

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	Draft recommendation presented to stakeholders, feedback reviewed and recommendation finalized. Recommendation Report submitted to Minister by July 31, 2020	None	None
	Sub-hourly settlement project and stakeholder engagement progressing as per schedule	Present sub-hourly settlement market benefits and costs to stakeholders with draft recommendation on the path forward in September 2020	To be determined
Tariff: Review of bulk and regional transmission rate design	In Q2 2018, the AESO proposed to the Alberta Utilities Commission (AUC) that a consultation process be initiated to review bulk and regional transmission rate design; the AUC approved the proposal, and the AESO initiated the consultation process in Q3 2018. Progress was accelerating in 2020, however engagement has been paused due to COVID-19 as industry participants need to focus on core businesses	Information on the timing of reinitiating engagement on the bulk and regional rate design submitted to the AUC July 27, 2020	Ongoing

Strategic Initiative – Framework Evolution			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Tariff: General Tariff Application (GTA)	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	Ongoing proceeding process for compliance approval underway	Expected AUC approval for the 2018 GTA compliance filing in Q3 2020
	The AESO filed the 2020 tariff rates update in January 2020 with the compliance filing. The AUC approved the rates on an interim basis with a Q2 2020 implementation. AESO implementation of the 2020 tariff rate update, effective as of April 1, 2020	None	None
Long-term system developments	<p>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 has been deferred due to the state of the economy/COVID-19 concerns</p> <p>The decision to file the Alberta-BC Intertie Restoration (AIR) NID has also been deferred for the time being</p>	To be determined	Ongoing
Distribution Coordination	The AESO Distributed Energy Resources (DER) Roadmap was published in June, 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

Strategic Initiative – Framework Evolution			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
	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 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 of 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 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	<p>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</p>	<p>Complete the development of internal technology awareness and integration processes, develop external engagement plan for 2021, and draft AESO’s first “Technology Forward”.</p>	<p>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</p>
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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 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>	<p>Implementation of the multi-year EMS and Market related system investments will be incorporated into the capital budgeting process within the BRP as normal business for 2021</p>	<p>Ongoing</p>

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. Delivering on second-year deliverables of the defined cultural evolution plan	Complete implementation of second-year deliverables of the defined cultural evolution plan by Q4 2020	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	Complete implementation of knowledge management plan year-one deliverables by Q4 2020	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	Complete review and redesign of external education program content. Complete plan and delivery of the 2020 education content as per the defined schedule	Ongoing

Strategic Initiative – Framework Evolution			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Settlement audit	Initiated readiness assessment in preparation for settlement audit	Complete settlement audit readiness assessment of AESO settlement processes by end of 2020	Audit scheduled to be completed in 2021 due to COVID-19

Strategic Initiative – Technology			
<i>Business Initiative</i>	<i>Current Status</i>	<i>Next Milestone</i>	<i>Target</i>
Productivity	Continuing implementation of the AESO personal productivity foundation	Complete implementation of the AESO personal productivity foundation, by Q4 2020, to increase efficiency and position AESO for further advancements in future years	Ongoing
	Continuing the modernization of the finance system, integrated talent management system foundations and contract management system	Complete the initial implementation of the modernization of the finance system, integrated talent management system and the contract management system, by Q4 2020	Ongoing
	Commenced the modernization of market system user experience for both internal staff and market participants	To be determined	To be determined
Cybersecurity and Critical Infrastructure Protection (CIP) optimization	Enhance cybersecurity protections to further secure the organization against increasing threats. Implementing the CIP optimization plan	Continue implementing cybersecurity controls and CIP optimization plan according to the 2020 strategic plan	Complete implementation of 2020 items from cybersecurity plan and the CIP optimization plan. Update cybersecurity strategic plan

Financial Update – As of June 30, 2020

Transmission Operating Costs (\$ million)			
	2020	2020	2019
	Actual	Forecast	Actual
Wires costs	961.8	958.0	922.0
Operating reserves	92.0	89.7	120.5
Transmission line losses	44.7	47.6	65.6
Other ancillary service costs	16.0	14.4	14.8
Total Transmission Operating Costs	1,114.5	1,109.7	1,123.1

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 \$961.8 million, which is \$39.8 million or 4.3 per cent higher than the 2019 costs of \$922.0 million due to higher regulated rates charged by the TFOs for the current year and completion of the Fort McMurray West 50kV Transmission Project, which was energized on March 28, 2019.

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 \$92.0 million, which is \$28.5 million or 23.7 per cent lower than the 2019 costs of \$120.5 million. The cost of operating reserves is impacted by actual volumes, hourly pool prices and operating reserve prices. The average hourly pool price is \$48 per megawatt hour (MWh) in 2020 compared to \$63 per MWh for the same period in 2019, representing a decrease of 23.8 per cent. Operating reserve volumes financially settled in 2020 are 4,058 gigawatt hours (GWh) compared to 4,065 GWh in 2019, representing less than a 1.0 per cent decrease.

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 \$44.7 million, which is \$20.9 million or 31.9 per cent lower than the 2019 cost of \$65.6 million due to the impact of a 23.8 per cent lower average pool price in 2020 combined with lower volumes. Line loss volumes financially settled in 2020 are 939 GWh compared to 992 GWh in 2019, representing a 5.3 per cent decrease.

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	2020	2019
	Actual	Forecast	Actual
Load shed service for imports	11.5	10.3	9.5
Transmission must-run			
Contracted	1.8	1.2	1.7
Conscripted	0.1	0.2	0.1
Reliability services	1.4	1.4	1.4
Poplar Hill	0.0	0.0	0.7
Black Start	1.1	1.2	1.1
Transmission constraint rebalancing	0.0	0.0	0.3
Total Other Ancillary Services	16.0	14.4	14.8

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). LSSi costs are impacted by volume availability, contract prices and AIES requirements for arming and tripping. The 2020 costs for LSSi are \$11.5 million, which is \$2.0 million or 21.1 per cent higher than the 2019 costs of \$9.5 million due to increased active arming costs.

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.

The AESO contracts with a generator in Northwest Alberta to provide TMR services which cost \$1.8 million in 2020 and \$1.2 million in 2019. 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). Conscripted TMR services cost \$0.1 million in 2020 and \$0.2 million in 2019.

Reliability services are procured for grid restoration balancing support in the event of an Alberta blackout and emergency energy in the event of supply shortfall.

The Poplar Hill generator provided voltage support (VARs) in addition to power (MW), to support the transmission system reliability in the Northwest part of the province. The contract with Poplar Hill was terminated in July 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. Black start providers are required in specific areas of the AIES to ensure the entire system has adequate start-up power.

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.

Other Industry Costs (\$ million)			
	2020	2020	2019
	Actual	Budget	Actual
Alberta Utilities Commission (AUC) fee – Transmission	3.9	6.0	5.8
AUC fee – Energy Market	2.5	3.2	3.8
WECC/NWPP/NERC costs	1.2	1.4	1.1
Regulatory process costs	1.1	1.7	3.1
Total Other Industry Costs	8.7	12.3	13.7

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 (NERC) membership 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 \$8.7 million, which is \$5.0 million or 36.5 per cent lower than 2019 costs of \$13.7 million. The decrease is mainly attributable to regulatory process costs as 2019 included costs related to the AUC's review and approval of rules to launch a capacity market and related cost orders. In addition, AUC fees for transmission were \$1.9 million lower than 2019 actuals and \$2.1 million lower than budgeted expectations.

General and Administrative Costs (\$ million)

	2020 Actual	2020 Budget	2019 Actual
Staff costs	34.0	33.3	38.2
Contract services and consultants	1.5	3.7	2.9
Facilities	2.0	2.1	1.9
Administration	1.6	2.4	2.2
Computer services and maintenance	5.1	5.8	5.6
Telecommunications	0.7	0.8	0.8
Total General and Administrative Costs	44.9	48.1	51.6

Numbers may not add due to rounding

In 2020, staff costs are \$34.0 million, which is \$4.2 million or 11.0 per cent lower than the 2019 costs of \$38.2 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 2020, contract services and consultants are \$1.5 million, which is \$1.4 million or 48.3 per cent lower than the 2019 costs of \$2.9 million. The decrease is due to the conversion of consultants to staff positions throughout 2019, as well as cessation of REP procurement and capacity market initiatives. Actual 2020 costs are lower than budgeted expectations due to the timing of activities and initiatives requiring consulting services.

Interest and Amortization (\$ million)

	2020 Actual	2020 Budget	2019 Actual
Amortization of right-of-use assets, intangible assets and depreciation of property, plant and equipment	14.8	11.1	12.0
Interest	2.3	3.5	2.3

In 2020, amortization of right-of-use assets, intangible assets and depreciation of property, plant and equipment collectively total \$14.8 million, which is \$2.8 million or 23.3 per cent higher than the 2019 amortization of \$12.0 million. The increase is primarily due to the change to the asset base being amortized and depreciated year-over year, as well as a change in estimated life of computer software that resulted in an increase to amortization.

Interest costs in 2020 are \$2.3 million, which is consistent with 2019 costs.

Capital Expenditure Update – As of June 30, 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	11.6	5.9	1.7	2.5	1.6	11.7	-0.1
CIP	0.5	0.0	0.1	0.2	0.0	0.4	0.1
Critical Systems External Interface Modernization	1.0	0.2	0.5	0.4	-	1.2	-0.2
Cyber and Physical Security Advancements	1.1	-	0.4	0.6	-	0.9	0.2
Market Evolution - Other	0.6	0.5	0.1	-	-	0.6	0.0
Personal Productivity	4.7	0.9	1.6	1.9	0.2	4.7	0.0
Other Capital Initiatives	15.5	1.8	3.6	6.7	2.0	14.1	1.4
Life Cycle Funding	6.5	1.4	2.0	2.0	-	5.4	1.0
General / Total Capital	41.5	10.8	10.0	14.2	3.9	39.0	2.5

Numbers may not add due to rounding

General Capital Program (\$ million)	
<u>Spent to June 30, 2020</u>	10.0
Estimate to Complete (ETC) in 2020	14.2
Subtotal	24.2
General Capital approved	29.3
2020 budget remaining (variance)	5.1

Appendix I - Notes

The following tables provide information on the AESO's capital plan 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 Plan	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 AS market plans
Cyber and Physical Security Advancements	Description	Enhance cybersecurity protections to further secure the organization against increasing threats
	2020 Plan	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 Plan	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
	2020 Plan	Design and implementation related to market evolution, including: Alberta Load Forecast (ALF) Software Replacement Implementation; Wind and Solar Forecasting Implementation and

Key Capital Initiatives		
		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 Plan	Implement 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 Plan	Complete implementation of the ETS web framework replacement and initiate implementation of the market systems interface modernization