

The purpose of this section of the quarterly report is to provide stakeholders with an update on the Alberta Electric System Operator's (AESO) progress on the initiatives outlined in its 2020 Business Plan and Budget (Business Plan). The reader of this report should reference the Business Plan published on the AESO's website for additional information to fully understand the various progress updates provided.

Reporting on Business Plan Initiatives

Externally focused initiatives – stakeholder-participation related

Strategic Initiative – Framework Evolution			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Market sustainability & evolution	Pricing recommendation accepted by Minister; report released to AESO webpage August 28, 2020 https://www.aeso.ca/market/market-related-initiatives/market-efficiency-pricing-framework/	None	None
	AESO has completed this analysis and concluded that the cost of implementing Sub-hourly Settlement (SHS) far outweighs the benefits. Due to this AESO has made the decision not to pursue SHS at this time https://www.aeso.ca/market/market-related-initiatives/market-efficiency-sub-hourly-settlement/	The AESO will be exploring the Adjustment to Load on the Margin option identified during the SHS engagement and will update stakeholders on the next steps for engagement in 2021	To be determined
Tariff: Review of bulk and regional transmission rate design	On Nov 30, 2020, the Alberta Utilities Commission (AUC) issued Decision 25175-D02-2020 regarding the AESO's compliance with directions issued to the AESO in Decision 22942-D02-2019 regarding AESO's 2018 comprehensive ISO tariff application. In Decision 25175-D02-2020 the AUC ordered that the bulk and regional rate design application be filed by June 30, 2021 Since the resumption of stakeholder engagement since Sept 2020, 3 stakeholder sessions and 1 technical session have been held. Stakeholder engagement will continue in 2021	Continue with stakeholder engagement and file AUC application regarding Bulk & Regional Rate Design by June 30, 2021	Ongoing

Strategic Initiative – Framework Evolution			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
	https://www.aeso.ca/stakeholder-engagement/rules-standards-and-tariff/bulk-and-regional-tariff-design/		
Tariff: General Tariff Application (GTA)	<p>In Q3 2017, the AESO filed the 2018 GTA (formerly referred to as the 2017 Independent System Operator [ISO] Tariff Application) with the AUC. The AESO filed a revised 2018 GTA application in August 2018. The AUC approved the GTA with numerous directions in Oct 2019; the AESO filed the 2018 GTA compliance filing in January 2020</p> <p>On Nov 30, 2020, the AUC issued Decision 25175-D02-2020 regarding the AESO's compliance filing</p>	2018 GTA tariff effective on January 1, 2021	None
	<p>The AESO filed the 2020 tariff rates update in January 2020 with the compliance filing. AESO implementation of the 2020 tariff rate update was effective as of April 1, 2020</p> <p>On Nov 30, 2020, the AUC issued Decision 25175-D02-2020 regarding the AESO's compliance filing in which the AUC also approved the 2020 tariff rates on a final basis</p> <p>On Nov 12, 2020, the AESO filed 2021 Tariff Rates Update. On Dec 18, the AUC issued Decision 26054-D01-2020 approving the updates</p>	2021 Tariff Rates Update effective on January 1, 2021	None
Long-term system developments	Central East Transfer-out (CETO) Needs Identification Document (NID) has been finalized and was filed with the AUC on August 12, 2020. The Chapel Rock-to-Pincher Creek (CRPC) NID is currently being prepared and the decision to file this NID with the AUC has been deferred due to the state of the economy/COVID-19 concerns	To be determined	Ongoing

Strategic Initiative – Framework Evolution			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
	The decision to file the Alberta-BC Intertie Restoration (AIR) NID with the AUC has also been deferred		
Distribution Coordination	The AESO Distributed Energy Resources (DER) Roadmap was published in June 2020, with priority work focused on defining technical connection requirements and ensuring locational information is centrally available	Implement AESO DER Roadmap technical connection requirements and locational information collection. Coordinate with any AUC DER/Distribution Roadmap development	Ongoing
	Engaged in AUC Distribution System Inquiry and future policy/regulatory related initiatives to share the AESO's principles and perspectives as it relates to mandate implications	Complete Transmission/ Distribution Coordinated Planning Framework development for Distribution Facility Owner (DFO) driven transmission projects	Apply Transmission/ Distribution Coordinated Planning Framework on future DFO driven transmission projects
Stakeholder Engagement Framework	<p>The Stakeholder Engagement Framework (SEF) was finalized and posted externally in early 2020. Implementation activities required to successfully roll out and sustain the SEF have been initiated organization-wide</p> <p>Due to COVID-19, the AESO has fully transitioned to online stakeholder sessions to deliver all its engagements. The platform selected enables collaborative sessions, and will be leveraged for the foreseeable future for all engagements planned to be conducted in 2020 and early 2021 and is continuing to successfully execute on such engagements</p>	None	None

Strategic Initiative – Technology

<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Technology Integration - Energy Storage (ES)	AESO Energy Storage (ES) Roadmap has progressed with energy and ancillary services market participation information documents (IDs), the implementation of necessary system changes within the Energy Management System (EMS) and market systems to enable the current active energy storage connection projects. The Energy Storage Information Learning Forum (ESILF) was launched in May 2020 initiating the sharing of energy storage learnings across 20 industry leaders	Progress ES roadmap by addressing tariff treatment for energy storage within the ISO tariff, identifying any ISO rule changes needed to further enable integration of ES and filing changes, as required	Ongoing
Technology Integration - Technology Plan	Internal work is progressing on the technology integration plan focused on enhancing AESO awareness. External engagement on the technology plan has been deferred to 2021 due to current COVID-19 pandemic. Detailed work and change plan being developed	Complete the development of internal technology awareness and integration processes, develop external engagement plan for 2021, and draft AESO's first "Technology Forward"	Progress technology integration by implementing internal change plans, engage externally by publishing the AESO's first "Technology Forward" focused on the electricity value chain and potential future implications to the AESO mandate

Strategic Initiative – Grid and Market Operations Tools

<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Grid Market Operations (GMO) System evolution	<p>Continuing to sustain our Energy Management System (EMS) and Market tools through the execution of EMS-related projects and Critical System Modernization Initiatives</p> <p>Developing a multi-year plan for future EMS and Market related system investments</p>	Implementation of the multi-year EMS and Market related system investments will be incorporated into the capital budgeting process within the Budget Review Process (BRP) as normal business for 2021	Ongoing

AESO Internal Initiatives

Strategic Initiative – People and Culture			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Nurture an inclusive and innovative culture of engagement and excitement to prepare the organization for the transformative environment ahead	Continued implementation of the cultural evolution plan for the AESO to become a more dynamic, agile, inclusive and innovative organization, capable of anticipating and leading transformative change with a continued focus on expertise. Delivered on and completed second-year deliverables of the defined cultural evolution plan	Ongoing	Ongoing
Workforce capabilities and stakeholder education	Initiated implementation of findings from the needs assessment and knowledge management plan to support the cultural evolution and delivery of the 2019-2023 Strategic Plan Completed implementation of knowledge management plan year-one deliverables	Ongoing	Ongoing
	Initiated review and redesign of external education content and programming. Initiating defining customer experience needs and develop a plan to more effectively address these needs	Ongoing	Ongoing
Strategic Initiative – Framework Evolution			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Settlement audit	Initiated readiness assesment in preparation for settlement audit	Complete settlement audit readiness assessment of AESO settlement processes by end of Q2 2021	Audit scheduled and planned to be completed by end of 2021 or early 2022 due to continued COVID-19 delays

Strategic Initiative – Technology			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Productivity	Completed the implementation of the AESO Personal Productivity foundation increasing efficiency and positioning AESO for further advancements in future years	Ongoing	Ongoing
	Completed the initial implementation of the modernization of the finance system. Continuing the modernization of the finance system, integrated talent management system foundations and contract management system	Ongoing	Ongoing
	Commenced the modernization of the market system user experience for both internal staff and market participants	To be determined	To be determined
Cybersecurity and Critical Infrastructure Protection (CIP) optimization	Enhanced cybersecurity protections to further secure the organization against increasing threats. Implementing the CIP optimization plan	Ongoing	Ongoing

Financial Update – As of December 31, 2020

Transmission Operating Costs (\$ million)

	2020	2020	2019
	Actual	Forecast	Actual
Wires costs	1,872.1	1,916.0	1,976.1
Operating reserves	144.8	229.1	187.1
Transmission line losses	92.7	113.5	109.2
Other ancillary service costs	37.7	28.7	25.8
Total Transmission Operating Costs	2,147.3	2,287.4	2,298.2

Numbers may not add due to rounding

Wires costs – Wires costs represent the amounts paid primarily to transmission facility owners (TFOs) in accordance with their Alberta Utilities Commission (AUC)-approved tariffs and are not controllable costs of the AESO.

Wires costs in 2020 are \$1,872.1 million, which is \$104.0 million or 5.3 per cent lower than the 2019 costs of \$1,976.1 million due to adjustments related to prior production years (\$131.4 million), partially offset by higher regulated rates charged by the TFOs for the current year (\$27.4 million).

Operating reserves – Operating reserves are generating capacity or load that is held in reserve and made available to the System Controller to manage the transmission system supply-demand balance in real time. Operating reserves are procured through an online, day-ahead exchange, where offer prices are indexed to the pool price. While the prices of operating reserves procured through the online exchange are indexed to the pool price, changes to the average pool price do not result in proportional changes to the operating reserve costs; the pool price for each hour has a significant impact on the operating reserve costs for that hour.

Operating reserve costs in 2020 are \$144.8 million, which is \$42.3 million or 22.6 per cent lower than the 2019 costs of \$187.1 million. The cost of operating reserves is impacted by actual volumes, hourly pool prices and operating reserve prices. The average hourly pool price is \$47 per megawatt hour (MWh) in 2020 compared to \$55 per MWh in 2019, representing a decrease of 14.5 per cent. Operating reserve volumes financially settled in 2020 are 7,795 gigawatt hours (GWh) compared to 7,874 GWh in 2019, representing a 1.0 per cent decrease. The cost variance is mainly attributable to lower average hourly pool price, volumes and changes in offer behaviour. In addition, the implementation of optimized procurement of regulating reserves in 2020 reduced the volumes being procured and has resulted in cost savings in the active market.

Transmission line losses – Transmission line losses represent the volume of energy that is lost as a result of electrical resistance on the transmission lines. Volumes associated with line losses are determined through the energy market settlement process as the difference between generation and import volumes, less consumption and export volumes.

The hourly volumes of line losses vary based on load and export levels, generation (baseload, peaking units and imports) available to serve load, weather conditions, and changes in the transmission topology. System maintenance schedules, unexpected failures, dispatch decisions on the Alberta Interconnected Electric System (AIES), and short-term system measures (such as demand response) may also affect the volume of losses. The value of line losses is calculated based on the hourly pool price.

The cost of transmission line losses in 2020 is \$92.7 million, which is \$16.5 million or 15.1 per cent lower than the 2019 cost of \$109.2 million, mainly due to the impact of a 14.5 per cent lower average pool price in 2020. Line loss volumes financially settled in 2020 are 1,947 GWh compared to 1,874 GWh in 2019, representing a 3.9 per cent increase. Line loss volumes did not change materially from 2019 as there were no significant changes in generation dispatches due to stability in the flow of electricity on the transmission system.

Other ancillary services costs – The AESO procures other ancillary services for the secure and reliable operation of the AIES. These services are procured through a competitive procurement process where possible, or in instances where such procurement processes may not be feasible, through bilateral negotiations.

Other Ancillary Services Costs (\$ million)

	2020 Actual	2020 Forecast	2019 Actual
Load shed service for imports	28.3	20.6	16.1
Transmission must-run			
Contracted	3.0	2.4	3.0
Conscripted	0.7	0.4	0.3
Reliability services	2.9	2.9	2.9
Poplar Hill	-	1.7	0.9
Black start	2.3	2.3	2.3
Transmission constraint rebalancing	0.5	0.1	0.3
Total Other Ancillary Services	37.7	28.7	25.8

Numbers may not add due to rounding

Load shed service for imports (LSSi) is interruptible load that can be armed to trip, either automatically or manually, on the loss of the Alberta-British Columbia intertie to allow for increased import available transfer capability (ATC). The 2020 costs for LSSi are \$28.3 million, which is \$12.2 million or 75.8 per cent higher than the 2019 costs of \$16.1 million due to increased active arming costs. LSSi costs are impacted by volume availability, contract prices and AIES requirements for arming and tripping.

Transmission must-run (TMR) occurs when generation is required to mitigate the overloading of transmission lines associated with line outages, system conditions in real time or the loss of generation in an area. In circumstances when this service is required for an unforeseeable event and there is no contracted TMR, non-contracted generators may be dispatched to provide this service (referred to as conscripted TMR). Contracted TMR costs in 2020 are \$3.0 million, which is consistent with the 2019 costs of \$3.0 million. Conscripted TMR costs in 2020 are \$0.7 million, which is \$0.4 million or 133.3 per cent higher than the 2019 costs of \$0.3 million.

Reliability services are provided through an agreement with Powerex Corp. for grid restoration balancing support in the event of an Alberta blackout and emergency energy in the event of supply shortfall. The agreement came into effect on April 1, 2015.

The Poplar Hill generator provides voltage support (VArS) in addition to power (MW), to support transmission system reliability in the province. The contract with Poplar Hill was terminated in July of 2019.

Black start services are provided by generators that are able to restart their generation facility with no outside source of power. In the event of a system-wide black-out, black start services are used to re-energize the transmission system and provide start-up power to generators who cannot self-start.

Transmission constraint rebalancing costs are incurred when the transmission system is unable to deliver electricity from a generator to a given electricity-consuming area without contravening reliability requirements. When this occurs, a market participant downstream of a constraint may be dispatched for purposes of transmission constraint rebalancing under the Independent System Operator (ISO) Rules and would receive a transmission constraint rebalancing payment for energy provided for that purpose. Transmission constraint rebalancing came into effect on November 26, 2015. There was \$0.5 million in transmission constraint rebalancing costs in 2020, which is \$0.2 million or 66.7 per cent higher than the 2019 costs of \$0.3 million.

Other Industry Costs (\$ million)

	2020 Actual	2020 Budget	2019 Actual
Alberta Utilities Commission (AUC) fee – Transmission	10.8	12.0	11.5
AUC fee – Energy Market	7.2	6.4	7.9
WECC/NWPP/NERC costs	2.5	2.8	2.2
Regulatory process costs	2.2	3.3	6.1
Total Other Industry Costs	22.7	24.5	27.7

Numbers may not add due to rounding

Other industry costs represent fees or costs paid based on regulatory requirements or membership fees for industry organizations, which are not under the direct control of the AESO. These costs relate to the annual administration fee for the AUC, the AESO's share of Western Electricity Coordinating Council (WECC), Northwest Power Pool (NWPP) and North American Electric Reliability Corporation membership (NERC) fees and regulatory process costs. Regulatory process costs are associated with the AESO's involvement in an AUC proceeding to hear objections and complaints to ISO Rules or a regulatory application and costs incurred to respond to specific agency-related directions or recommendations that are beyond the routine operations of the AESO; this does not include application preparation costs.

Other industry costs in 2020 are \$22.7 million, which is \$5.0 million or 18.1 per cent lower than 2019 costs of \$27.7 million. The decrease is mainly attributable to decreased regulatory process costs in 2020.

General and Administrative Costs (\$ million)

	2020 Actual	2020 Budget	2019 Actual
Staff costs	65.7	66.7	77.7
Contract services and consultants	3.7	7.4	5.5
Facilities	4.1	4.3	3.9
Administration	3.2	4.8	4.3
Computer services and maintenance	10.2	11.6	11.5
Telecommunications	1.4	1.5	1.5
Total General and Administrative Costs	88.3	96.2	104.4

Numbers may not add due to rounding

In 2020, staff costs are \$65.7 million, which is \$12.0 million or 15.4 per cent lower than the 2019 costs of \$77.7 million. The decrease is associated with organizational restructuring in the latter half of 2019 following the decisions by the Government of Alberta that the province would not transition to a capacity market or proceed with additional competition rounds under the Renewable Electricity Program (REP). In addition, employee benefit costs were impacted by lower claims during 2020 being made by employees.

In 2020, contract services and consultant costs are \$3.7 million, which is \$1.8 million or 32.7 per cent lower than the 2019 costs of \$5.5 million. The decrease is due to the conversion of consultants to staff positions throughout 2019; the cessation of REP procurement and capacity market initiatives; internal cost saving initiatives; and the timing of activities requiring consulting services being delayed given the unexpected impact of COVID-19.

Interest and Amortization (\$ million)

	2020	2020	2019
	Actual	Budget	Actual
Amortization of right-of-use assets, intangible assets and depreciation of property, plant and equipment	30.7	22.1	38.8
Interest	37.8	7.1	5.4

In 2020, amortization of intangible assets and depreciation of right-of-use assets and PP&E collectively total \$30.7 million, which is \$8.1 million or 20.9 per cent lower than the 2019 amortization of \$38.8 million. The decrease is primarily due to the impact of the write-off of \$10.7 million in capacity market assets in 2019 that no longer held future value for the AESO following the July 24, 2019 announcement by the Government of Alberta that the province will not transition to a capacity market and will continue with an energy-only market.

Interest costs in 2020 are \$37.8 million, which is \$32.4 million or 600.0 per cent higher than the 2019 costs of \$5.4 million. The increase is due to the settlement of adjustments to historical loss factor charges. During 2020, following a decision by the AUC (AUC Decision 790), the AESO began the settlement of adjustments in respect of the recalculation of historical loss factor charges. The AUC decision directed the AESO to modify the methodology used to calculate loss factor charges for the period from January 1, 2006 to December 31, 2016. In accordance with the decision, interest was calculated from the time of original settlement until final settlement for any amount due to and from the AESO. Accordingly, interest expense of \$33.6 million was recognized, which is offset by interest income of \$33.7 million in the AESO's Statement of Income and Comprehensive Income.

Capital Expenditure Update – As of December 31, 2020

Capital Program (\$ million)							
	Total Project Approved	Prior Year(s) Actual	Spent in 2020 to-date	ETC in 2020	ETC Future Yr.(s)	Total Cost Est.	Variance Approved to Total Cost Est.
Key Capital Initiatives							
EMS Sustainment	13.9	6.1	5.0	-	2.4	13.5	0.4
CIP	0.5	0.0	0.3	-	0.1	0.4	0.1
Critical Systems External Interface Modernization	1.2	0.2	0.9	-	0.0	1.2	0.0
Cyber and Physical Security Advancements	1.2	-	1.0	-	0.0	1.0	0.2
Market Evolution - Other	0.8	0.5	0.2	-	0.1	0.8	0.0
Personal Productivity	4.8	0.9	3.2	-	0.3	4.4	0.4
Other Capital Initiatives	17.4	1.8	7.8	-	5.6	15.2	2.2
Life Cycle Funding	6.9	1.4	4.7	-	0.3	6.5	0.4
General / Total Capital	46.7	11.0	23.2	-	8.8	43.0	3.7

Numbers may not add due to rounding

General Capital Program (\$ million)	
Spent to December 31, 2020	23.2
General Capital approved	29.3
Variance (spent versus approved for 2020)	6.1

Appendix I - Notes

The following tables provide information on the AESO’s capital progress for 2020.

Key Capital Initiatives

These are the most critical capital projects over the planning period that the AESO believes must be completed within the identified timeframe.

Key Capital Initiatives		
Energy Management System (EMS) Sustainment	Description	The EMS is used by System Controllers in grid operations to monitor, control and optimize the performance of the power system. Upgrades relating to the sustainment and optimization requirements of the EMS evergreen strategy includes vendor software upgrades and improved analysis and reporting capabilities
	2020 Progress	Adding an Enhancement and System Evolution approach to the sustainment of the Grid and Market Operation (GMO) tools to determine a holistic investment approach to 2020 – 2025 timeframe Consolidating existing and future programs based on the above approach under the appropriate governance model to deliver a sustainable EMS investment plan and develop a long-term market tools transition plan supporting future energy and Ancillary Services AS market plans
Cyber and Physical Security Advancements	Description	Enhance cybersecurity protections to further secure the organization against increasing threats
	2020 Progress	Implementation of various cybersecurity-related projects and programs including Wi-Fi access, network upgrades, consolidated network monitoring, network access control and identity and access management
Critical Infrastructure Protection (CIP)	Description	Optimize the AESO CIP program and comply with the new CIP-014 Physical Security standard
	2020 Progress	Implementation of various CIP-related projects and programs including robotic process automation, optimization, service management, management of logging, monitoring and configuration
Market Evolution – Other	Description	The identification, development and implementation of tools in support of market optimization and/or performance improvements and required market changes

Key Capital Initiatives		
	2020 Progress	Design and implementation related to market evolution, including: Alberta Load Forecast (ALF) Software Replacement Implementation; Wind and Solar Forecasting Implementation and the Long Term Load Forecast (LTFT) Modernization Implementation
Productivity Applications and Tools	Description	Complete implementation of the AESO Personal Productivity foundation to increase efficiency and position AESO for further advancements in future years
	2020 Progress	Implemented the Windows 10 & Office Suite upgrade and mobile device program as well as various other Personal Productivity enhancements relating to cloud, email and collaboration technology
Critical Systems External Interface Modernization	Description	Energy Trading System (ETS) web framework replacement and modernization of market system user experience for both internal staff and market participants
	2020 Progress	Completed implementation of the ETS web framework replacement and initiate implementation of the market systems interface modernization