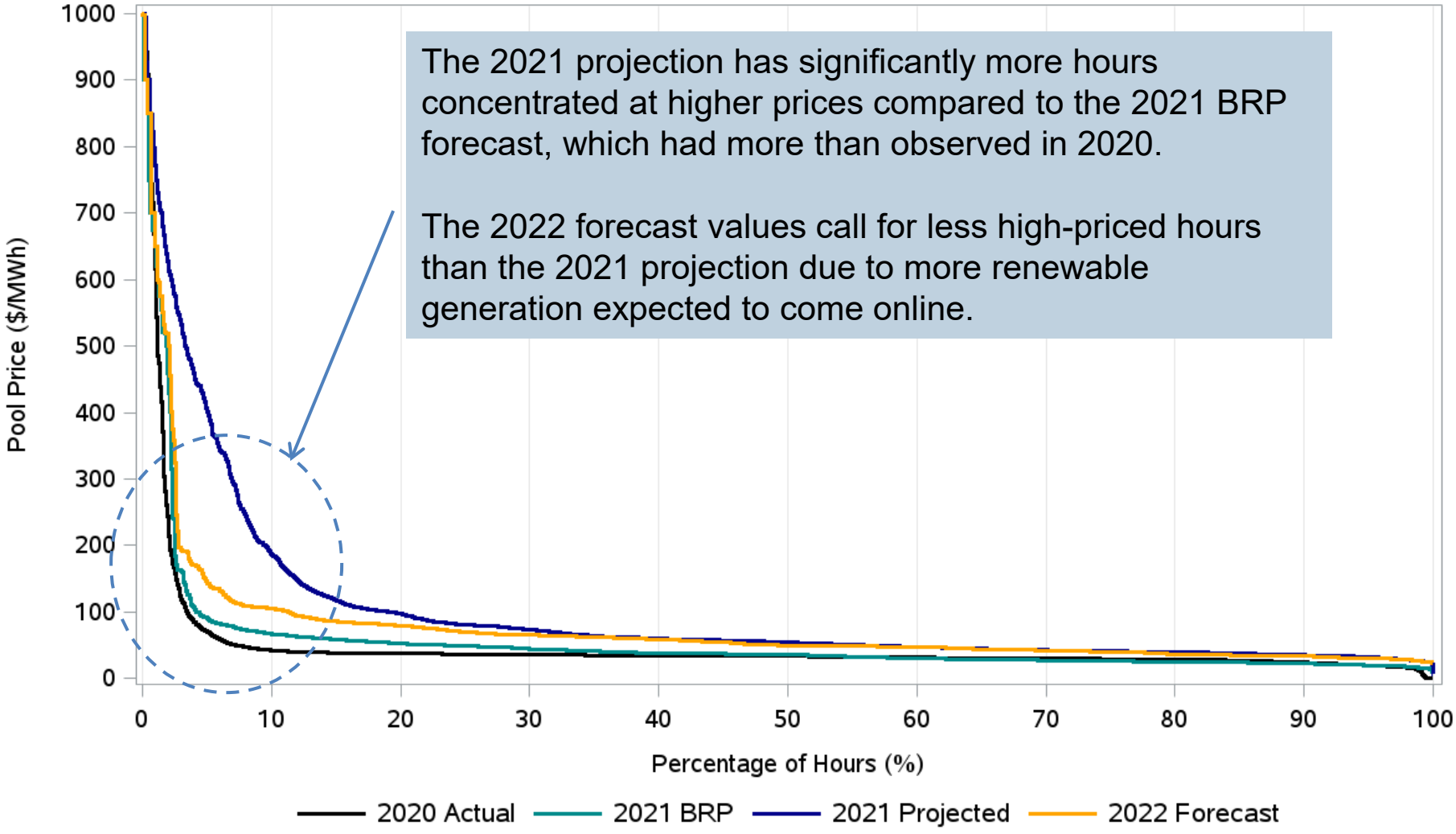
- As of July 30, 2021, the forward market price is similar to the EDC forecast for 2022

2021	EDC Forecast RoY	Forward Market RoY *	2021 Projected	2021 BRP
Average Hourly Pool Price ($ /MWh)	91.23	88.65	98.37	53.93
AECO-C Natural Gas Price ($ /GJ)	3.85	3.84	3.38	2.30

2022	EDC Forecast	Forward Market*
Average Hourly Pool Price ($ /MWh)	74.01	72.25
AECO-C Natural Gas Price ($ /GJ)	3.10	3.21

RoY – remainder of year - corresponds to August to December 2021
* Source: NGX (Jul 30th, 2021)

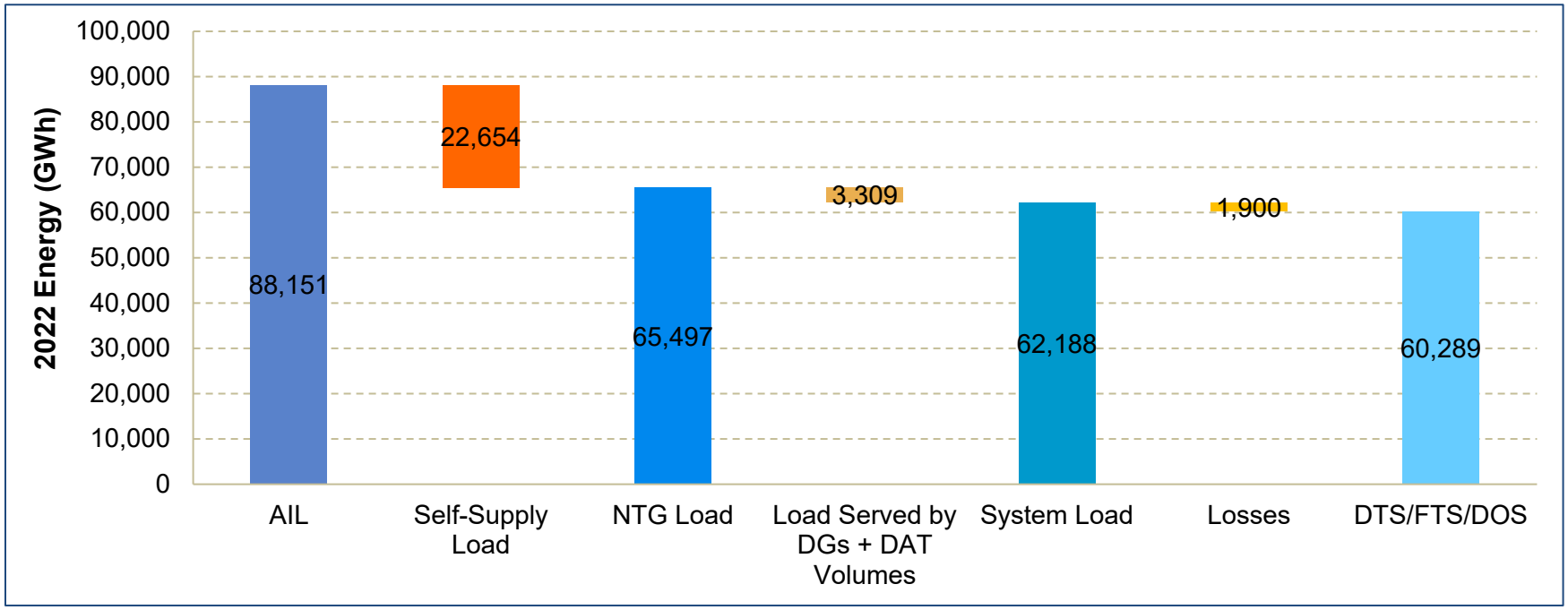
Pool Price Duration Curves



2022 Load Outlook

Load Measurement Definitions

- **Alberta Internal Load (AIL)**: System load plus load served by on-site generating units, including those within an industrial system and the City of Medicine Hat
  - Input in the OR volumes forecast (active contingency reserves during high imports)
- **Net-to-grid (NTG) Load:** System Load + Load Served by Distributed Generation (DGs) > 5 MW and Duplication Avoidance Tariff (DAT) Volumes
  - One of the primary inputs in the OR volumes forecast (active contingency reserves)
- **System Load:** DTS/FTS/DOS Net Load + Transmission Line Losses Volumes ("Losses")
  - Input in the energy market trading charge process



Load Outlook

- As part of the BRP process, the AESO prepares a near term load outlook as context for the AESO's cost forecasts
- 2021-2022 load outlook considers:
  - Alberta real GDP, population, and employment predictions from the CBoC August 2021 Outlook
  - Oilsands production from the July 2021 IHS forecast
  - The impact of the pandemic on load
  - Historic weather patterns (P50 weather)
  - Calendar effects
  - Time-series trend variables
- Alberta Internal Load (AIL) is estimated to:
  - Increase by 3.8% from 2020 to 2021
  - Increase by 2.1% from 2021 to 2022

Load Outlook (cont.)

- In 2022 AIL is expected to increase due to:
  - An optimistic recovery speed in 2021 and a following gain in 2022, supported by forecasted growth in the economy and employment, and forecasted oilsands production growth

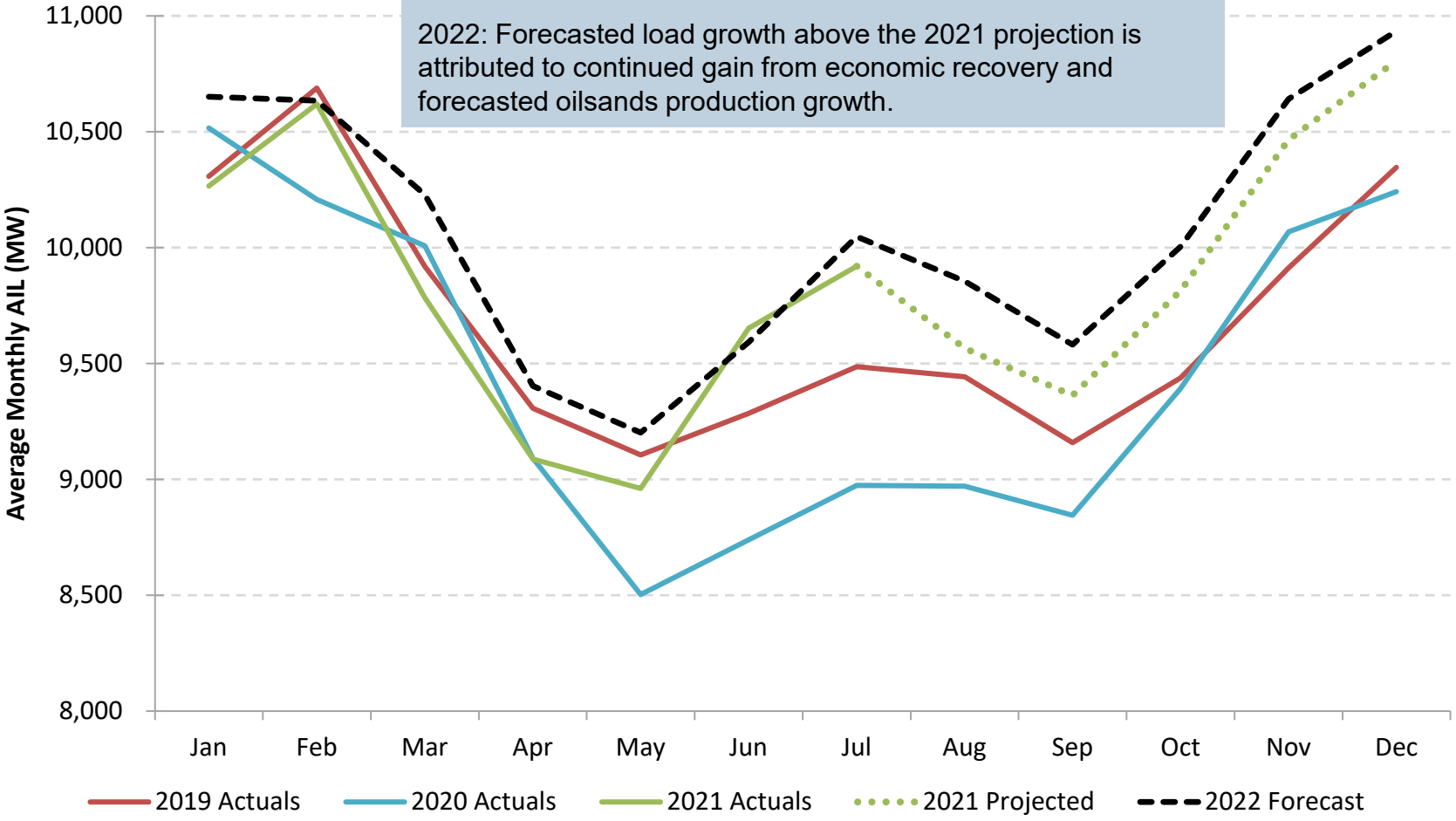
(GWh)	2022 Forecast	2021 Projected	2021 BRP	2020 Actual	2019 Actual	2018 Actual
AIL Volumes	88,151	86,330	83,784	83,115	84,925	85,330
Per cent change (YoY)	2.1%	3.8%*	0.8%	-2.1%	-0.5%	-

YoY = Year over Year
* 2021 projected compared to 2020 actual

Load Outlook (cont.)

2021: Projected increase compared to 2020 historic volumes due to the ongoing economic recovery from the pandemic and higher oilsands production.

2022: Forecasted load growth above the 2021 projection is attributed to continued gain from economic recovery and forecasted oilsands production growth.



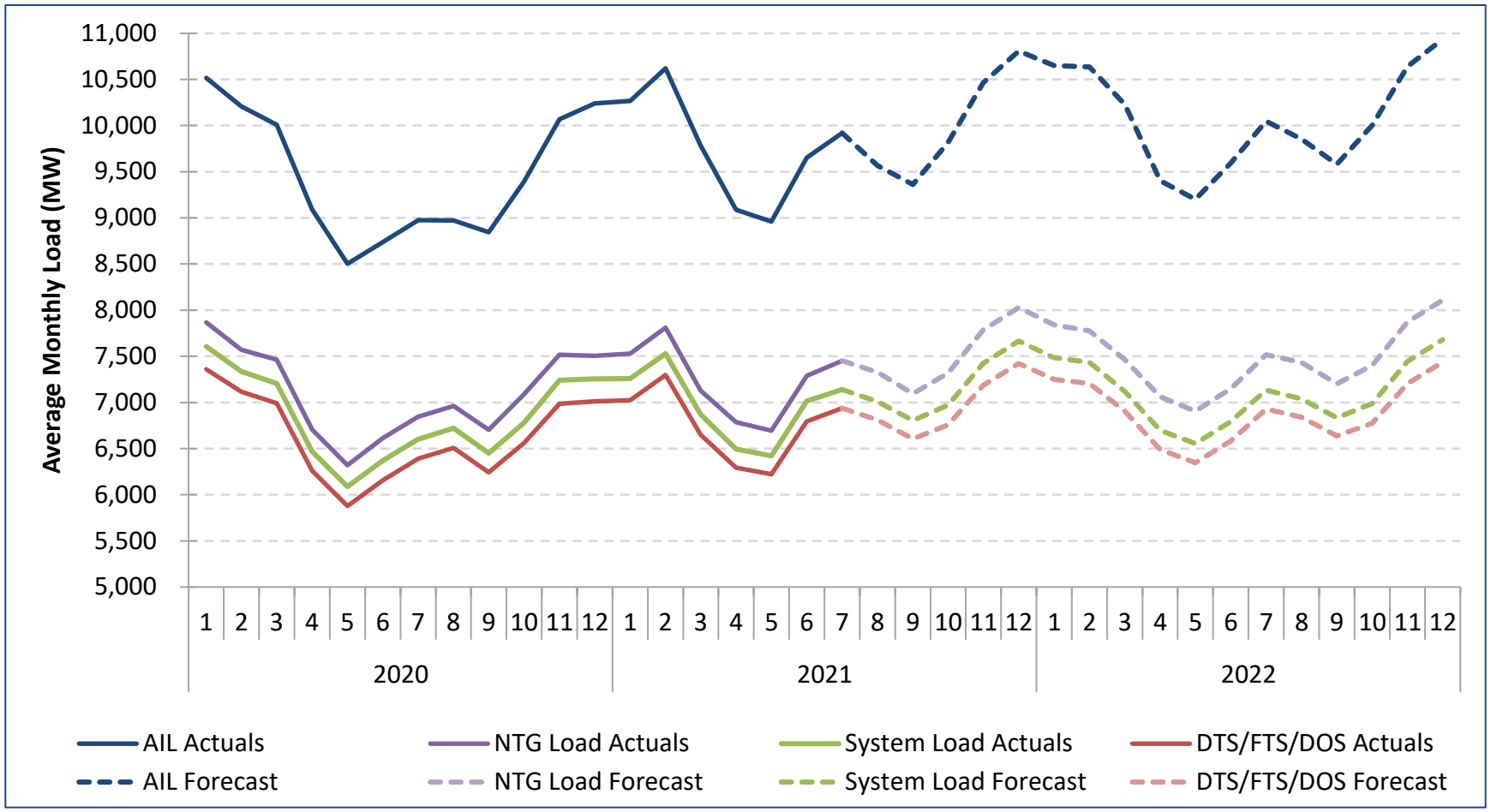
Load Outlook (cont.)

- In 2022 load is expected to increase primarily due to:
  - An expected recovery from the pandemic
  - Economic and employment growth

GWh Volume	2022 Forecast	2021 Projected	2020 Actual	2019 Actual	2018 Actual
AIL (% YoY growth rate)	88,151 (2.1%)	86,330 (3.8%)	83,115 (-2.1%)	84,925 (-0.5%)	85,330
NTG Load (% YoY growth rate)	65,497 (1.7%)	64,394 (3.3%)	62,337 (-1.9%)	63,554 (-2.0%)	64,876
System Load (% YoY growth rate)	62,188 (0.7%)	61,738 (2.7%)	60,112 (-2.3%)	61,554 (-2.2%)	62,926
DTS, FTS, & DOS (% YoY growth rate)	60,289 (0.8%)	59,838 (2.9%)	58,164 (-2.5%)	59,680 (-2.3%)	61,058

Load Outlook (cont.)

- All load measurements have a similar shape



2022 Preliminary Forecast
Ancillary Services Costs

Forecast Methodology: Operating Reserves (OR)

- All OR products are forecast
  - Active: spinning, supplemental and regulating,
  - Standby: spinning, supplemental, and regulating (including activations)
- Forecast OR costs is the sum of forecast hourly volumes multiplied by the hourly OR price

$$cost = \sum_{\substack{hour,\\ product}} volume * OR\ price$$

- **Volumes**: set by Alberta Reliability Standard requirements and dependent on forecast generation, load, and imports
  - Using a forecast of net-to-grid load and generation consistent with the AESO's day-ahead forecast, and import level assumptions, all active contingency reserves are forecast based on ARS requirements
  - Using the formulas that outline standby contingency reserves volumes, all standby contingency reserve volumes are forecast
  - Using the formulas that outline regulating reserves volumes in each hour, all regulating reserve volumes are forecast
- **OR price**: hourly price of operating reserves determined for each product type
  - Based on the relationship between pool price levels and OR premiums (discounts) of the previous two years

2022 Forecast Ancillary Services Cost Summary (updated)

($ millions) ~ by production year	2022 Forecast	2021 Projected	2021 BRP	2020 Actual	2019 Actual
Operating Reserve (OR)	169.3	319.0	159.9	144.8	187.1
Load Shed Service for Imports (LSSi)	29.4	29.8	32.6	28.3	16.1
Contracted Transmission Must-run (TMR)	-	-	-	3.0	3.0
Conscripted Services (OR and TMR)	5.0	5.0	0.4	0.7	0.3
Reliability Service	2.9	2.9	2.9	2.9	2.9
Black Start	2.5	2.5	2.4	2.3	2.3
Transmission Constraint Rebalancing (TCR)	1.0	2.0	0.1	0.5	0.3
Poplar Hill	-	-	-	-	0.9
TOTAL	**210.1**	**361.2**	**198.3**	**182.5**	**212.9**

Pool Price ($ /MWh)	74.01	98.37	53.93	46.72	54.88
Gas Price ($ /GJ)	3.10	3.38	2.30	2.12	1.68

Refer to the Supplementary 2022 Forecast and Budget Information document for additional details including forecast methodologies and variance explanations.

2022 Preliminary Forecast
Transmission Line Losses Costs

Forecast Methodology: Line Losses

- Forecast transmission line losses costs is the sum of hourly volumes multiplied by hourly pool prices

$$cost = \sum_{hour} volume * pool\ price$$

- **Volumes**: derived from a statistical model that utilizes an economic outlook, weather (P50), and calendar effects
  - This model maps out the relationship between historic load drivers and losses
- **Pool price**: hourly; pool price provided by EDC

Transmission Line Loss Costs Summary (updated)

($ millions) ~ by production year	2022 Forecast	2021 Projected	2021 BRP	2020 Actual	2019 Actual
Cost ($ million)	143.3	190.8	104.4	91.8	107.8
Volume (GWh)	1,900	1,901	1,880	1,947	1,894
Pool Price ($ /MWh)	74.01	98.37	53.93	46.72	54.88

- Transmission losses volumes in 2021 are projected to be slightly higher than the 2021 BRP
- Losses volumes in 2022 are expected to be at similar level to the 2021 projected volumes

2022 Preliminary
General and Administrative Budget

AESO Own Cost Summary

($ millions) ~ by production year	2022* Budget	2021** Projected	2021 BRP	2020 Actual	2019 Actual
General & Administration	95.7	92.8	91.7	88.3	104.4
Interest***	2.8	47.0	3.5	37.8	5.4
Amortization	24.6	28.2	26.2	30.7	38.8
Total	**123.1**	**168.0**	**121.4**	**156.8**	**148.6**

Differences are due to rounding

*Preliminary
**Based on Q3 2021 Forecast prepared in July 2021
***2020 Actual and 2021 Projected Interest include $33.7 million and $44.5 million, respectively, of interest costs related to Loss Factor resettlements, which were largely offset by interest revenues not presented here. Excluding these balances, 2020 Actual and 2021 projected interest are $4.1 million and $2.5 million, respectively.

General and Administrative 2022 Budget Process

- AESO prepares its Own Cost budget based on the business planned for the budget year
- The AESO's business initiatives were discussed at the Aug. 26, 2021 BRP meeting
- Assessments of required resources both internally and externally are evaluated on various criteria. These include, but are not limited to:
  - Resource requirements to deliver on key business initiatives
  - Consideration of specialized knowledge, skills or cost-effective resources
  - Resource constraints due to workflow and timing of initiatives, and
  - Risk mitigation requirements
  - Resources are assessed on a holistic basis

General and Administrative Budget Considerations

- Ensuring reliability of AIES is critical
- Focus on delivery of key initiatives as discussed with stakeholders:
  - External Initiatives
    - Market Sustainability and Evolution
    - Settlement Audit
    - Red Tape Reduction
    - Optimizing the Grid
    - Tariff Modernization
    - Distribution Coordination
    - Technology Integration
    - Grid Resiliency (Proposed for 2022)
  - Internal Initiatives
    - Continued work and effort is provided to a variety of internal initiatives in addition to the external initiatives noted above
    - Internal initiatives are aligned with strengthening our core business in areas such as markets and competition, grid resiliency, data and digitalization and external engagement
- Driven by the successful delivery of the key corporate initiatives while maintaining our high standards of reliability

Other Budget Information (updated)

- Budgeted proposed general and administrative (G&A) costs for 2022 are $4.0 million (4%) higher than budgeted 2021 costs due to:
  - Increase in facility operating costs
  - Increase in insurance costs due to increasing pressure in the market
  - Staff resources required to advance strategic initiatives, particularly in grid optimization around congestion analysis where the long-term cost benefit to Albertans of pushing out transmission costs could generate significant cost savings. Additional pressure was created through sustained and growing connection volumes
  - Offset by decreases in consulting, legal and audit costs, and computer services, maintenance and telecom
- Forecasted G&A costs for 2021 are higher than budgeted expectations due to lower vacancy rates than historical, offset by net decreases in all other areas due to strategic efforts to minimize and/or defer spend, as well as the impacts of COVID-19 on timing and completion of work and administrative costs given a remote work environment
- The trading charge for 2022 is lower than 2021, reflecting the refund of a projected overcollection in 2021 as well as reduced allocations of budgeted 2022 costs to the Energy Market

General & Administrative Costs

($ millions) ~ by production year	2022 Budget*	2021 Projected **	2021 BRP	2020 Actual	2019 Actual
Staff Costs	68.9	67.5	64.3	65.7	77.7
Contract Services & Consultants	4.5	4.4	5.4	3.7	5.5
Administrative	5.5	4.2	5.2	3.2	4.3
Facilities	4.5	4.4	4.0	4.1	3.9
Computer Services and Maintenance	10.9	11.0	11.3	10.2	11.5
Telecommunications	1.4	1.4	1.5	1.4	1.5
Total	95.7	92.8	91.7	88.3	104.4

Differences are due to rounding

*Preliminary
** Based on Q3 2021 Forecast prepared in July 2021

2022 Reconciliation to 2021 Budget (updated)

($ millions)		
2021 Approved Budget		**91.7**
Staff costs (Resources required to advance strategic initiatives, particularly in grid optimization around congestion analysis, grid resilience, and for connection queue management)	4.5	
Insurance	0.4	
Facility operating costs	0.5	
Net decrease in consulting, legal and audit	(0.9)	
Reduction in computer services, maintenance & telecom	(0.5)	
2022 Preliminary Budget		**95.7**

Differences are due to rounding

2022 Consulting & Legal Costs and Capital Costs by Business Initiative

	Consulting Cost* ($ Million)	Capital Cost* ($ million)
Market Sustainability and Evolution	0.1	0.5
Settlement Audit	0.1	-
Red Tape Reduction	-	-
Optimizing the Grid	0.2	-
Tariff Modernization	0.6	-
Distribution Coordination	-	-
Technology Integration	0.1	0.5
Grid Resiliency (Proposed for 2022)	0.3	9.5
Total Direct Costs	**1.4**	**10.5**

Differences are due to rounding

*Preliminary

Preliminary Other Industry Costs

($ millions) ~ by production year	2022 Budget*	2021 Projected	2021 BRP	2020 Actual	2019 Actual
AUC Fees – Transmission	10.3	9.8	11.3	10.8	11.5
AUC Fees – Energy Market	7.9	7.3	6.6	7.2	7.9
Regulatory Process Costs	3.5	1.9	1.3	2.5	6.1
WECC/NWPP/NERC** Costs	2.5	2.3	2.2	2.2	2.1
Total Costs	**24.1**	**21.3**	**21.4**	**22.7**	**27.7**

Differences are due to rounding

* Preliminary
** Western Electricity Coordinating Council / Northwest Power Pool / North American Reliability Corporation

2022 Preliminary Energy Market Trading Charge

Trading Charge Components (¢ per MWh)	2022 Budget	2021 Actual	2020 Actual	2019 Actual	2018 Actual	2017 Actual	2016 Actual
AESO Costs	23.0	28.5	29.8	34.7	23.7	26.2	26.2
Energy Market Deficit (Surplus)*	(2.8)	1.2	6.6	3.0	(5.5)	-	-
Total AESO Component	20.2	29.7	36.4	37.7	18.2	26.2	26.2
AUC's Portion of Energy Market Administration Fee	6.3	5.4	6.2	4.8	3.2	5.3	5.3
Total	**26.5**	**35.1**	**42.6**	**42.5**	**21.4**	**31.5**	**31.5**

Differences are due to rounding

This information does not include the Market Surveillance Administrator (MSA). The MSA cost recovery amount is approved by the Chair of the AUC in an independent budget process.

* Surplus to be refunded in 2022 resulting from 2021 variances in volumes vs forecast and costs allocated to Energy Market vs budgeted allocation.

2022 Preliminary Energy Market Trading Charge – Recoverable Costs

Trading Charge Components (Recoverable Costs – in $millions CAD)	2022 Budget	2021 As Posted
AESO Costs	$28.5	$34.3
Energy Market Deficit (Surplus)*	(3.5)	1.5
Total AESO Component	$25.0	$35.8
AUC's Portion of Energy Market Administration Fee	7.9	6.6
Total	**$32.9**	**$42.4**

Differences are due to rounding

This information does not include the Market Surveillance Administrator (MSA). The MSA cost recovery amount is approved by the Chair of the AUC in an independent budget process.

* Surplus to be refunded in 2022 resulting from 2021 variances in volumes vs forecast and costs allocated to Energy Market vs budgeted allocation.

2022 Preliminary Capital Budget

Preliminary Capital Budget Summary

($ millions)	2022* Budget	2021 Projected	2021 BRP	2020 Actual	2019 Actual
Key Capital Initiatives	12.5	7.5	9.9	10.6	17.4
Other Capital Initiatives	10.6	12.2	10.7	7.8	3.7
Life Cycle Funding	5.1	4.1	4.7	4.7	7.7
Total General Capital	**28.2**	**23.9**	**25.3**	**23.2**	**28.9**
Major Project – SCC**	-	-	-	-	11.5
Total Capital	**28.2**	**23.9**	**25.3**	**23.2**	**40.3**

Difference are due to rounding

* Preliminary

**System Coordination Centre (SCC) Expansion - Major project completed Q4 2019. Ongoing operation thereafter.

Capital Budget Categories

Key Capital Initiatives – Most critical projects that the AESO believes must be completed within the timeframe identified

Other Capital Initiatives – Other projects that have more flexibility in planning or delivery so timing is not as critical

Life Cycle Funding – Leasehold improvements, hardware replacements (end of useful life) and recurring software upgrades

Major Project – Significant multi-year project requiring separate Board approval

Other Budget Information (updated)

- Budgeted proposed capital cost for 2022 are $2.9 million (11%) higher than budgeted 2021 costs due to ongoing EMS sustainment initiatives
- Projected capital costs for 2021 are $1.4 million (6%) lower than budgeted expectations due to the impacts of COVID-19 on timing and completion of work. This is in addition to strategic efforts to minimize and/or defer spend

Preliminary Capital Budget

($ millions)	2022 Budget*	2021 Projected	2021 BRP	2020 Actual	2019 Actual
Key Capital Initiatives	**12.5**	**7.5**	**9.9**	**10.6**	**17.4**
1. Business System Modernization	1.0	0.9	1.0	-	-
2. Cyber Security and Critical Infrastructure Protection	1.6	1.0	1.1	1.3	1.2
3. Optimizing the Grid	-	0.3	1.2	-	-
4. Technology Integration	0.5	-	0.4	-	-
5. Market Sustainability and Evolution	0.5	-	-	-	-
6. **EMS Sustainment	8.9	5.2	6.3	5.0	5.3
7. Market Evolution – Other	-	-	-	0.2	1.7
8. Productivity Applications and Tools	-	-	-	3.2	-
9. Critical Systems External Interface Modernization	-	-	-	0.9	-
10.Capacity Market	-	-	-	-	9.1
Other Capital Initiatives	**10.6**	**12.2**	**10.7**	**7.8**	**3.7**
Life Cycle Funding	**5.1**	**4.1**	**4.7**	**4.7**	**7.7**
Total General Capital	**28.2**	**23.9**	**25.3**	**23.2**	**28.9**
Major Project – SCC	-	-	-	-	11.5
Total Capital	**28.2**	**23.9**	**25.3**	**23.2**	**40.3**

Difference are due to rounding *Preliminary

**Energy Management System (EMS) - Major project implemented in 2017. Ongoing sustainment activity for years 2018-2022.
***Market System Replacement and Reengineering

Preliminary Capital Budget
Other Capital Initiatives – Summary

- Other application or infrastructure upgrades
  - Facilities – refurbishments and security related
  - System Enhancements Programs
  - Operational Effectiveness
  - System Controller Effectiveness
  - Business technology solutions
    - Records management
    - Personal Productivity tools
    - Forecasting software
    - Governance, Risk and Compliance (GRC) tool
    - Various other

Preliminary Capital Budget
Life Cycle Funding - Summary

- Ongoing investment in general infrastructure and application platforms
  - Communications
  - Database
  - Application middleware
  - End-user computing
  - Enterprise services
  - Monitoring
  - Network
  - Non-project capital
  - Servers
  - Storage

Management Controls and Contingency

Management Controls and Contingency

Results of Forecast	Related Budget Process
If the forecast is below or in line with the previously approved budget amount	At management's discretion, any under-budget amounts will be used to advance future year business priorities or will be accumulated in the deferral accounts
If the forecast is above the previously approved budget amount and the amount is determined to be a 'manageable variance'	Management would request approval from the AESO Board and subsequently issue a stakeholder communication
If the forecast is above the previously approved budgeted amount and the amount is in excess of a 'manageable variance'	Management will review the new funding requirements with stakeholders, followed by a request for approval from the AESO Board

A '**manageable variance**' is a forecast to actual variance that would be:

- Less than 10% of budgeted general and administrative expenditures
- Less than 20% of budgeted capital

Questions?

Session Close-out and Next Steps

Session feedback

- We want to thank you for attending the 2022 BRP Stakeholder Engagement Session 2 and we would appreciate your feedback on the session
- Launch poll
- We invite all interested stakeholders to provide their input on this session, the business initiatives and the 2022 preliminary forecasts and budgets via the questions set out in the **Stakeholder Comment Matrix 2022 BRP Session 2 on or before Oct. 15, 2021**. The comment matrix will be available on Sept. 29, 2021 on our website at www.aeso.ca
  - Path: AESO > Business Planning
- The AESO will review, consider and respond to stakeholder feedback received. The responses to feedback will be posted on Nov. 2, 2021, on our website

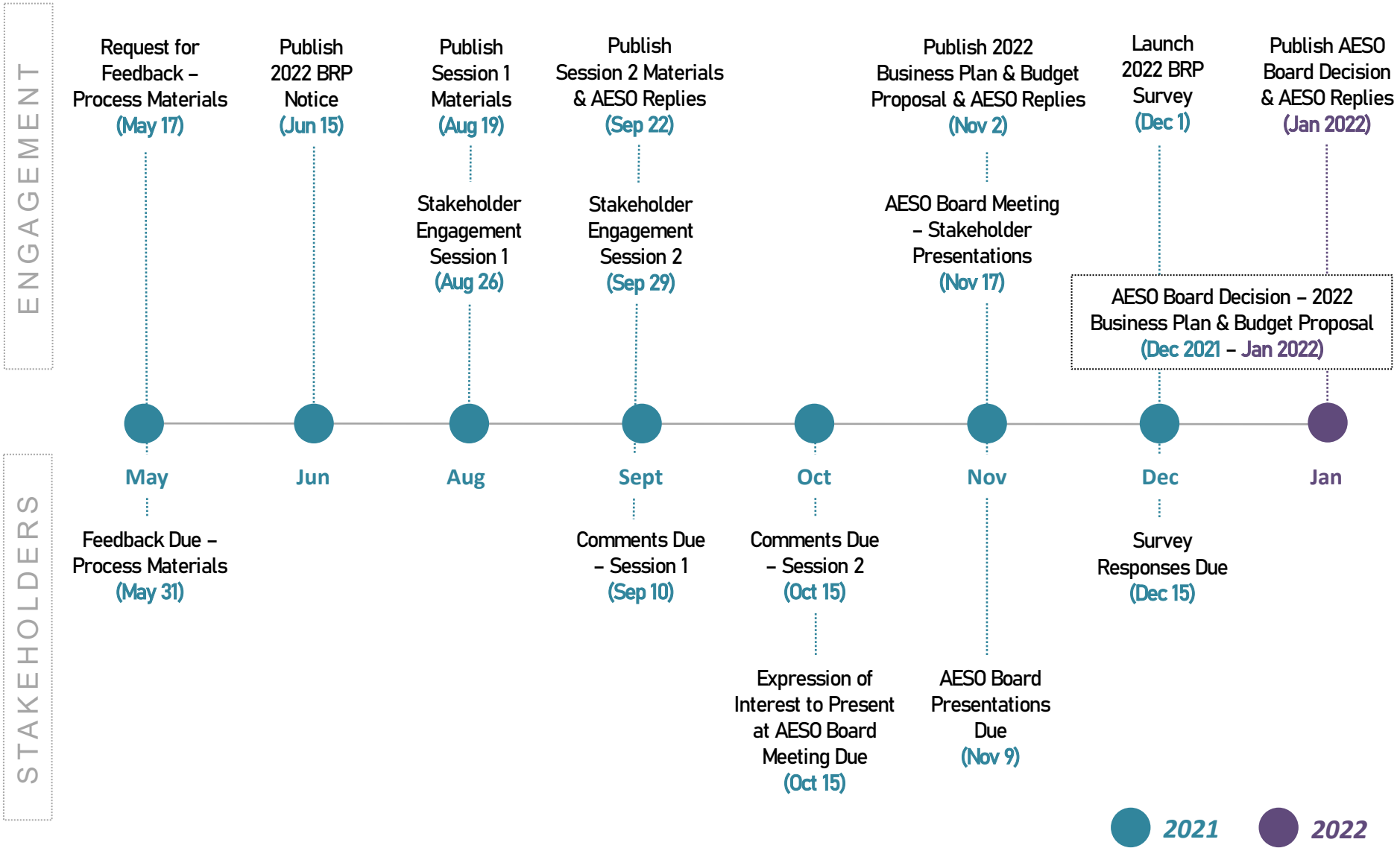
Overall engagement survey

- In December 2021, the AESO will launch a survey to seek stakeholder input on the overall 2022 Budget Review Process engagement process. The survey will be available on our website at www.aeso.ca
- **Purpose**
  - The purpose of the survey is to seek stakeholder input on the overall engagement process for the 2022 Budget Review Process to guide the AESO as we continuously work to improve how we engage stakeholders to ensure our approach allows stakeholders' needs and interests to be consistently, transparently and meaningfully considered
- At that time, we invite all interested stakeholders to share their perspectives on this overall engagement
  - Path: AESO > Business Planning

Timeline of next steps

- **Oct. 15, 2021 |** Stakeholder feedback due on questions set out in Stakeholder Comment Matrix 2022 BRP Session 2
- **Oct. 15, 2021 |** Stakeholder expression of interest due on presenting at the AESO Board Meeting as per the 2022 BRP Terms of Reference
- **Nov. 2, 2021 |** Publish the AESO's *2022 Business Plan and Budget Proposal* and the AESO replies on our website
- **Nov. 9, 2021 |** Stakeholder presentations due for those stakeholders who expressed an interest in presenting to the AESO Board
- **Nov. 17, 2021 |** Stakeholders, who expressed an interest and submitted a presentation, to present at AESO Board Meeting
- **Dec. 1-15, 2021 |** 2022 BRP survey launched and stakeholder responses due
- **January 2022 |** Publish AESO Board Decision and AESO replies on our website
  - Email stakeholder feedback, expression of interest and presentations to karen.campbell@aeso.ca

Stakeholder engagement schedule



Questions?

Contact the AESO

- ***Twitter:*** *@theAESO*
- ***Email:*** *stakeholder.relations@aeso.ca*
- ***Website:*** *www.aeso.ca*
- Subscribe to our stakeholder newsletter

Thank you

Appendix A – Acronyms

Acronyms

- ALM = Adjustment for Load on the Margin
- AMP = Adjusted Metering Practice
- AS = Ancillary Services
- AUC = Alberta Utilities Commission
- CETO = Central East Transfer-out Transmission Development
- CIP = Critical Infrastructure Protection
- CRPC = Chapel Rock-to-Pincher Creek Transmission Development
- DAR = Deferral Account Reconciliation
- DCG = Distribution-Connected Generation
- DER = Distributed Energy Resources
- DFO = Distribution Facility Owner
- DOE = Department of Energy
- DOS = Demand Opportunity Service
- ES = Energy Storage
- ETS = Energy Trading System
- FEOC = Fair, Efficient and Openly Competitive
- GoA = Government of Alberta
- GTA = General Tariff Application
- LTP = Long-term Transmission Plan
- NID = Needs Identification Document
- NWS = Non-Wires Solution
- OR = Operating Reserve
- PENV = Provost to Edgerton and Nilrem to Vermilion Transmission Development
- POD = Point-of-Delivery

Appendix B – 2022 BRP Session 1 Business Initiatives

General Tariff Application (GTA)

Mandated – Top Priority Business Initiative – Complete 2021

Initial proposal
- In progress

Anticipated completion
- 2021
- GTA will continue to be part of ongoing base business

Objective
- Implement approved tariff provisions from 2018 GTA into connection process and AESO business

Interdependencies
- Tariff Modernization
- Technology Integration
- Distribution Coordination

2021

Update
- On April 29, 2021, the AUC issued Decision 26215-D01-2021 (as varied in Decision 26215-D02-2021 issued on June 3, 2021) approval of the compliance filing relating to substation fraction equal to one (SSF=1) and Adjusted Metering Practice (AMP)
- Revised ISO tariff took effect on July 1, 2021. Effective date for the commencement of ISO tariff billing applied to specific market participants will be subject to the AUC determinations on the AESO proposed AMP implementation plan
- Addressed the unlimited liability concern for distribution-connected generation (DCG) and an election period for transition to the new tariff, providing greater certainty to investors

Next Steps for 2021
- Develop an AMP implementation plan with revisions to the metering rule and file with AUC
- Engage stakeholders and file System Project Cost Criteria

2022

2022 Base Business Activities Plan
- File the AMP implementation plan with revisions to the metering rule with the AUC by January 1, 2022
- Implementation of the AMP as part of AESO business

Market Sustainability and Evolution

Business Initiative

Initial proposal
- In progress
- Merged Market Sustainability & Evolution I & II and OR Market Competitiveness Enhancement from 2021 BRP

Anticipated completion
- 2022 (dependent on findings)
- Implementation will follow, if determined to be required

Objective
- To maintain the long-term sustainability and competitiveness of the energy-only market structure and to enable the integration of new technologies with a long-term view of potential market changes needed to facilitate continued resource adequacy and increased flexibility with an ever increasing variable system

Interdependencies
- Technology Integration

2021

Update
- Based on results from conducted analyses, Ramp Table and Dispatch Tolerance are to be deferred.
- Internal analysis of OR Market Competitiveness underway
- Mothball Rule engagement progressing

Next Steps for 2021
- Continued stakeholder engagement on the proposed changes to ISO rule Section 306.7 Mothball Outage Reporting
- Initiate stakeholder engagement on any identified OR market design changes and corresponding ISO rule changes to enhance competition

2022

2022 Proposed Plan and Milestones
- Progress proposed changes to ISO rule Section 306.7 Mothball Outage Reporting to AUC
- Progress proposed changes to implement OR Market Competitiveness recommendations
- Release update to System Flexibility Assessment Report, based on 2021 LTO and scenarios
- Identify other required market initiatives to support long-term sustainability and competitiveness of the energy-only market structure, with a long-term view of potential market changes needed to facilitate continued resource adequacy and increased flexibility with an increasingly variable system (e.g., price cap and floor review, new AS products, dispatch tolerance)

Settlement Audit

Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2022
- Settlement Audits will become part of ongoing base business

Objective
- Perform an audit of the AESO's financial settlement processes

Interdependencies
- No interdependencies

2021

Update
- Audit deferred to early 2022 due to COVID-19 and other priorities; however, readiness component is still in progress

Next Steps for 2021
- Complete readiness component of Settlement Audit

2022

2022 Proposed Plan and Milestones
- Complete Settlement Audit

Red Tape Reduction

Mandated – Top Priority Business Initiative

Initial proposal
- Mandated in 2020

Anticipated completion
- March 31, 2023
- Red tape will become part of ongoing base business

Objective
- To be in compliance with the GoA *Red Tape Reduction Initiative*, the AESO is committed to reducing regulatory requirements by one-third by March 31, 2023

Interdependencies
- Tariff Modernization
- Technology Integration

2021

Update
- The workplan, prepared in 2020, outlines the sequence of documents to be reworked or removed in order to reduce regulatory requirements as per the Government of Alberta's schedule
- Implementation of the workplan has resulted in a reduction of requirements by 6,820 (22.5%) as of Q2 2021
- Estimated industry cost and time savings to date of $350K and 2,200 hours, respectively

Next Steps for 2021
- Continue to advance the workplan with a reduction in requirements via AESO initiated changes to non-authoritative documents in addition to changes that will need to be filed with the AUC for approval, specifically noting the following ISO rules which have one hundred plus requirements in terms of reductions
  - Section 201.6 Pricing
  - Section 202.6 Adequacy of Supply

2022

2022 Proposed Plan and Milestones
- Continue to advance the workplan, specifically noting the following ISO rules which have one hundred plus requirements in terms of reductions
  - Section 203.1 Offers and Bids for Energy
  - Section 304.9 Wind and Solar AGF Forecasting
  - Engineering Connection Assessment

Optimizing the Grid

Top Priority Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2023
- Optimizing the Grid will continue to be part of ongoing base business

Objective
- Optimize use of existing grid and minimize need or extend timing out for new infrastructure while ensuring reliability and market access

Interdependencies
- Distribution Coordination
- Technology Integration
- Market Sustainability & Evolution

2021

Update
- Using congestion analysis to identify the timing of the planned transmission projects and maximize use of existing infrastructure. Pursuing use of flow control devices and line rating upgrades as low-cost solutions to defer new infrastructure.
- Developing the 2022 Long-term Transmission Plan (LTP) focused on risk-based scenarios and optimizing existing network
- Improve system frequency response following a disturbance.
- Cost saving potential for deferring system projects such as PENV, CETO and CRPC

Next Steps for 2021
- Seek enhanced flexibility to further optimize the network by engaging in the DOE Bulk System Planning engagement
- Create methodology to develop substation level transmission capability maps
- Continuing to develop the 2022 LTP to be published in early 2022

2022

2022 Proposed Plan and Milestones
- Publish 2022 LTP and seek stakeholder feedback
- Update stakeholder engagement process on material system NIDs
- Publish first Transmission Capability Map at substation level, coordinated with DFO hosting capability
- Streamline connection process with measurable time and resource savings
- Assess dynamic line rating methodologies and decide on path forward
- Implement any optimization opportunities enable from DOE Bulk System Planning engagement

Tariff Modernization

Top Priority Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2023
- Will be followed by the implementation of Tariff Modernization and any potential related Business Initiative

Objective
- Modernize ISO tariff price signals and simplify the ISO tariff to be more accessible, clear and agile

Interdependencies
- Red Tape Reduction
- Distribution Coordination
- Technology Integration

2021

Update
- Stakeholder engagement continued on Bulk and Regional Tariff Design. To better address stakeholder feedback, respond to issues raised by AUC staff, and other considerations, the AESO filed a submission with the AUC to extend the filing date of the Bulk and Regional tariff from June 30, 2021 to October 15, 2021, or within eight weeks of the AESO's last stakeholder session, whichever is later
- On June 1, 2021 the AUC issued an approval to the requested extension to October 15, 2021

Next Steps for 2021
- Continue to work on the Bulk and Regional tariff application to pursue a filing by the date as stated, including Demand Opportunity Service (DOS) Modernization and a proposal for mitigating rate impacts for significantly impacted loads to support a minimally disruptive transition

2022 and 2023

2022 Proposed Plan and Milestones
- AUC proceeding on Bulk and Regional tariff application including DOS modernization
- Initiate consultation on changes to the Customer Contribution Policy
- Progress other identified tariff structure and process improvements
- Additional information on the intent and proposed continued process for Tariff Modernization is also included

2023 Proposed Milestones
- AUC Decision and AESO compliance filing on Bulk and Regional tariff application including DOS modernization

Distribution Coordination

Top Priority Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2024
- Distribution Coordination will continue to be part of ongoing base business

Objective
- Ensure coordination across the distribution and transmission system as the transformation evolves focused on optimizing transmission system while ensuring reliability and market access

Interdependencies
- Technology Integration
- Optimizing the Grid
- Tariff Modernization
- GTA
- Market Sustainability & Evolution

2021

Update
- Q2 published AESO's Decision-Making Framework for responding to DFO system access service request
- Q2 DER locational static data portal launched
- Q1 published DER frequency and voltage ride-through performance requirements technical paper. Working with DFOs to adopt in DFO interconnection documents
- Potential cost savings by deferring DFO projects through applying Decision-Making Framework

Next Steps for 2021
- Pursue connection process improvements for DFO reliability and capability projects
- Develop approach to coordinate DFO capability hosting maps with AESO transmission capability assessments
- Engage in policy/regulatory related initiatives to share the AESO's principles and perspectives as it relates to mandate implications
- Facilitate DER access to AESO electricity markets by updating any ISO rules (if needed) to remove unnecessary market access limitations

2022

2022 Proposed Plan and Milestones
- Implement connection process improvements
- Implement any changes to facilitate market access for DER
- Assess/align on probabilistic planning as it applies to Transmission/Distribution planning coordination
- Implement necessary additional technical requirements for DER integration

Technology Integration

Top Priority Business Initiative

Initial proposal
- In progress

Anticipated completion
- 2024
- Technology Integration will continue to be part of ongoing base business

Objectives
- Enable timely planned integration of new technologies onto the grid and into our markets
- Enable proactive awareness of future new technologies and the potential impacts to reliability, markets and tariffs

Interdependencies
- Tariff Modernization
- Market Sustainability & Evolution
- Optimizing the Grid
- Distribution Coordination
- Red Tape Reduction
- GTA

2021

Update
- Drafting first AESO Technology Forward report
- Identifying Energy Storage (ES) rule changes and tariff treatment
- The AESO is planning first Annual Industry Technology Summit for Q4 2021
- Engaged in DOE Energy Storage policy development

Next Steps for 2021
- Publish AESO's first Technology Forward report focused on the electricity value chain and future implications to the AESO mandate
- Incorporate ES treatment in ISO tariff filing
- Finalize ES rule changes needed and prepare for filing, including changes to implement Adjustment for Load on the Margin (ALM)

2022

2022 Proposed Plan and Milestones
- Implement any ES related policy changes
- File ES related rule changes
- Publish supply technology research report
- Sustain Technology Integration processes within the AESO
- Continue implementation for ALM

Proposed: Grid Resiliency

Business Initiative (Top Priority)

Initial proposal
- Proposed new initiative for 2022

Anticipated completion
- 2022/2023

Objectives
- Enhance system frequency response
- Ensure extreme event preparedness across gas/electric interdependencies
- Identify additional reliability needs as supply transforms
- Assess need for climate adaptation plans
- Enhance cyber-security capabilities

Interdependencies
- Market Sustainability & Evolution
- Technology Integration

Business Initiative Description

- The AESO recognizes that Alberta's transmission system must be resilient and able to adapt to increasing levels of renewable generation, distributed resources, coal-to-gas conversions, electrification of the transportation system, climate change and cyber threats
- This initiative will focus on ensuring processes are in place to support the resiliency of the Alberta grid including:
  - Enhancing system frequency response
  - Ensuring extreme event preparedness across gas/electric interdependencies
  - Identifying additional reliability needs as supply transforms
  - Assessing need for climate adaptation plans
  - Enhance cyber-security capabilities

2022

2022 Proposed Plan and Milestones
- Implement system frequency response improvements including necessary rule changes
- Through senior industry committee, prepare the grid for increased reliance on natural gas for electricity production and coordinate across the gas and electric industries for potential extreme events
- Perform technical reliability needs assessment for high renewable penetrations
- Enhance cyber-security capabilities across the industry through risk-based adoption of enhanced cyber-protection standards, including CIP 013 on supply chain
- Assess climate change implications on our grid infrastructure