AESO 2020
Business Plan and Budget Proposal

Memo

To: AESO Board
From: Vice-President, Finance and Chief Financial Officer
Date: Wednesday, January 15, 2020
Subject: **AESO 2020 Business Plan and Budget Proposal**

Enclosed is the AESO 2020 Business Plan and Budget Proposal (Business Plan). This document was prepared by AESO Management in consultation with stakeholders and outlines:

- The process employed to develop the Business Plan;
- The AESO's proposed 2020 business initiatives;
- The proposed 2020 budgets/forecasts for:
  - wires costs;
  - transmission line losses costs;
  - ancillary services costs;
  - other industry costs;
  - general and administrative and interest costs and amortization; and
  - capital costs.

AESO Management will be requesting at the February 2020 AESO Board meeting that the AESO Board approve, or amend and approve, as appropriate, the items outlined in Section 1 of this document. Prior to the meeting, stakeholders may request the opportunity to meet with you to discuss their written comments related to the information provided. As you are aware, these meetings are scheduled for Monday February 10, 2020.

Should you have any questions or additional information requirements please let me know.

Yours truly,

Todd Fior

Vice-President, Finance and Chief Financial Officer

cc: Mike Law, President and Chief Executive Officer
Nicole Kinch, Director, Accounting & Treasury
Karen Campbell, Director, Settlement, Credit & Business Planning
Interested Stakeholders

Alberta Electric System Operator
Calgary Place, 2500, 330-5th Avenue SW Calgary, AB T2P 0L4
Phone: 403-539-2450 | Fax: 403-539-2949
www.aeso.ca
@theaeso

Table of Contents

Board Decision Items – Executive Summary

Over the last several months, we have reviewed and discussed with stakeholders and the AESO Board, our proposed business initiatives for 2020 which indicate our planned direction and the focus of our operations in the upcoming year. The business initiatives being proposed and our day-to-day operational activities form the foundation from which we have developed our 2020 budgeted costs (general and administrative, interest, amortization, capital and other industry costs). This *AESO 2020 Business Plan and Budget Proposal* (Business Plan) provides an overview of our proposed business initiatives and business activities that will enable us to meet our mandate[1] and advance our *2019 – 2023 Strategic Plan*.

Our budgeted costs are based on the funding we require to achieve our business initiatives and maintain our business operations as outlined in the Business Plan. In addition to this, we are also providing transmission line losses and ancillary services cost forecasts for 2020 which are within the AESO Board's mandate for approval. These forecasts have been developed internally and have been included in the process to engage stakeholders for review and comment, consistent with our budgeted costs.

We have openly engaged stakeholders interested in reviewing our proposed initiatives, budgets and forecasts and in return stakeholders have provided us with their comments as we worked through this process. This consultation process, referred to as the Budget Review Process (BRP), allows us to prepare a business plan and budget that has been reviewed and discussed. As a part of this proposal to the AESO Board, we are providing the stakeholder written comments we have received to date and our responses to those comments. The purpose of providing these comments and responses is for the AESO Board to gain insight into some of the areas that created discussion throughout this process. We continue to believe that this open and transparent process enables us to prepare a thorough and comprehensive Business Plan, and we believe our stakeholders continue to appreciate this inclusive process. The end result is a well communicated and understood Business Plan that will provide us direction in the coming year. The following are the approvals that we will be requesting from the AESO Board.

[1] The Alberta Electric System Operator (AESO) is responsible for the safe, reliable and economic planning and operation of the Alberta interconnected electric system (AIES) and the facilitation of a fair, efficient and openly competitive electricity market.

AESO Board is requested to:

1. Endorse the 2020 business initiatives as outlined in the Business Plan.

2. Approve the following proposed 2020 budget and forecast amounts as outlined in the Business Plan and summarized as follows:

	Budget Category/Year		Page Reference[2]	Revenue Source ($ million)				
				Trans-mission	Energy Market	Renew-ables	Load Settlem-ent	Total
OWN COSTS	General and Administrative	2020	19	63.7	30.9	1.0	0.6	96.2
	Interest	2020	20	3.0	3.3	0.7	0.1	7.1
	Amortization	2020	20	15.9	5.7	0.4	0.1	22.1
	Capital	2020	23					29.3
	Other Industry Costs	2020	15	16.5	8.1	-	-	24.5
TRANSMISSION OPERATING COSTS	Wires	2020	12	1,916.0	-	-	-	1,916.0
	Transmission Line Losses	2020	12	113.5	-	-	-	113.5
	Ancillary Services	2020	12	257.8	-	-	-	257.8
SUMMARY	Own Costs	2020		82.5	39.9	2.1	0.9	125.4
	Transmission Operating Costs	2020		2,287.4	-	-	-	2,287.4

Differences are due to rounding

[2] Details provided on the referenced pages in Section 4 of the Proposal

Section 2

Stakeholder Presentations to the AESO Board

Stakeholder presentations to the AESO Board to be inserted when received

Stakeholder Consultation Undertaken

The *Transmission Regulation*[1] (T-Reg) includes provisions addressing the approval of the AESO's own costs, transmission line losses costs and ancillary services costs. The T-Reg provides that the AESO must consult with stakeholders with respect to the proposed costs to be approved by the AESO Board. It also provides that these costs, once approved by the AESO Board, must be considered by the Alberta Utilities Commission (AUC) as 'prudent' unless interested persons satisfy the AUC otherwise.

The practice that has been established to carry out this consultation is the Budget Review Process (BRP). The BRP is a transparent process which provides a level of prudence review with input from stakeholders. At the conclusion of the BRP, AESO Management makes a recommendation with respect to own costs (general and administrative, interest, amortization, capital and other industry costs), wires, transmission line losses costs and ancillary services costs to the AESO Board for approval.

The BRP overview, terms of reference and a calendar providing the BRP milestone activities leading up to an AESO Board decision (the calendar was revised during the process to accommodate process changes and schedules) has been posted on the AESO's website. These documents have been included as Appendices A to C to this Section. At a high level, the BRP steps followed are:

- AESO Issues Notices to Stakeholders
- AESO Develops Business Initiatives
- AESO Develops Own Costs Budget and Ancillary Services and Transmission Line Losses Cost Forecasts
- AESO Reviews Business Initiatives with Stakeholders
- AESO Reviews Own Costs Budget, Ancillary Services and Transmission Line Losses Costs Forecasts with Stakeholders
- AESO Board Decision Is Made

As with prior years' BRP, the process has been open to all stakeholders and the process has been transparent as all presentation materials, stakeholder comments (if any) and the AESO's responses have been posted on the AESO's website. Through this process, all stakeholders have had an opportunity to provide input. The BRP will be re-evaluated with stakeholders at its conclusion and refinements made to the process going forward as required.

[1] A/R 86/2007

Appendix A –

Terms of Reference for Budget Review Process (BRP)

Monday, September 30, 2019

Re: Budget Review Process (BRP) 'Terms of Reference'

Transparency is the overarching principle in the BRP. The following will help ensure transparency to stakeholders during this process.

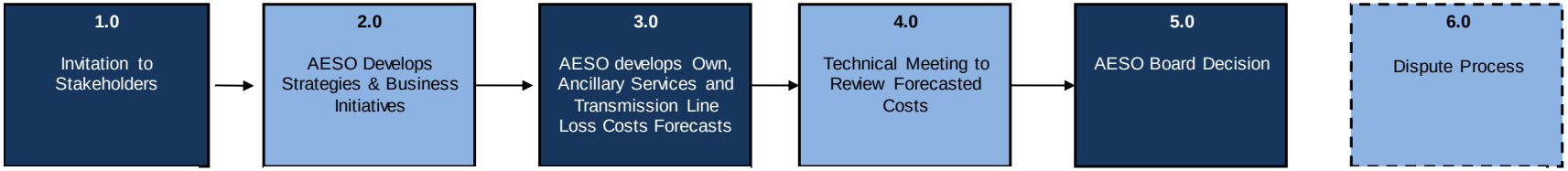
- The process should be open to all stakeholders that are interested.
- The size of the group should not be limited.
- Stakeholders are encouraged to register as participants at the outset of each year's process in order to ensure a consistent understanding and to minimize inefficiencies.
- During stakeholder meetings, verbal comments are encouraged as they provide valuable input for general discussion and consideration.
- Written comments will be responded to by the AESO and shared with all stakeholders (i.e., posted to AESO website). As well, stakeholders will have the opportunity to comment on each other's comments.
- Written comment submissions are a requisite during the technical consultation period in order to be entitled to present to the AESO Board on the same comments.
- The written decision rendered by the AESO Board on these matters will contain reasons / rationale.
- Throughout the process, the AESO will endeavor to provide as much information as is reasonably possible to ensure stakeholders have all information relevant to the subject matters under review. However, the AESO and stakeholders will need to agree on the level of detail to discuss (including confidential information), on an issue by issue basis, in an effort to be most effective and efficient.
- At the end of each AESO budget process review cycle, the AESO and stakeholders will evaluate the effectiveness of the process and make appropriate changes if required for the following year.

In Addition:

- Everyone is able to present their views.
- Everyone must work within the timeline agreed upon at the start of the process.
- This process is not a negotiated settlement.
- The material to be delivered to the AESO Board in order to prepare a decision does not have to be agreed upon unanimously.
- Information will be provided to all stakeholders in a timely manner.
- Stakeholders will have a reasonable time period to review and respond to AESO material
- Nothing will preclude the opportunity for stakeholders to ultimately appeal any decision using the dispute mechanism outlined in the ISO Rules.

Appendix B –

Budget Review Process



- Notice sent to all stakeholders that the process to develop and review forecasted costs will commence
- Process includes developing a schedule with all milestone dates
- AESO posts invitation and supporting documents to AESO website and asks for written comments
- AESO makes revisions as deemed necessary

- AESO to solicit stakeholder input on strategies and business initiatives
- Review progress on existing strategies and business initiatives with stakeholders
- Stakeholders receive AESO strategies and business initiatives for the upcoming budget period
- AESO posts meeting overview document to AESO website and asks for written comments
- AESO makes revisions as deemed necessary

- AESO prepares Own Cost forecast for the upcoming budget period based on the business initiatives and strategic plan set out in Step 2.0
- AESO prepares forecasts of Ancillary Services and Transmission Line Loss Costs
- AESO provides documents to stakeholders in advance of holding a technical review meeting

- AESO holds technical session with stakeholders where the AESO presents forecasted costs, assumptions and responds to stakeholder comments
- AESO posts meeting overview document to AESO website and asks for written comments
- AESO makes revisions as deemed necessary
- AESO prepares an AESO Board Decision Document and provides to stakeholders for review prior to submission to the AESO Board
- AESO submits Board Decision Document to the AESO Board for review and decision

- AESO Board reviews Board Decision Document
- Stakeholders make oral or written presentations to the AESO Board on issues of disagreement or concern (multi-lateral) based on comments submitted in one of the earlier steps
- AESO Board considers stakeholder presentations and reply comments in its approval process
- AESO Board issues a decision for AESO's Own, Ancillary Services and Transmission Line Loss Cost forecasts with rationale

- Dispute resolution mechanism for instances where a stakeholder disagrees with the AESO Board Decision
- The Dispute Resolution process is outlined in the ISO Rules

Appendix C –

2020 Budget Review Process Schedule – Occuring in 2019 & 2020 (Tentative Dates)

Materials Distributed

Stakeholder Meetings

Stakeholder Comments Received

AESO Posts Comments, Replies, Business Plan & Budget and AESO Board Decision

AESO Board Meeting

	SEPTEMBER						*OCTOBER*					*NOVEMBER*			
Mon	**Tues**	**Wed**	**Thurs**	**Fri**	**Mon**	**Tues**	**Wed**	**Thurs**	**Fri**	**Mon**	**Tues**	**Wed**	**Thurs**	**Fri**
2	3	4	5	6		1	2	3	4					1
Holiday														
9	10	11	12	13	7	8	9	10	11	4	5	6	7	8
						Receive Stakeholder comments on Invitation and Process Materials (Step 1)								
16	17	18	19	20	14	15	16	17	18	11	12	13	14	15
					Holiday		AESO web posting of comments and replies on Invitation and Process Materials (Step 1)			Receive Stakeholder comments on Business Strategies / Initiatives (Step 2)				
23	24	25	26	27	21	22	23	24	25	18	19	20	21	22
														AESO web posting of comments and replies on Business Initiatives (Step 2)
30					28	29	30	31		25	26	27	28	29
Invitation and Process Materials to Stakeholders (Step 1)							Business Initiatives Meeting (Step 2)							Tech. Meeting (Forecasts and Own Costs) Calgary (Step 4)

		DECEMBER						JANUARY					FEBRUARY			
Mon	Tues	Wed	Thurs	Fri		Mon	Tues	Wed	Thurs	Fri	Mon	Tues	Wed	Thurs	Fri
2	3	4	5	6				1	2	3					
								Holiday							
9	10	11	12	13		6	7	8	9	10	3	4	5	6	7
				Receive Stakeholder comments on Forecasts and Own Costs (Step 4)							Receive Stakeholder written submissions for AESO Board (Step 5)				
16	17	18	19	20		13	14	15	16	17	10	11	12	13	14
								Web Posting of 2020 Business Plan and Budget Proposal	Web posting of comments and replies on Forecasts and Own Costs (Step 4)		AESO Board Meeting w/ Stakeholders Oral Presentation to AESO Board (Committee) (Step 5)				
23	24	25	26	27		20	21	22	23	24	17	18	19	20	21
		Holiday	Holiday												
30	31					27	28	29	30	31	24	25	26	27	28

Section 4

AESO 2020 Business Plan and Budget Proposal

The information contained in this document is published in accordance with the AESO's legislative obligations and is for information purposes only. As such, the AESO makes no warranties or representations as to the accuracy, completeness or fitness for any particular purpose with respect to the information contained herein, whether expressed or implied. While the AESO has made every attempt to ensure the information contained herein is timely and accurate, the AESO is not responsible for any errors or omissions. Consequently, any reliance placed on the information contained herein is at the reader's sole risk.

Table of Contents

2020 Business Plan

The AESO's *2020 Business Plan and Budget Proposal* (Proposal) provides an overview of the business initiatives and expenditures the AESO proposes for the forthcoming year. It also charts the AESO's organizational approach to the objectives outlined within the *Alberta Electric System Operator 2019–2023 Strategic Plan.*

The strategic plan establishes our objectives for the next five years, and this business plan and budget outlines the specific tasks we will focus on in 2020 to meet those objectives. The strategic plan and its associated Strategic Execution Initiatives provide a path to delivery that will allow the AESO and the Industry to be well positioned to manage the transformative change environment that the power industry is undergoing worldwide. Shifting generation technologies, distributed resources, changing consumer preferences and optionality expectations are driving fundamental change. The AESO must be positioned to ensure that new technologies and consumer requirements are reliably integrated into the power system, and that the AESO and industry framework are not barriers to progress, development or investment. Some initiatives will be completed in 2020; others will require more than one year to be completed. The Business Plan provides transparency as to which initiatives we will focus on in 2020.

Over the past few years, significant change has occurred in the provincial economy, the electricity industry and also within the AESO. In 2020 the AESO will need to deliver on a number of major initiatives on behalf of the Government of Alberta, including the Energy only Market review, Transmission system developments, distribution initiatives and tariff requirements. Our comprehensive understanding of electricity in Alberta, in-depth expertise, strong leadership and focus will be instrumental to our success.

In early 2017, the AESO began the design and implementation of a new electricity framework that included a revised energy market and a capacity market. The first delivery of capacity was expected to occur in 2021. However, on July 24, 2019, the Government of Alberta announced that Alberta will not transition to a capacity market and will continue with an energy-only market.

The AESO was directed by the Government of Alberta to provide advice by July 31, 2020 on whether changes are needed to the energy-only market, including changes to the price floor/ceiling and shortage pricing. The market initiatives are outlined in this Business Plan and on December 19, 2019 the AESO provided stakeholders with additional details with an overview of the market related initiatives planned by the AESO for 2020.

In addition, the AESO was directed by the Government of Alberta to provide advice on market power and market power mitigation for the ancillary services and energy-only markets by November 29, 2019. The information was provided to the Minister of Energy in accordance with the required timeline.

In 2020, the AESO will be focused on the delivery of the directions as requested by the Government of Alberta and as outlined in the overview of market-related initiatives provided to stakeholders on December 19, 2019. In addition, the AESO will be focusing on the following initiatives in 2020:

- continue comprehensive consultation process of bulk and regional transmission rate design with an application to be filed with the Alberta Utilities Commission (AUC);
- implement the 2018 ISO Tariff decision;
- obtain AUC approval of system projects that benefit Albertans;
- continue implementation of Distributed Energy Resources Roadmap;
- finalize stakeholder engagement framework and operationalize the framework;
- advance technology plan for integration of new electricity value chain technologies; and
- deliver a sustainable Energy Management System (EMS) investment plan and develop a long-term market tool transition plan.

The AESO continues to focus on efficiently and effectively delivering on its activities that create value for stakeholders and the province as a whole. The AESO's proposed 2020 general and administrative budget is $96.2 million which is $9.8 million (or 9.2 per cent) lower than the 2019 budget of $106.0[1] million. The decrease is a result of reduced resources, staff and consulting, as a result of the capacity market and Renewable Electricity Program not continuing past 2019. The current Budget levels are in line with expenditure levels from 2014 – 2015, however they have absorbed significant cost escalation in the area of CIP and Cyber programs, general IT cost increases, an expanded System Coordination Centre (SCC) facility, commercial management costs associated with the Fort McMurray West Transmission line and ongoing Renewable Electricity Program costs, EMS costs increases and general inflationary drivers.

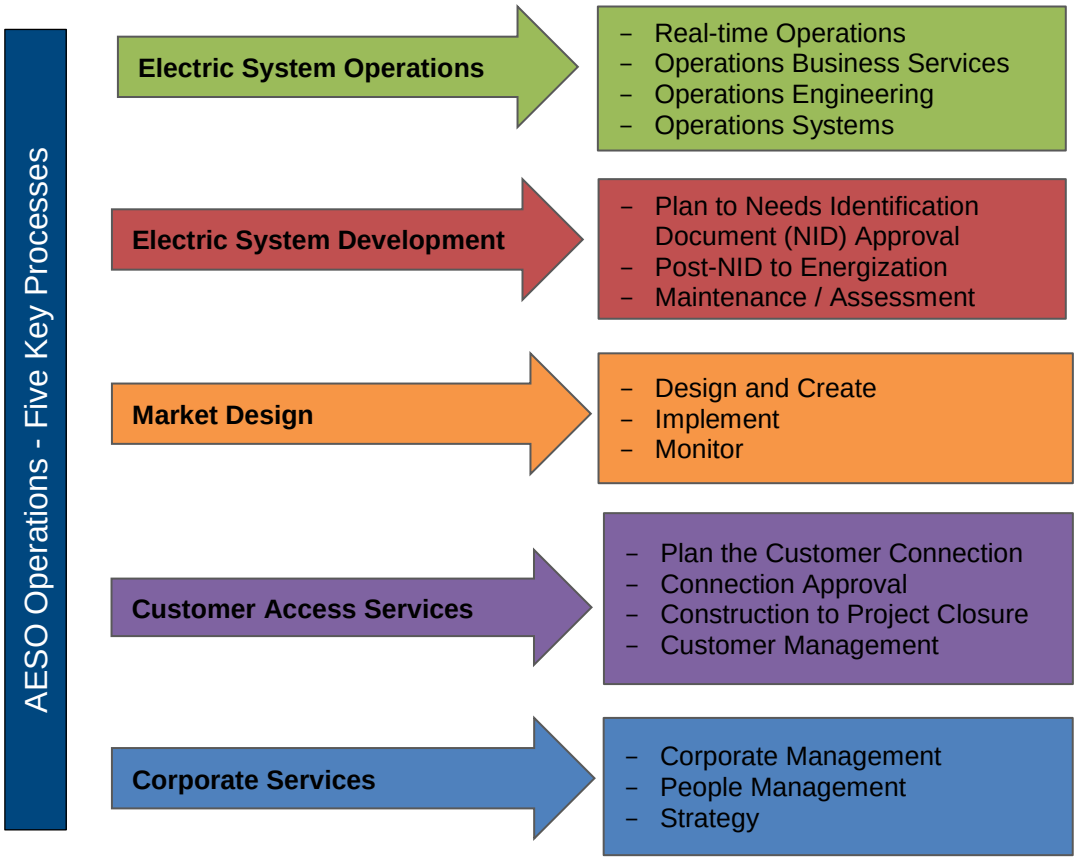
The 2020 proposed capital budget is $29.3 million, reflecting a decrease in the capital budget required for key projects in 2020; $49.4 million was budgeted for in 2019. The decrease is primarily a result of the capacity market tools no longer being developed and implemented as well as the completion of the AESO's SCC Expansion project in late 2019.

By performing the work defined within this Proposal, the AESO will continue to demonstrate that Albertans can look to it for electricity industry leadership, and that they can be confident the transmission system and electricity framework are managed efficiently and reliably, every day.

[1] The 2019 general and administrative budget amount originally approved by the AESO Board was $109.7 million. The approved amount has been amended to $106.0 million to reflect new accounting requirements for leases as required by International Financial Reporting Standards (IFRS).

AESO Operations

The AESO's operations are described using five key processes which allow for a more detailed understanding of the AESO's activities and organizational awareness to ensure the operations are as efficient and focused as they should be.



Electric System Operations

Optimal management of electric system operations is a primary focus and essential part of the AESO's mandate.

Effectively maximizing the use of transmission capacity and monitoring transmission system performance is critical to ensure the reliability of the Alberta Interconnected Electric System (AIES).

The AESO operates the AIES and competitive market in accordance with Alberta Reliability Standards.

Electric System Development

One of the AESO's core business activities is to plan a transmission system which reliably meets the electricity needs within the province.

The AESO's Long-term Outlook and Long-term Transmission Plan documents communicate Alberta's expected future demand and energy requirements, expected generation capacity to meet those requirements, and the transmission system enhancements needed to meet these demand and generation requirements. These forecasts and plans form the basis for advancing transmission system projects for regulatory approval and support the integration of market participant projects into the AIES.

Market Development

The wholesale electricity market evolves along with changes in industry, technology and other relevant influences or circumstances. The AESO monitors developments and evaluates the impact of these changes to identify appropriate courses of action. When addressing market changes, the principle objective is to maintain a fair, efficient, and openly competitive (FEOC) market.

Customer Access Services

The primary function of Customer Access Services is to efficiently connect customers to the transmission system and provide solution-oriented customer service throughout the process.

Corporate Services

The general business operations are coordinated through the various activities by the AESO's corporate services departments.

This key process provides various organization-wide support services such as human resources, finance, legal, communications and senior management for establishing the strategic direction of the AESO.

2020 AESO Business Initiatives

The following pages provide a brief update on the progress and plans for the business initiatives in 2020. These business initiatives tend to be multi-year in nature and continue to advance the AESO's strategic objectives.

Externally Focused Initiatives – Stakeholder Participation Related

The following business initiatives for 2020 will have stakeholder impacts and the success of these initiatives will required stakeholder participation. The AESO looks forward to working with stakeholders on these initiatives in 2020.

Business Initiative	Update 2019	Plan 2020
Strategic Initiative – Framework Evolution		
Market sustainability & evolution	**New for 2020**	**Design, Implementation** Determine what, if any, changes are required to the market structure for long-term sustainability through a supply adequacy assessment and determine recommended changes as well as ongoing monitoring and reporting Based on the supply adequacy assessment, initiate stakeholder consultation and design on any recommended changes, which may include price cap, scarcity and shortage pricing Provide the requested reports to the Minister of Energy – February 2020 and July 2020. Initiate design based on any changes in policy direction Continue with the flexibility initiatives including implementation of the dispatch tolerance and ramp rate rule changes and initiate stakeholder engagement for shorter settlement Continue with technology integration market design work to align with the Energy Storage Roadmap and the Distributed Energy Resources (DER) Roadmap

Business Initiative	Update 2019	Plan 2020
Strategic Initiative – Framework Evolution		
Tariff: **Review of bulk and regional transmission rate design**	**Update** Comprehensive consultation to review bulk and regional transmission rate design was ongoing throughout 2019	**Design** The AESO expects to continue with the consultation process concluding with applications to the AUC for any proposed changes to bulk and regional transmission tariff design, targeted for Q2/Q3 2020
Tariff: **General Tariff Application (GTA)**	**Update** Continued implementation of the 2018 ISO tariff application	**Implementation** Implementation of the 2018 ISO tariff decision through the compliance filing and ongoing consultation File the 2020 tariff update January 2020 with the 2018 GTA compliance filing
Long-term system developments	**Base Business for 2019**	**Design, Implementation** Obtain AUC approval for the system projects needed to provide long-term benefit to Albertans, including enabling competitive generation included in the AESO's *2020 Long-term Transmission Plan*, to be published January 31, 2020
Distribution Engagement	**Update** Development of DER Roadmap complete and implementation initiated	**Design, Implementation** Continue implementation of the DER roadmap
Stakeholder Engagement Framework	**Update** Development of stakeholder engagement framework	**Implementation** Finalize stakeholder engagement framework and initiate organization-wide implementation activities to provide stakeholders a more transparent and meaningful experience

Business Initiative	Update 2019	Plan 2020
Strategic Initiative – Technology		
External Technology Plan	**Update** Development of a strategy and plan to provide optionality and integration of new grid technologies resulting in an AESO Strategic Integration Plan including Energy Storage and Flexibility Roadmaps	**Design, Implementation** Advance technology plan for integrating new electricity value chain technologies, including enhancing AESO awareness, engaging industry, and progressing technology integration plans for energy storage and distributed energy resources
Strategic Initiative – Grid and Market Operations Tools		
Grid Market Operations (GMO) System	**Update** Continued to evolve and sustain our EMS system by identifying implementation options, process changes and system impact assessment to support the market transition Advanced EMS Core according to planned schedule, utilizing key features and functionality while maintaining system performance, security and compliance	**Design, Implementation** Deliver a sustainable EMS investment plan and development of a long-term market tools transition plan supporting future energy and Ancillary Services (AS) market plans

AESO Internal Initiatives

The following initiatives are internal to the AESO and require limited stakeholder participation. These internal initiatives are focused on transitioning the AESO as an organization to align with the transformation of the electricity industry in Alberta. A transformation resulting from future changes, such as technologies that impact the electrical system.

Business Initiative	Plan and Update 2019	Plan 2020
Strategic Initiative – People and Culture		
Nurture an inclusive and innovative culture of engagement and excitement to prepare the organization for the transformative environment ahead	**Update** Created a plan to guide the cultural evolution that will be required 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 first year deliverables of defined cultural evolution plan	**Implementation** Continue 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. Deliver on second year deliverables of the defined cultural evolution plan
Workforce capabilities and stakeholder education	**Update** Defined the AESO's knowledge philosophy and conducted an enterprise knowledge needs assessment considering the changing competencies required to support a cultural evolution and delivery of the *2019-2023 Strategic Plan*, as well as external stakeholder education needs	**Design, Implementation** **Implementation** Implement findings from the needs assessment and knowledge management plan to support a cultural evolution and delivery of the *2019-2023 Strategic Pla*n **Design** Redesign external education content and programming Define customer experience needs and develop a plan to more effectively address these needs
Strategic Initiative – Framework Evolution		
Settlement audit	**New for 2020**	**Design, Implementation** Initiate a settlement audit of AESO settlement processes

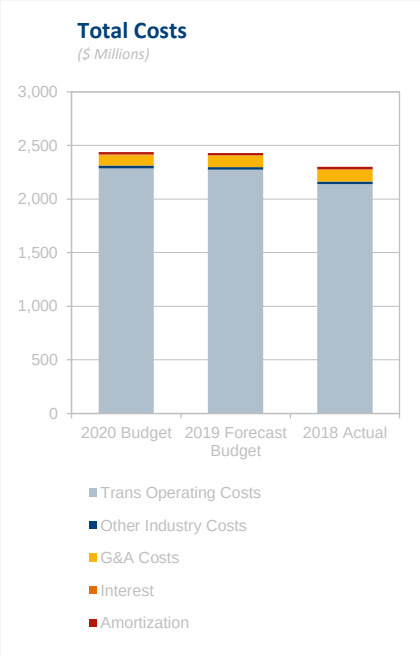
Business Initiative	Plan and Update 2019	Plan 2020
Strategic Initiative – IT		
Productivity	**Update** Developed AESO multi-year technology program focused on productivity Initiated development of AESO multi-year technology productivity program plan and identified key opportunities to pursue in 2020 Development of justification documents (e.g., business cases) to advance key opportunities	**Design, Implementation** Complete implementation of the AESO personal productivity foundation to increase efficiency and position AESO for further advancements in future years Continue the modernization of the finance and contract management systems, increasing the efficiency, quality and timeliness of information. And processes. Create efficiencies and functionality through an integrated talent management system (Human Resources Information System) to support AESO's practices and programs Commence the modernization of market system user experience for both internal staff and market participants
Cybersecurity and Critical Infrastructure Protection (CIP) optimization	**Base Business for 2019**	**Design, Implementation** Enhance cybersecurity protections to further secure the organization against increasing threats Optimize the AESO Critical Infrastructure Protection (CIP) program and comply with the new CIP-014 Physical Security standard

Financial Highlights

As part of this *2020 Business Plan and Budget Proposal*, the AESO is presenting the forecasts and budgets which are required to meet the needs of the organization to deliver on its commitments and to demonstrate that financial management continues to be a focus.

The financial information is presented in the following four sections:

- **Section I** - Transmission Operating and Other Industry Costs
  A. Year-to-date September, including 2019 projection; and
  B. 2020 forecast.
- **Section II** - General and Administrative, Interest and Amortization Costs
  A. Year-to-date September 2019; and
  B. 2020 budgets.
- **Section III** – Capital Costs
  A. Year-to-date September 2019; and
  B. 2020 budgets.
- **Section IV** – Revenue



Additional information is included in Appendices B to H.

($ million) ~ by production year

	2020 Forecast/ Budget	2019 Projection[2]	2019 Forecast/ Budget[3]	2018 Actual
Transmission Operating Costs	**2,287.4**	2,189.1	2,274.5	2,139.9
Other Industry Costs	**24.5**	25.9	23.8	23.8
General and Administrative	**96.2**	103.6	106.0	111.1
Interest Costs	**7.1**	5.3	3.6	1.4
Amortization	**22.1**	35.4	21.2	26.1
Capital Expenditures	**29.3**	44.3	49.4	25.3

Differences are due to rounding

[2] Amounts are the current projection for 2019 costs

[3] Amounts are from the 2019 BRP (budgets and forecasts currently AESO Board approved). The 2019 general and administrative budget amount originally approved by the AESO Board was $109.7 million. The approved amount has been amended to $106.0 million to reflect new accounting requirements for leases as required by International Financial Reporting Standards (IFRS).

SECTION I – TRANSMISSION OPERATING AND OTHER INDUSTRY COSTS

A. Year-to-Date September 2019

The following table provides a summary of actual costs as of September 2019 compared to the forecasted amounts for the same period. Additional information on year-to-date costs and a cost projection for 2019 is provided in Appendix B (Year-to-Date September 2019 Financial Results Detail).

Year-to-Date September 2019 Costs ($ million) ~ by production year

	YTD September Actual	YTD September Forecast	YTD September Variance	2019 Projection	2019 Forecast
Wires Costs	1,390.8	1,375.9	14.9	1,851.8	1,834.6
Transmission Line Losses	84.1	98.6	(14.5)	108.9	126.1
Operating Reserves	151.9	221.2	(69.3)	200.5	270.6
Other Ancillary Service Costs	20.2	32.4	(12.2)	27.8	43.2
Transmission Operating Costs	1,647.0	1,728.2	(81.2)	2,189.1	2,274.5
Other Industry Costs	20.2	17.9	2.3	25.9	23.8

Differences are due to rounding

B. 2020 Forecast

Transmission Operating Costs

The following table provides a summary of transmission operating costs.

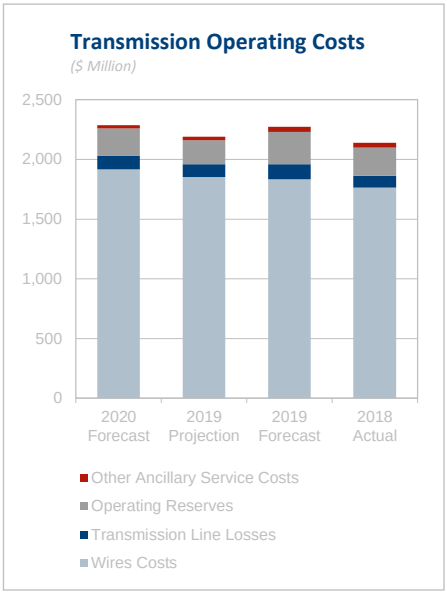
Transmission Operating Costs ($ million) ~ by production year

	2020 Forecast	2019 Projection	2019 Forecast	2018 Actual	2017 Actual
Wires Costs	**1,916.0**	1,851.8	1,834.6	1,763.8	1,740.1
Transmission Line Losses	**113.5**	108.9	126.1	98.3	50.4
Operating Reserves	**229.1**	200.5	270.6	235.8	80.7
Other Ancillary Service Costs	**28.7**	27.8	43.2	41.9	34.3
Transmission Operating Costs	**2,287.4**	2,189.1	2,274.5	2,139.9	1,905.5

Differences are due to rounding

Additional information on the 2020 forecast methodology and descriptions of the cost categories is provided in Appendix C (Transmission Operating Cost Definitions).

Wires



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

Wires costs include long-term contracts related to Invitation to Bid on Credit (IBOC) and Location Based Credit Standing Offer (LBC SO) programs, since these programs were initiated as incentives for generation to locate closer to major load centres and provide a non-wires solution to transmission wires issues in Alberta.

The 2020 forecast for wires costs is $1,916.0 million, which is $64.2 million or 3 per cent higher than the 2019 projection of $1,851.8 million. The 2020 forecast is based on TFO tariffs ($1,911.2 million) and the AESO's forecast for IBOC and LBC SO costs ($4.8 million).

The 2019 projection is based on TFO tariffs approved or applied-for as of November 2019 with a majority of the projection reflecting: i) filed 2019 tariffs; ii) filed 2019 negotiated settlements; or iii) AUC approvals for 2018 and 2019 tariffs.

The 2020 forecast is based on TFO tariffs approved or applied-for as of November 2019 with a majority of the forecast reflecting: i) filed 2020 tariffs; ii) filed 2020 negotiated settlements; or ii) AUC approvals for 2018 and 2020 tariffs.

Transmission Line Losses

The 2020 forecast for transmission line losses is $113.5 million, which is $4.6 million or 4 per cent higher than the 2019 cost projection of $108.9 million, primarily due to a forecast increase in pool prices. Transmission line losses costs were originally forecast to be $126.1 million for 2019; however the average pool price was less than forecast.

The 2020 transmission line losses volume forecast is 1,870 gigawatt hours (GWh), which is 4 gigawatt hours and less than 1 per cent lower than the 2019 projection of 1,874 gigawatt hours. The volume of losses is expected to remain flat in 2020 despite expected load growth due to changes in generation dispatches likely resulting from more gas-fired generation in conjunction with less coal-fired generation.

The average pool price used for the 2020 forecast is $58 per megawatt hour (MWh), which is 4 per cent higher than the 2019 projection of $56 per MWh. The 2019 forecast was based on a $58 per MWh average pool price. The higher 2020 pool price is due in part to slightly more high-priced hours than the 2019 projection due to market fundamentals such as the carbon pricing regimes, mothballs/retirements of coal assets, natural gas prices, and Renewable Electricity Program (REP) Round 1 additions.

Operating Reserves

The 2020 forecast for operating reserves costs is $229.1 million, which is $28.6 million or 14 per cent higher than the 2019 cost projection of $200.5 million.

The average pool price used for the 2020 forecast is $58 per MWh, which is 4 per cent higher than the 2019 projection of $56 per MWh.

Contributing to higher operating reserve costs is the impact of the active operating reserves prices, which are the most significant operating reserve costs and are derived from pool price and a premium or discount to pool price. During periods of low pool prices, the discounts offered reflect the offer strategies associated with the lower pool prices, which are low or small discounts. In periods of higher pool prices, the discounts will typically increase to correspond with the higher pool prices. While the prices of operating reserves procured are indexed to the pool price, changes to the average pool price do not result in proportional changes to the operating reserve costs. The discounts used in the 2020 forecast follow the established forecast methodology.

The 2020 operating reserves volume forecast is 7.8 terawatt hours, which is 0.1 terawatt hours or 1 per cent lower than the 2019 projection of 7.9 terawatt hours associated with a forecasted decrease in import volumes compared to 2019.

Operating reserves costs were originally forecast to be $270.6 million for 2019, which was based on a $58 per MWh average pool price for 2019.

Other Ancillary Services

The AESO procures other ancillary services for the secure and reliable operation of the Alberta Interconnected Electric System (AIES). These services are procured through a competitive procurement process where possible, or in such instances where procurements may not be feasible, through bilateral negotiations.

Other Ancillary Services Costs ($ million) ~ by production year

	2020 Forecast	2019 Projection	2019 Forecast	2018 Actual	2017 Actual
Load Shed Service for Imports	**20.6**	18.0	32.8	31.0	22.9
Contracted Transmission Must-run	**2.4**	3.1	3.2	3.1	3.0
Conscripted Transmission Must-run	**0.4**	0.4	0.2	0.4	0.5
Reliability Services	**2.9**	2.9	2.9	2.9	2.9
Poplar Hill	**-**	0.9	1.7	2.4	2.8
Black Start	**2.3**	2.3	2.3	2.2	2.1
Transmission Constraint Rebalancing	**0.1**	0.3	0.1	0.0	0.0
Other Ancillary Service Costs	**28.7**	27.8	43.2	41.9	34.3

Differences are due to rounding

The 2020 forecast for other ancillary services costs is $28.7 million, which is $0.9 million or 3 per cent higher than the 2019 cost projection of $27.8 million.

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 forecasted to be $20.6 million, which is $2.6 million or 14 per cent higher than the 2019 projection of $18.0 million. The 2020 forecast is based on the expected operations of the transmission system in 2020 and reflects contract pricing for LSSi services. The forecast

for 2020 is based on historical averages for armed energy and availability, wherein 2019 experienced lower LSSi utilization due to lower than historical import volumes. Lower import volumes were the result of lower import incentive driven by lower demand and limited coal outages, both of which helped to avoid price spikes.

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. A generator can be contracted to provide such services in an area or 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). For 2019 year-to-date, there have been more events requiring conscripted TMR than was anticipated in the 2019 forecast. The 2020 forecast includes generators under contract, with conscripted TMR anticipated to be consistent with 2019 projected amounts based on similar operating conditions expected in 2020.

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 2020 forecast reflects the contact terms.

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 of 2019.

Black start services are required in each region of the province though supplier availability may be limited in certain regions. The 2019 projection and 2020 forecast reflect contract pricing for black start services.

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. There are no significant events expected in 2020.

Other Industry Costs

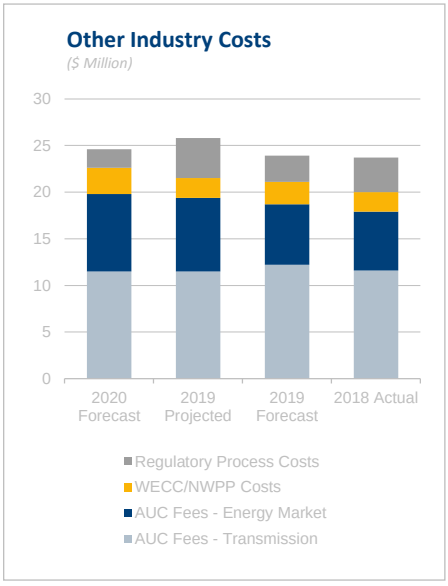
Other industry costs represent fees or costs paid based on regulatory requirements or membership fees for industry organization. The amounts or requirement for these costs are not under the direct control of the AESO. These costs relate to the annual administration fee for the AUC, the AESO's share of Western Electricity Coordinating Council (WECC), Northwest Power Pool (NWPP) and North America 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 ($ million)

	2020 Forecast	2019 Projection	2019 Forecast	2018 Actual	2017 Actual
AUC Fees – Transmission	**12.0**	11.5	12.2	11.6	11.8
AUC Fees – Energy Market	**6.4**	7.9	6.5	6.3	6.0
WECC/NWPP/NERC Costs[4]	**2.8**	2.1	2.4	2.1	2.2
Regulatory Process Costs	**3.3**	4.3	2.8	3.7	1.2
Other Industry Costs	**24.5**	25.9	23.8	23.8	21.2

Differences are due to rounding

AUC Fees



The AESO is required to pay annual administration fees to the AUC. The AUC recovers its operating and capital costs through an administration fee imposed on the natural gas and electricity market participants that it has jurisdiction over or any person to whom the AUC provides services. The AUC uses a cost assessment model to allocate its costs to the various classes and categories of utilities and persons, and to determine the amount of the administration fee. Two classes of fees are paid to the AUC – one related to transmission operations and the other to energy market operations.

WECC/NWPP/NERC Fees

The AESO is an active member of the WECC, the organization that fosters and promotes reliability and efficient coordination in the Western Interconnection. Its members coordinate the day-to-day interconnected system operations and long-range planning required to provide reliable electric service in the WECC region that extends from Canada to Mexico and includes the provinces of Alberta and British Columbia, the northern portion of Baja California Norte, Mexico, and all or portions of the 14 Western states between.

The AESO is also a member of the NWPP, which operates to achieve maximum benefits of coordinated operations for its member organizations. Participation in the NWPP allows the AESO to take advantage of their Reserve Sharing Group, thereby reducing Alberta's reserve requirements at times.

In addition, the AESO is also a member of the NERC and supports their organization for the development of reliability standards for the North American electricity grid.

The 2020 forecast for AESO's fees is $2.8 million, which has increased slightly from the 2019 forecast and prior year amounts.

[4] Western Electricity Coordinating Council/Northwest Power Pool/North American Electric Reliability Corporation

Regulatory Process Costs

The costs associated with the AESO's involvement in an AUC proceeding to hear objections and complaints to ISO Rules or any regulatory application are included in the cost category Regulatory Process Costs; this does not include application preparation costs. These proceedings become a high priority relative to other business initiatives that were identified in the business planning process, and the level of AESO resources required to address these matters brought before the AUC is difficult to determine in advance of a budget year. To ensure ongoing focus and achievement of the planned business initiatives and to avoid constraints on the general and administrative budget management, these costs appear as other industry costs. Intervener costs that received AUC cost order approval are also included in this category.

The 2020 forecast for regulatory process costs is $3.3 million, which is $1.0 million or 23 per cent lower than the 2019 projection of $4.3 million. The 2019 projected costs are related to AESO's involvement in several significant regulatory proceeding in 2019 including: capacity market – provisional proceeding; 2018 ISO tariff proceeding; and various Need Identification Document (NID) proceedings. With the Government of Alberta's (GoA) decision to cease implementation of a capacity market, the 2020 forecast costs are expected to decrease.

SECTION II – GENERAL & ADMINISTRATIVE, INTEREST AND AMORTIZATION COSTS

A. Year-to-Date September 2019

The following table provides a summary of actual costs as of September 2019 compared to the budgeted costs for the same period. Additional information on year-to-date costs is provided in Appendix B (Year-to-Date September 2019 Financial Results Detail).

Year-to-Date September 2019 Costs ($ million)

	YTD September 2019 Actual	YTD September 2019 Budget	YTD Variance	2019 Budget[5]
General and Administrative Costs	76.6	79.5	(2.9)	106.0
Interest	3.8	2.7	1.1	3.6
Amortization of Intangible and Depreciation of Capital Assets	28.9	15.9	13.0	21.2

Differences are due to rounding

[5] In AESO Board Decision 2019-BRP-001.

B. 2020 Budgets

In the *2020 Business Plan and Budget Proposal* (Proposal), AESO Management continues to focus on the key business initiatives in 2020 as outlined earlier in this Proposal. The key business initiatives tend to be multi-year in nature and are at various stages of development or implementation. The internal budget discussions focused on the delivery of these key initiatives while continuing to provide the safe, reliable and economic operation of the electric system in Alberta.

Subsequent to the GoA's 2019 decisions to not continue with the Renewable Electricity Program (REP) procurements and capacity market initiatives, AESO Management undertook a detailed review of its staff and consulting resources. Department and individual staff positions were reviewed to assess if excess capacity existed from the GoA decision. In addition, a high-level assessment was undertaken of the AESO's organizational structure to identify opportunities for efficiencies and how the AESO should be structured going forward to achieve its objectives.

As a part of Management's review, resources were assessed to determine if they were adequate, on an overall basis, to deliver on the AESO's base business and initiatives for 2020. Consideration was also given to the need for specialized knowledge, skills or cost-effective resources, as well as resource constraints due to workflow and timing of initiatives and risk management requirements.

The AESO, as a trusted leader, continues to focus on its vision to shape the transformation of Alberta's electricity future to deliver reliability and enhance the quality of life for Albertans. To deliver on this vision the AESO is driven to be a dynamic organization with the expertise and agility to adapt to transformative change; deliver a stable electricity framework that provides reliability at lowest cost; and provide optionality for consumers and industry to integrate new technologies and approaches.

For 2020, the business initiatives will be focused on the following activities:

- Market sustainability and evolution, including supply adequacy assessments to determine what, if any, changes are required to the market structure for long-term sustainability; continuation of flexibility initiatives; and technology integration market design work to align with the Energy Roadmap and the Distributed Energy Resources (DER) Roadmap;
- Long-term system developments to provide long-term benefit to Albertans, including enabling competitive generation included in the AESO's published *2020 Long-term Transmission Plan*;
- Distribution engagement with continued implementation of the DER roadmap;
- Finalization of the stakeholder engagement framework to provide stakeholders a more transparent and meaningful experience;
- Advancement of the external technology plan for integrating new electricity value chain technologies, including enhancing AESO awareness, engaging industry, and progressing technology integration plans for energy storage and distributed energy resources; and
- Delivery of a sustainable EMS investment plan and a long-term market tools transition plan supporting future energy and Ancillary Services market plans.

In preparing the 2020 Business Plan, AESO Management considered the information currently available to assess the impact on both the business initiatives and budget requirements. As time progresses, new information or events may require a change to the AESO's planned activities that if material in nature, may require further stakeholder and AESO Board consideration on the impact. Appendix H highlights the circumstances and processes that would be undertaken in these circumstances.

General and Administrative Costs

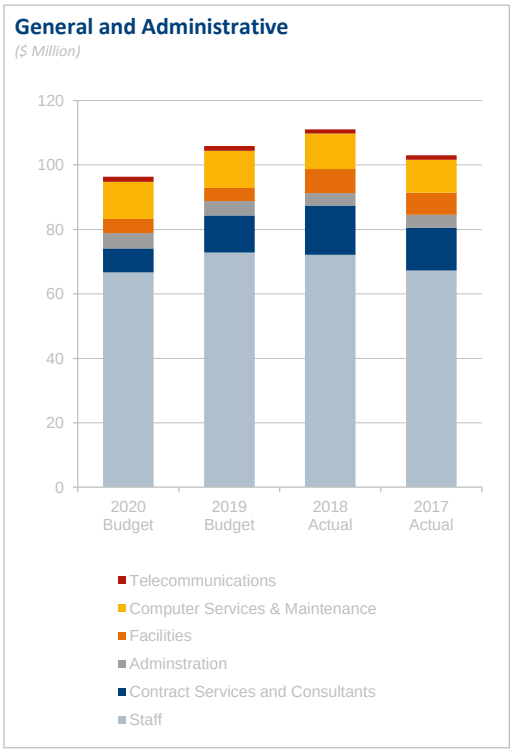
General and Administrative Costs ($ million)

	2020 Budget	2019 Budget	2018 Actual	2017 Actual
Staff	**66.7**	72.8	74.3	67.3
Contract Services and Consultants	**7.4**	11.5	12.1	13.3
Administration	**4.8**	4.5	4.4	3.9
Facilities	**4.3**	4.1	7.6	6.9
Computer Services and Maintenance	**11.6**	11.5	11.2	10.2
Telecommunications	**1.5**	1.5	1.5	1.4
General and Administrative Costs	**96.2**	106.0	111.1	103.0

Differences are due to rounding

On an ongoing basis, the AESO adapts to new and changing initiatives while maintaining reliable operations of the AIES and other core AESO functions. During the period from 2017 through July 2019, the funding for the AESO's operations reflected costs to deliver on key business initiatives (design and implementation of a new market framework, design and implementation of a REP program, implementation of CIP Standards and operations of a new EMS). In view of discontinuation of the REP procurements and capacity market initiatives, AESO's 2020 proposed general and administrative budget is $96.2 million, a decrease of $9.8 million or 9 per cent from the 2019 budget of $106.0 million.

Appendix D of this Proposal (2020 General and Administrative Cost Detail) provides additional narrative on the specific cost areas.



The staff costs are $66.7 million in 2020, a decrease of $6.1 million over the prior year. The decrease is a result of AESO Management's detailed review of its staff and consulting resources, which led to significant staff reductions. The forecast vacancy rate was also impacted by these efforts, as well as miscellaneous other directly related staff costs. These net reductions are partially offset by a proposed staff compensation increase to adjust staff compensation to align with market compensation.

Contract services and consultants costs typically vary from year to year as the AESO hires these resources to supplement staff when it is not practical to permanently retain staff with specific skill sets that may only be required for certain initiatives and to address workload peaks to maintain seamless operations. Contractor and consulting costs are expected to decrease by $4.1 million in 2020 as a result of reduced requirements for services related to cessation of the capacity market implementation and future REP competition rounds.

Administrative costs primarily relate to insurance, office costs, corporate subscriptions, general business travel, staff recruiting and training and associated travel, corporate meetings and related meals, including costs

related to stakeholder consultation sessions. The higher budgeted costs in 2020 compared to 2019 are primarily associated with an increase in insurance premiums, increased corporate subscription costs and increased recruiting fees.

Facilities costs relate to office space rent and operating costs, and operating costs related to the AESO System Coordination Centre (SCC). Budgeted facilities costs for 2019 have been amended to reflect the adoption of International Financial Reporting Standard 16 – *Leases* (IFRS 16), which reclassifies the costs of various facility leases to amortization of right-of-use assets and interest expense. The increase in amended facility costs is due to the inclusion of operating costs in the 2020 budget due to completion of the AESO's SCC Expansion project in Q4 2019.

On an annual basis, the AESO invests in software applications and systems to support the business and IT infrastructure needs which then require ongoing maintenance and licence agreements for support. The increase is primarily due to higher vendor costs related to inflation adjustments for licenses and contracted costs

The reallocations and budget changes are summarized as follows:

($ million)

2019 Approved Budget		**$ 109.7**
Adjustment for lease costs for IFRS 16		(3.7)
Adjusted 2019 Budget		**$ 106.0**
Staff	(6.1)	
Contract Services and Consultants	(4.1)	
Administration	0.2	
Facilities, Computer Services and Maintenance & Telecommunications	0.1	**(9.8)**
2020 Proposed Budget		**$ 96.2**

Differences are due to rounding

Interest Costs and Amortization

Interest Costs and Amortization ($ million)

	2020 Budget	2019 Budget	2018 Actual	2017 Actual
Interest	**7.1**	3.6	1.4	0.5
Amortization of Intangible and Depreciation of Property, Plant and Equipment	**22.1**	21.2	26.1	20.4

Differences are due to rounding

Interest expense is incurred as a result of bank debt held throughout the year and the associated borrowing rate. Bank debt is issued to fund intangible and capital asset purchases, prepayments of future expenses and working capital deficiencies due to timing differences in the collection of revenues and payment of expenses. Intangible and capital assets are financed through the AESO's credit facilities and recovered over the useful lives of the assets (included in amortization).

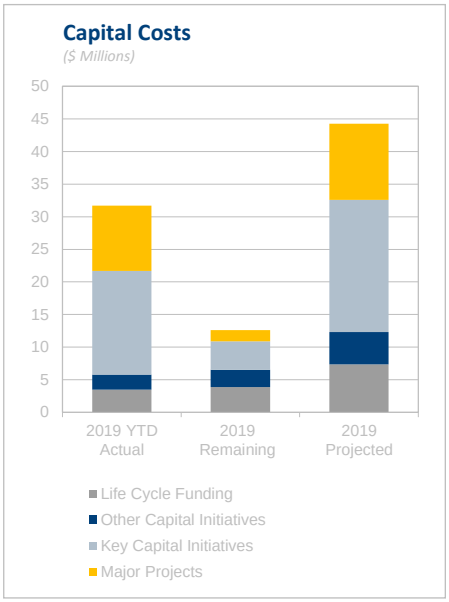
Additional interest costs are budgeted for 2020 related to accumulated working capital deficiencies, of which some will be recovered throughout 2020 and others, such as portions of energy market and REP related deficiencies, will be deferred and recovered in future periods.

Intangible and capital assets are amortized over their estimated useful lives in accordance with generally accepted accounting principles and reviewed on an annual basis. The higher amortization in 2020 is mainly due to a higher depreciable asset base in 2020 over 2019.

Additional information on the AESO's 2020 capital projects is provided in Appendix E (2020 Capital Projects).

SECTION III – CAPITAL COSTS

A. Year-to-Date September 2019



The capital spending for the first nine months of 2019 is $31.7 million. In general, the AESO's capital projects, which are predominately multi-year in nature, have not all continued to progress as planned, specifically with the decision to not continue with the implementation of the capacity market. However, the continuation of the SCC Expansion project implementation phase was continued and completed as planned in Q4 2019.

The following table provides a summary of the current capital project investment for 2019.

Additional information on the status and progress of specific projects is provided in the following section, Appendix B (Year-to-Date September 2019 Financial Results Detail) and Appendix E (2020 Capital Projects).

Capital Expenditures ($ million)

	2019 YTD September Actual	2019 Remaining	2019 Projection[6]
General Capital[7]	21.7	11.0	32.7
Major Projects[8]	10.0	1.7	11.7
Total Capital Spending	31.7	12.6	44.3

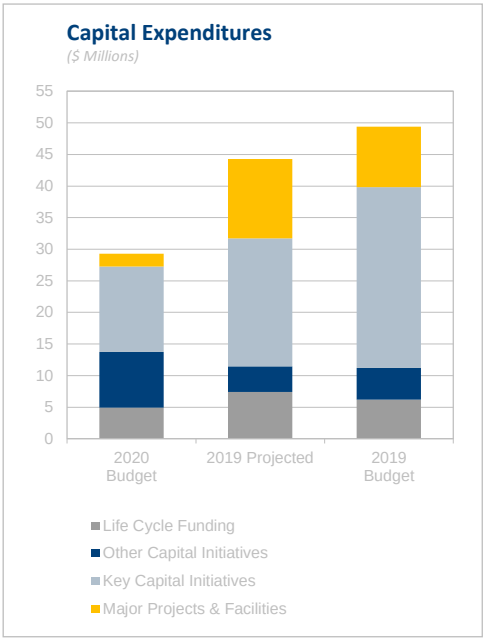
Differences are due to rounding

[6] Projection – Spent to date plus estimate to complete current year

[7] General capital includes the project categories of key, other and life cycle

[8] Major capital includes programs or projects that due to their size (generally single project, greater than $1 million and multiple years in duration) cannot be managed within the general capital budget

B. 2020 Budget



A detailed review of the capital requirements for 2020 takes into consideration the progress that has been made on the inflight projects that are multi-year in nature, the new requirements for 2020 and the AESO's capacity to design and implement system solutions. Based on these findings, the capital budget is $29.3 million for 2020.

The variance between the 2019 and 2020 capital budgets is a decrease of $20.1 million from $49.4 million to $29.3 million. The decrease is mainly attributable to the Key Capital initiatives related to the capacity market implementation, which were part of the 2019 budget, but not required for the 2020 budget due to the Government of Alberta's decision announced July 24, 2019 that Alberta will not transition to a capacity market and will continue with an energy-only market. The Key Capital budget also decreased due to lower EMS sustainment budgeted costs in the 2020 budget compared to 2019. Additionally, the capital budget has decreased due to the completion of the SCC Expansion project in 2019.

The variance between the 2019 projection and 2019 budget is a net decrease of $5.1 million. The related general capital budget has a greater variance with a decrease of $7.7 million, to $32.7 million compared to $40.4 million, which is mainly attributable to the AESO cancelling the capital projects related to the capacity market initiative and the decrease in the EMS sustainment project spend which has been deferred to future years. The related major capital budget variance is an increase of $2.7 million to $11.7 million from $9.0 million. This is attributable to the SCC Expansion project timing, as certain work occurred in 2019 which was originally expected to occur in late 2018 (the SCC Expansion project was completed in 2019 on budget).

The AESO considers the budgeting process for capital expenditures as the determination for the annual level of capital expenditures for use in the internal portfolio management process; not the review and approval of specific capital projects. All capital projects initiated by the AESO are reviewed and approved through the portfolio management process. This process is led by senior management and facilitates a regular review and prioritization of major projects to ensure business requirements are met and, at the same time, achieve the most beneficial and cost-effective results. This process also allows for the flexibility required to re-evaluate capital plans throughout the year.

The following table identifies a preliminary list of projects that are planned for 2020 based on current operations and the business initiatives. As time progresses across the identified planning period, requirements and circumstances may change and the portfolio management process will be used to manage these changes throughout the period.

Additional information on the 2020 capital projects is provided in Appendix E (2020 Capital Projects).

Capital Expenditures ($ million)

	2020 Budget	2019 Budget	2018 Actual
Key Capital Initiatives – Capacity Market	**-**	11.0	1.7
Key Capital Initiatives – EMS[9] Sustainment	**4.8**	13.0	-
Key Capital Initiatives – Other	**8.7**	4.5	2.8
1. Critical Infrastructure Protection (CIP)	1.0	1.0	0.3
2. Cyber and Physical Security Advancements	1.9	2.0	1.4
3. Market Evolution – Other	1.6	1.5	0.5
4. Productivity Application and Tools	3.3	-	-
5. Critical Systems External Interface Modernization	0.8	-	-
6. Reliability – Other (non-EMS)	-	-	0.4
7. MSR[10] – Sustainment	-	-	0.2
Total Key Capital Initiatives	**13.5**	28.5	4.5
Other Capital Initiatives	**8.9**	5.0	7.4
Facilities	**2.1**	0.6	0.1
Life Cycle Funding	**4.9**	6.2	5.2
Sub-total General Capital	**29.3**	40.4	17.2
Major – SCC [11]	**-**	9.0	8.1
Total Capital	**29.3**	49.4	25.3

Differences are due to rounding

Key Capital Initiatives represent the most critical capital projects over the planning period that must be completed within the identified timeframe.

Other Capital Initiatives are also necessary projects; however, there is more flexibility in planning or delivery so timing is not as critical as the Key Capital Initiatives.

Life Cycle Initiatives are typically replacement of end-of-life IT hardware and recurring software upgrades.

Major Project Initiatives are programs or projects that due to their size (generally single project, greater than $1 million and multiple years in duration) cannot be managed within the general capital budget. These programs or projects require stakeholder consultation and AESO Board approval.

[9] Energy Management System

[10] Market System Replacement and Reengineering

[11] System Coordination Centre Expansion

SECTION IV – REVENUE

The AESO recovers its operating and capital costs through four separate revenue sources. Each is designed to recover the costs directly related to a specific service as well as a portion of the shared corporate services costs. The AESO's operations integrate the functions of transmission, energy market, renewables and load settlement to maximize benefits under the *Electric Utilities Act* (EUA). This integration results in cost allocations in many parts of the organization for the purpose of cost recovery. In determining the revenue requirement on a function-by-function basis, all AESO costs are assigned or allocated to one of the four functions. Additional information on the cost allocation methodology is provided in Appendix G (Allocation of Costs).

Transmission

The AESO is responsible for paying the costs of the provincial transmission system and recovering the costs through a tariff approved by the AUC. The ISO tariff is designed to allocate the costs to all users of the transmission system based on level of usage. The budget costs related to the transmission function will be incorporated into the AESO's tariff rates.

Energy Market

The AESO recovers the costs of operating the real-time energy market through an energy market trading charge on all megawatt hours traded. Based on the 2020 budget and a current trading volume forecast, an energy market trading charge of 42.6¢ per MWh traded is required to recover the AESO's budgeted costs for 2020.

The trading charge for 2020 is slightly higher than 2019 as a result of the continued charge for the recovery of a capacity market deficit carried forward from 2018, as well as an additional deficit from 2019 which incorporates a $10.7 million write-off of capacity market assets that no longer hold future value for the AESO. The 2018 deficit is due to the February 2018 amendment of the AESO's budget to accommodate additional costs for capacity market initiatives. The 2018 trading charge was not adjusted for the budget amendment. It was indicated during the BRP that the trading charge would not be amended and any shortfall would be recovered through future trading charge adjustments. The AESO plans to recover the estimated cumulative shortfall at the end of 2019 over the period 2020 through 2022.

The AESO costs are 31.1¢ per MWh traded, representing a decrease of 3.6¢ per MWh traded or 10 per cent from the 2019 rate of 34.7¢ per MWh traded. The decrease is attributed to the cessation of the capacity market initiative in 2019.

These trading charge amounts are independent of the Market Surveillance Administrator (MSA) charge. The MSA cost recovery amount is approved by the Chair of the AUC in an independent budget process.

Trading Charge Recoverable Amounts ($ million)

	2020	2019	2018	2017	2016	2015
AESO Costs	**41.5**	46.8	30.4	30.2	34.5	35.6
Energy Market Shortfall / (Surplus)	**8.9**	4.0	(7.0)	-	-	4.3
AESO Component	**50.4**	50.8	23.4	30.2	34.5	39.9
AUC's Portion of Energy Market Administration Fee	**6.4**	6.5	6.5	6.0	7.0	7.2
Total Recoverable Amount	**56.8**	57.3	29.9	36.2	41.5	47.1

Differences are due to rounding

Trading Charge (¢ per MWh)

	2020	2019	2018	2017	2016	2015
AESO Costs	**31.1**	34.7	23.7	26.2	26.2	27.0
Energy Market Shortfall / (Surplus)	**6.7**	3.0	(5.5)	-	-	3.2
AESO Component	**37.8**	37.7	18.2	26.2	26.2	30.3
AUC's Portion of Energy Market Administration Fee	**4.8**	4.8	3.2	5.3	5.3	5.5
Total	**42.6**	42.5	21.4	31.5	31.5	35.8

Differences are due to rounding

Renewables

The AESO is responsible to administer the Renewable Electricity Program and recover the costs through fees charged to participants in the competitive process and generators that receive renewable energy credits. Any cumulative shortfalls of revenue over costs will be recovered at the conclusion of the program.

Load Settlement

Expenses that the AESO incurs to provide services related to administering provincial load settlement are charged to the owners of electric distribution systems and wire service providers conducting load settlement under AUC Rule 21 *Settlement System Code Rules*.

Appendix A: Alberta Electric System Operator 2019-2023 Strategic Plan

The AESO develops a new strategic plan every four to five years, which serves as a foundational document for defining and communicating the direction and focus of the organization for the strategic plan timeframe. The *Alberta Electric System Operator 2019–2023 Strategic Plan* serves as the starting point for the development of this business plan, and the subsequent business plans and budgets that will follow. The AESO continues to believe the current strategic plan is applicable for 2020.

AESO Mission

The AESO provides for the safe, reliable and economic operation of the Alberta electricity system while facilitating a fair, efficient and openly competitive market for electricity.

AESO Vision

As the trusted leader, the AESO is shaping the transformation of Alberta's electricity future to deliver reliability and enhance the quality of life for Albertans.

Strategic Objectives

The AESO pursues the following three key objectives:

People

We will be a more dynamic organization with the expertise and agility to adapt to transformative change.

This is about people and process – ensuring we are positioned to meet future demands.

Framework

We will deliver a stable electricity framework that provides reliability at lowest cost through competition as we bridge from the current transition to the broader industry transformation.

With potential changes to the energy-only market, changes in transmission policy and with an evolving generation fleet, we are focused on creating a foundation that provides clarity to investors, thereby creating investor confidence.

Technology

We will provide optionality for consumers and industry to integrate new technologies and approaches while we maintain the overall reliability of the grid.

Changes in social demands and consumer preferences will drive new and innovative technologies across the entire electricity value chain; we will position the electricity system to accommodate the influx of new technologies.

These objectives are interrelated and interdependent; and by achieving them, the AESO will continue to operate in the public interest of all Albertans and ultimately realize our vision.

Appendix B: Year-to-Date September 2019 Financial Results Detail

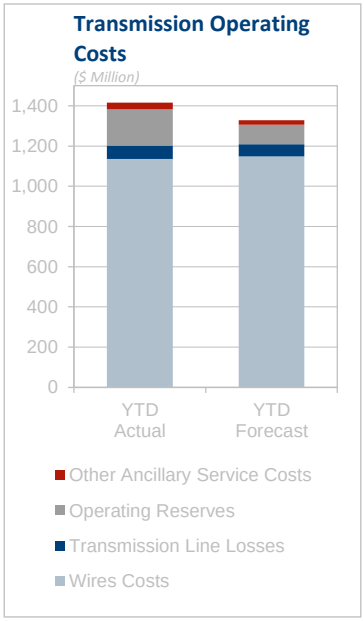
Year-to-Date September 2019 Transmission Operating Costs ($ million) ~ by production year

	YTD September Actual	YTD September Forecast	YTD Variance	2019 Projection[12]	2019 Forecast
Wires Costs	1,390.8	1,375.9	14.9	1,851.8	1,834.6
Transmission Line Losses	84.1	98.6	(14.5)	108.9	126.1
Operating Reserves	151.9	221.2	(69.3)	200.5	270.6
Other Ancillary Service Costs	20.2	32.4	(12.2)	27.8	43.2
Transmission Operating Costs	1,647.0	1,728.2	(81.2)	2,189.1	2,274.5

Differences are due to rounding

Transmission Operating Costs

The table above provides the transmission operating costs as of September 2019 compared to the forecast for the same period.



Transmission operating costs represent wires, transmission line losses and ancillary services costs. As of September 2019, actual costs of $1,647.0 million are $81.2 million or 5 per cent lower than the year-to-date September forecast costs of $1,728.2 million.

Wires Costs

Wires costs as of September 2019 of $1,390.8 million are $14.9 million or 1 per cent greater than the year-to-date September forecast costs of $1,375.9 million based on the amounts paid primarily to the TFOs in accordance with their AUC-approved tariffs.

Transmission Line Losses

Transmission line losses costs at the end of September 2019 are $84.1 million, which is $14.5 million or 15 per cent lower than the year-to-date September forecast of $98.6 million. The cost of transmission line losses is impacted by the pool price and losses volumes. Transmission line losses costs are projected to be $108.9 million for 2019.

The year-to-date September 2019 actual average hourly pool price is $58 per MWh, which is less than the year-to-date September forecast of $61 per MWh and higher than the annual projected pool price of $56.

Transmission line losses volumes to the end of September are 1,410 gigawatt hours, which is 149 gigawatt hours or 10 per cent lower than the year-to-date September 2019 forecast volumes of 1,559 gigawatt hours. The decrease in volumes of losses is likely attributed to changes in generation dispatches

[12] Transmission Operating and Other Industry Costs are the current projection for 2019 costs

resulting from more gas-fired generation in conjunction with less coal-fired generation. Less coal-fired generation is being dispatched as a result of mothballs/retirements and market fundamentals.

Operating Reserves

Operating reserve costs at the end of September 2019 are $151.9 million, which is $69.3 million or 31 per cent lower than the year-to-date September 2019 forecast of $221.2 million. The cost of operating reserves is impacted by actual volumes, hourly pool prices and operating reserve prices. Operating reserve costs are projected to be $200.5 million for 2019.

The cost variance as of September 2019 is mainly attributable to lower pool prices, which are $58 per MWh or 5 per cent lower than the year-to-date September 2019 forecast of $61 per MWh, and as a result of lower volumes resulting from reduced import incentive and limited coal outages, both of which reduced price spikes. Operating reserves volumes to the end of September 2019 are 5,941 gigawatt hours, which is 55 gigawatt hours or 1 per cent lower than the September 2019 forecast volumes of 5,996 gigawatt hours.

In addition, pool price volatility in 2019 has contributed to fewer hours of prices exceeding $250/MWh compared to the 2019 forecast. The prices of operating reserves procured through the online exchange are indexed to the pool price. The changes to the average pool price do not result in proportional changes to the operating reserve costs as operating reserve costs are derived from the pool price and a premium or discount to the pool price.

Other Ancillary Service 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 such instances where procurements may not be feasible, through bilateral negotiations.

Other ancillary services costs at the end of September 2019 are $20.2 million, which is $12.2 million or 38 per cent lower than the year-to-date September forecast of $32.4 million.

Other Ancillary Services Costs ($ million) ~ by production year

	YTD September Actual	YTD September Forecast	YTD September Variance	2019 Projection	2019 Forecast
Load Shed Service for Imports	12.7	24.6	(11.9)	18.0	32.8
Contracted Transmission Must-run	2.1	2.4	(0.3)	3.1	3.2
Conscripted Transmission Must-run	0.4	0.2	0.1	0.4	0.2
Reliability Services	2.1	2.1	0.0	2.9	2.9
Poplar Hill	0.9	1.3	(0.4)	0.9	1.7
Black Start	1.7	1.7	(0.0)	2.3	2.3
Transmission Constraint Rebalancing	0.3	0.1	0.0	0.3	0.1
Other Ancillary Service Costs	20.2	32.4	(12.2)	27.8	43.2

Differences are 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). As of September 2019, LSSi costs are $12.7 million, which is $11.9 million or 48 per cent lower than the year-to-date September forecast of $24.6 million. This is due to lower LSSi utilization in 2019 than forecast due to lower import volumes than were anticipated. The lower import volumes result from lower import incentive driven by lower demand and limited coal outages, both of which limited price spikes.

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. A generator can be contracted to provide such services in an area or 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). For 2019 year-to-date, there have been more events requiring conscripted TMR than was anticipated in the 2019 forecast.

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 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 blackout, black start services are used to re-energize the transmission system and provide start-up power to generators who cannot self-start. The 2019 year-to-date and forecast reflect contract pricing for black start services.

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. There was one significant event in 2019.

Other Industry Costs

The following table provides other industry costs as of September 2019 compared to the forecast for the same period.

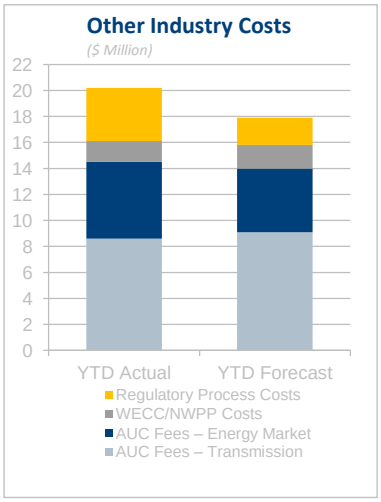
Year-to-Date September 2019 Other Industry Costs ($ million)

	YTD September Actual	YTD September Forecast	YTD September Variance	2019 Projection	2019 Forecast
AUC Fees – Transmission	8.6	9.1	(0.5)	11.5	12.2
AUC Fees – Energy Market	5.9	4.9	1.1	7.9	6.5
WECC/NWPP/NERC Costs	1.6	1.8	(0.2)	2.1	2.4
Regulatory Process Costs	4.1	2.1	1.9	4.3	2.8
Other Industry Costs	20.2	17.9	2.3	25.9	23.8

Differences are due to rounding

Other industry costs represent fees or costs paid based on regulatory requirements or membership fees for industry organizations. The amounts or requirement for the costs are not under the direct control of the AESO. These costs relate to the annual administration fee for the Alberta Utilities Commission (AUC); the

AESO's share of Western Electricity Coordinating Council (WECC), Northwest Power Pool (NWPP) and North America Electric Reliability Corporation (NERC) membership fees; and regulatory process costs.



Based on current estimates, it is anticipated that actual other industry costs in 2019 will be $25.9 million, which is $2.1 million or 9 per cent higher than the year-to-date September 2019 forecast of $23.8 million.

AUC fees at the end of September 2019 are $14.5 million, which is $0.5 million or 4 per cent higher than the year-to-date September forecast of $14.0 million.

The WECC/NWPP/NERC fees are projected to be slightly less than the 2019 forecast amount.

The 2019 cost projection for regulatory processes is $4.3 million, which is estimated to be $1.5 million higher than the 2019 budget. The 2019 projected costs are related to AESO's involvement in several significant regulatory proceeding in 2019 including: capacity market – provisional proceeding; 2018 ISO tariff proceeding; and various Need Identification Document (NID) proceedings.

General and Administrative Costs

The following table provides the general and administrative costs as of September 2019 compared to the budget for the same period.

Year-to-Date September 2019 General and Administrative Costs ($ million)

	YTD September Actual	YTD September Budget	YTD September Variance	2019 Projection	2019 Budget
Staff Costs	57.0	54.5	2.5	76.6	72.8
Contract Services and Consultants	4.0	8.6	(4.6)	6.1	11.5
Administration	3.0	3.5	(0.5)	4.0	4.5
Facilities	2.9	3.1	(0.2)	3.9	4.1
Computer Services and Maintenance	8.5	8.6	(0.1)	11.4	11.5
Telecommunications	1.2	1.1	0.0	1.5	1.5
General and Administrative Costs	76.6	79.5	(2.9)	103.6	106.0

Differences are due to rounding

Staff Costs

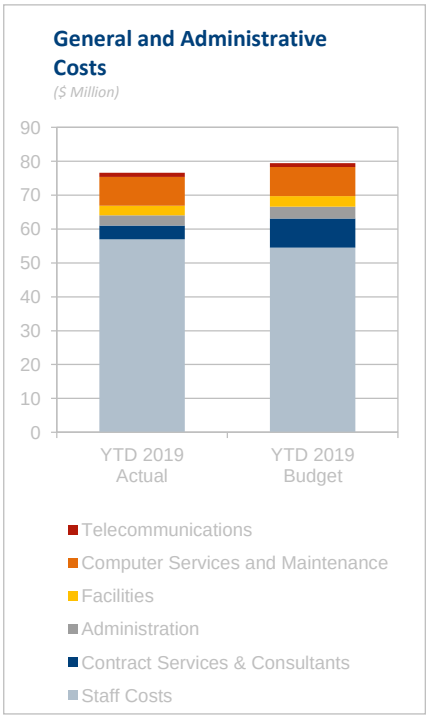
The AESO maintains market-based compensation for staff which incorporates a benefits plan and a performance-based incentive. Staff costs to September 2019 are $57.0 million, which is $2.5 million or 5 per cent higher than the year-to-date September 2019 budget of $54.5 million. Actual staff costs for 2019 are projected to be $3.8 million or 5 per cent higher than the 2019 budget. The increase is due to the conversion of consultants to staff positions through an initiative to retain knowledge and specialized talent within the AESO and to reduce overall costs as staff compensation is lower than the consulting related costs.

Contract Services and Consultants

The contract services and consultants costs to September 2019 are $4.0 million, which is $4.6 million or 53 per cent lower than the year-to-date September 2019 budget of $8.6 million. The amount is below budget due to the conversion of consultants to staff positions, as well as the cessation of the REP procurement and capacity market initiatives. Contract services and consultants costs for 2019 are projected to be $5.4 million or 47 per cent lower than the 2019 budget of $11.5 million.

Administration

Administration costs include travel and training, AESO Board fees, office costs, insurance and recruiting, which represent the general operating costs of the organization. Administrative costs to September 30, 2019 are $3.0 million, which is $0.5 million or 14 per cent lower than year-to-date September 2019 budget of $3.5 million. The lower costs are associated with cessation of the capacity market and anticipated costs related to market participant consultation activities. Administration costs for 2019 are projected to be $0.5 million or 11 per cent lower than the 2019 budget of $4.5 million.



Facilities

Facility costs include short-term leases and operating costs for three AESO locations. Facility costs to September 2019 are $2.9 million, which is $0.2 million or 6 per cent lower than the year-to-date September 2019 budget. The decrease is primarily due to the inclusion of operating costs for the completion of the AESO's SCC Expansion project on a straight line basis over the year in the budget, while the costs will not be incurred until Q4 when the facility was completed. Facilities costs are projected to be $0.2 million or 5 per cent lower than the 2019 budget of $4.1 million due to these factors.

Computer Services and Maintenance

Ongoing costs are incurred to purchase annual software operating licences and maintenance agreements for the AESO's information technology systems. Actual computer services and maintenance costs to September 30, 2019 are $8.5 million, which is $0.1 million or 1 per cent lower than the year-to-date September 2019 budget due to active management of contract and vendor costs. Computer services and maintenance costs for 2019 are projected to be $11.4 million, which is $0.1 million or less than 1 per cent lower than the 2019 budget of $11.5 million.

Telecommunications

The AESO incurs costs for network systems and telecommunications to support general business operations and, to a much larger extent, to support real-time operations. It is anticipated that these costs, based on current projections for 2019, will be consistent with the 2019 budget.

Interest and Amortization and Depreciation Costs

The following table provides the interest and amortization and depreciation costs as of September 2019 compared to the budget for the same period.

Year-to-Date September 2019 Costs ($ million)

	YTD September Actual	YTD September Budget	YTD September Variance	2019 Projection	2019 Budget
Interest	3.8	2.7	1.1	5.3	3.6
Amortization of Intangible Assets and Property, Depreciation of Plant and Equipment	28.9	15.9	13.0	35.4	21.2

Differences are due to rounding

Interest

Interest expense is incurred primarily as a result of bank debt held throughout the year and the associated borrowing rate. Bank debt is issued to fund intangible and capital asset purchases, prepayments of future expenses and working capital deficiencies due to timing differences in the collection of revenues and payment of expenses. Interest is also incurred through the amortization of right-of-use liabilities in accordance with IFRS 16. Interest costs to September 2019 are $3.8 million, which is $1.1 million or 41 per cent higher than the year-to-date September 2019 budget. The increase is due to working capital deficiencies and the effect of IFRS 16. Interest costs are projected to be $1.7 million or 47 per cent higher than the 2019 budget of $3.6 million due to these factors.

Amortization of Intangible Assets and Depreciation of Property, Plant and Equipment (PP&E)

Intangible assets are amortized and PP&E is depreciated over their estimated useful lives. Intangible assets include the AESO's computer software purchases and development. Amortization and depreciation is also incurred through the amortization of right-of-use assets in accordance with IFRS 16. Amortization and depreciation costs to September 2019 are $28.9 million, which is $13.0 million or 82 per cent higher than the year-to-date September 2019 budget. The increase is primarily due to the write-off of $10.7 million in capacity market assets that no longer hold future value for the AESO, as well as the effect of IFRS 16. Amortization and depreciation costs are projected to be $14.2 million or 67 per cent higher than the 2019 budget of $21.2 million due to these factors.

Capital Expenditures

The AESO has three main asset categories: people, technology and processes. While investment occurs in all three areas, only the technology assets (computer systems and System Coordination Centre) are the focus for capital expenditures, with a very small percentage being allocated to leasehold improvements. The development and acquisition of capital assets is a major budget component given the AESO's significant reliance on IT infrastructure and applications for business operations. As with all IT-intensive organizations, the challenge is to find the right balance between implementing technology

advancements, determining the level of IT development that can be supported by business operations and then establishing the funding requirements to make it all happen.

To address these challenges, a vetting and prioritization process has been implemented and continues to be enhanced to ensure capital expenditures achieve the most beneficial and cost-effective results to continue to meet operating requirements. This is referred to as the portfolio management process. Throughout the year, capital projects are reviewed on an ongoing basis to assess progress and budget spending and identify potential issues. Any new or modified requirements are also reviewed and prioritized to determine how they align with existing work. This is a continual process to ensure alignment of priorities and business needs.

The projection of capital expenditure is $44.3 million for 2019. The AESO's 2019 projected general capital budget of $32.7 million (key, other, life cycle) and is expected to be lower than AESO's approved general capital budget of $40.4 million for 2019.

Capital Expenditures ($ million)

	2019 YTD September Actual	**2019 Remaining**	**2019 Projection**
Key Capital Initiatives	15.8	4.4	20.3
Other Capital Initiatives	2.3	2.7	5.0
Life Cycle Funding	3.5	3.9	7.4
Major Project – System Coordination Centre Expansion	10.0	1.7	11.7
Total Capital Spending	31.7	12.6	44.3

Differences are due to rounding

Key Capital Initiatives represent the most critical capital projects over the planning period that must be completed within the identified timeframe.

Other Capital Initiatives are also necessary projects; however, there is more flexibility in planning or delivery so timing is not as critical as the Key Capital Initiatives.

Life Cycle Initiatives are typically replacement of end-of-life IT hardware and recurring software upgrades.

Major Project Initiatives are programs or projects that due to their size (generally single projects, greater than $1 million and multiple years in duration) cannot be managed within the general capital budget. These programs or projects require stakeholder consultation and AESO Board approval.

Appendix C: Transmission Operating Cost Definitions

2020 Pool Price Forecast Methodology

Consistent with the 2019 BRP, the AESO has chosen to use the EDC Associates' hourly pool price forecast for 2020. The hourly pool price forecast is used as an input to calculate the ancillary services and transmission line losses costs.

There are numerous variables and assumptions used in the hourly pool price forecast and it is understood that the following assumptions have been considered by EDC:

- recent market fundamentals;
- the impact of the Carbon Competitiveness Incentive Regulation (CCIR); and
- pricing impacts associated with retirements/mothballs, and Renewable Electricity Program (REP) Round 1 additions.

The 2020 average pool price is forecast to be $58 per MWh compared to the 2019 projected average pool price of $56, an increase of 4 per cent. The higher pool prices anticipated for 2020 are in part due to expected continued strategic offer behaviour by market participants and higher demand.

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 import) available to serve load, weather conditions, and changes in the transmission topology. System maintenance schedules, unexpected failures, dispatch decisions on the AIES, and short-term system measures (such as demand response) may also affect the volume of losses.

The annual volume forecast for transmission line losses is based on the hourly forecast losses volumes, which are based on:

- statistical models that use forecast load as an input; and
- normal weather.

The annual forecast for transmission line losses costs is the aggregate of the hourly forecast losses volumes multiplied by the hourly forecast pool prices. As such, the transmission line losses costs are highly correlated with the pool price forecast.

Ancillary Services

Ancillary services are procured by the AESO to ensure reliability of the transmission system and include operating reserves and services with generation capacity and load reduction capabilities. Ancillary services are procured through various methods including a daily competitive exchange for operating reserves and competitive processes that result in contracts for other types of ancillary services.

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. The procurement of operating reserve volumes is directly correlated to load and generation. Operating reserves are procured through an online, day-ahead exchange. In exchange for this payment, the AESO obtains the right to utilize the provider's energy and/or capacity as reserves. Over-the-counter contracts are used only as a back-up to procure operating reserves in the absence of the availability of the online exchange. All providers who sell volumes over-the-counter are paid their offer price.

Categories of Operating Reserves

Active operating reserves:

- required to automatically balance small changes in supply and demand
- required to maintain system reliability during unplanned events such as the loss of a generator, loss of a transmission line, or a sudden increase in demand
- Alberta Reliability Standards (ARS) define the minimum levels that must be procured
- costs are the product of volumes procured multiplied by operating reserve price, which is indexed to the hourly pool price
- represent approximately 80 per cent of total operating reserves costs
- costs are impacted by pool price fluctuations, supply of offered reserves and market participant offer behaviour

Standby operating reserves:

- provide additional reserves when the active operating reserves are insufficient to ensure system reliability
- pricing includes two components: i) an option premium, paid for the capability to activate the standby reserves; and ii) an activation price, paid only if the standby reserves are activated
- represent approximately 20 per cent of total operating reserves costs

Operating Reserve Products (in both the active and standby markets)

1) **Regulating reserves** – The generation capacity, energy and maneuverability responsive to the AESO's automatic generation control (AGC) system that is required to automatically balance supply and demand on a minute-to-minute basis in real time.

2) **Spinning reserves** – Unloaded generation that is synchronized to the transmission system, automatically responsive to frequency deviation and ready to provide additional energy in response to an AESO System Controller directive. Spinning reserve suppliers must be able to ramp up their generator within 10 minutes of receiving a System Controller directive.

3) **Supplemental reserves** – While similar to spinning reserves, supplemental reserves are not required to respond to frequency deviations. They include unloaded generation, off-line generation or system load that is ready to serve additional energy (generator) or reduce energy (load) within 10 minutes of receiving a System Controller directive.

Other Ancillary Services

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 such instances where such procurements may not be feasible, through bilateral negotiations.

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).

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 blackout, 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 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). In the event of foreseeable TMR, the AESO may enter into a contract with a generator to provide TMR services.

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

Reliability services are provided through an agreement with Powerex Corp. for grid restoration balancing support in the event of an Alberta blackout, and for emergency energy in the event of supply shortfall.

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 ISO Rules and would receive a transmission constraint rebalancing payment for energy provided for that purpose.

Appendix D: 2020 General and Administrative Cost Detail

Staff, Contract Services and Consultants

Staff, Contract Services and Consultants ($ million)

	2020 Budget	2019 Budget	2018 Actual	2017 Actual
Staff	**66.7**	72.8	74.3	67.3
Consulting	**6.6**	10.0	10.8	10.7
Legal	**0.7**	1.4	1.2	2.5
Audit	**0.1**	0.1	0.1	0.1
Staff, Contract Services and Consultants	**74.0**	84.3	86.4	80.6

Differences are due to rounding

Staff Costs – These costs are based on several key budget variables or factors:

Base pay for performance adjustments for existing staff or an overall change in the AESO's compensation philosophy - The AESO continues to review the general economic indicators and salary survey information to determine the impact on employee compensation. An amount of $1.0 million has been reflected in the 2020 budget for this purpose. No base salary adjustment is proposed for 2020. There were no base salary pay adjustments in 2016, 2017, 2018 and 2019, although an amount of $1.0 million and $1.2 million for 2018 and 2019, respectively, was approved to adjust employee compensation that was considered out of alignment with the market.

Short-term (annual) incentive plan - The AESO's short-term incentive plan is based on an assessment of corporate and individual performance, as aligned to corporate goals. In preparing the budget for 2020, the AESO has confidence in its approach to successfully deliver on its goals and has reflected this in its incentive compensation at a per cent of one's eligibility, which is consistent with prior years.

Vacancy rate - The AESO has included a 6 per cent vacancy rate for 2020, which is lower than the prior year budgeted vacancy rate of 8 per cent. Combined with no forecast staff increases for the 2020 budget year and historical trends, AESO Management feels this is more representative of the AESO's vacancy rate for 2020.

Benefit costs - In addition to their salary, each employee participates in the organization's comprehensive benefit plan. This represents costs such as health and dental coverage, defined contributions for retirement savings and federal payroll taxes. These costs are presented as a percentage of salary costs to determine a "benefits load factor", budgeted at 22 per cent, which is consistent with prior years.

Consulting - The AESO hires consultants to supplement staff resources for two general purposes. It is not practical to permanently retain staff with specific skill sets that may only be required for certain initiatives. In these circumstances, consultants are utilized to either complete the work or assist in training AESO staff. Consultants are also used to address workload peaks to maintain seamless operations and continual progression on key initiatives. Reductions in consulting costs for the 2020 budget reflect a decreased need for specialized skills related to the REP and capacity market key initiatives.

Legal – Legal counsel is retained to support general business operations by supplementing in-house legal resources and to provide expertise on regulatory filings and more complex commercial matters. Costs associated with the AESO's involvement in an AUC proceeding to hear objections and complaints to ISO Rules or any regulatory application are included in the cost category regulatory process costs, as opposed to the general and administrative cost category. Reductions in legal costs for the 2020 budget reflect a decrease in AUC proceedings and commercial matters pertaining to the REP and capacity market key initiatives.

Audit/Review – To conduct audits or reviews on AESO processes, systems or reporting, the professional services of third parties are used to assist with these initiatives.

Administration

Administration ($ million)

	2020 Budget	2019 Budget	2018 Actual	2017 Actual
Travel and Training	**1.8**	1.9	1.5	1.4
Insurance	**0.6**	0.5	0.5	0.5
AESO Board Fees	**0.5**	0.5	0.5	0.5
Other Administrative	**1.9**	1.6	1.9	1.5
Administration	**4.8**	4.5	4.4	3.9

Differences are due to rounding

Travel and Training – The travel and training category covers costs incurred for general business travel, staff training and associated travel, corporate meetings and related meals, including costs related to stakeholder consultation sessions. The budgeted costs in 2020 have decreased by $0.1 million from 2019 due to removal of training and costs related primarily to the capacity market implementation costs in 2019. Remaining costs are consistent with prior year and are associated with annual provincial system restoration training, participation in NWPP, WECC and Reliability Coordinator (RC) to RC Operating Committees, normal operations activities, and training and market participant consultation costs related to various AESO initiatives.

Insurance – The *Electric Utilities Act* (EUA) provides limited statutory protection for the business risks of the AESO organization, directors, officers and staff. To ensure business risks are properly insured, the AESO carries insurance for exposures not covered by the EUA, specifically for direct damages resulting from negligence. The AESO has statutory protection for indirect damages, which would typically be the most costly damages that would occur for business interruption and lost revenue. A $0.1 million increase is forecast for 2020 due to premium increases and the consideration of additional insurance coverages.

AESO Board Member Fees – The AESO is governed by the AESO Board whose members are appointed by the Alberta Minister of Energy. While the number of Board members can vary from time to time, there can be no more than nine members, with their compensation based on a retainer fee and additional fees based on their Board committee involvement and time spent on corporate matters.

Other Administrative Costs – This category includes corporate subscriptions/memberships and professional membership fees, general office costs, printing and recruiting. An increase of $0.3 million is forecast for 2020 compared to 2019 primarily related to additional office costs due to completion of AESO's SCC Expansion project in Q4 2019; increased corporate relations activities; and recruiting costs to assist with specialized talent.

Facilities

Facilities ($ million)

	2020 Budget	2019 Budget	2018 Actual	2017 Actual
Rent	**0.0**	0.1	3.8	3.7
Operating Costs	**4.2**	4.0	3.8	3.2
Facilities	**4.3**	4.1	7.6	6.9

Differences are due to rounding

Facility costs are associated with three office locations: i) the main offices in downtown Calgary which are leased through long-term lease arrangements, ii) the SCC, which is owned and operated by the AESO, and iii) additional space for the AESO's Back-Up Coordination Centre to accommodate redundant computer systems to support seamless operating performance in the event of a disruption to the operations at the SCC.

To accommodate staff and contract resources in the main offices, 105,000 square feet of office space is currently leased through agreements that will expire in 2024. Due to their long-term nature, these leases are classified as right-of-use assets and corresponding right-of-use liabilities in accordance with IFRS 16. Amortization of the right-of-use assets is captured as amortization of intangible assets, with interest related to the time value of money captured as interest cost. Short-term and immaterial leases remain classified as rent.

An additional 12,000 square feet of office space was subleased in 2018 by the AESO to accommodate additional staff and contract resources required for AESO business initiatives. The sublease was renewed through April 2020 and is included in rent due to its short-term nature.

Operating costs are anticipated to increase as a result of rate increases and the inclusion of operating costs in the 2020 budget as a result of the completion of the AESO SCC Expansion project in 2019.

Computer Services and Maintenance

Computer Services and Maintenance ($ million)

	2020 Budget	2019 Budget	2018 Actual	2017 Actual
IT Maintenance and Services	**11.6**	11.5	11.2	10.2

As the AESO continues to invest in IT infrastructure to support its business operations, ongoing costs are incurred to purchase annual software and hardware operating licences and maintenance agreements for these systems with high availability requirements supported by appropriate class maintenance and support agreements. The AESO operates with a managed services model[13] for IT infrastructure operating support (e.g., network, server and database).

[13] A managed service model is where the AESO transfers the day-to-day management and operations of a support function (not the strategic management) to a third-party provider. With this support approach the AESO is able to leverage available technical resources and tools to provide more effective support for its critical processes. The managed services approach will facilitate resource efficiencies and improve reliability.

These costs are anticipated to increase by less than 1 per cent in 2020 over 2019 as a result of continued growth of required licenses, subscriptions and maintenance costs for new applications, and as a result of higher vendor costs from inflation adjustments for licenses and contracted costs. These factors are actively managed and offset through contract negotiations and vendor selection.

Telecommunications

Telecommunications ($ million)

	2020 Budget	2019 Budget	2018 Actual	2017 Actual
Telecommunications	**1.5**	1.5	1.5	1.4

The AESO incurs costs for network systems and telecommunications to support general business operations and, to a much larger extent, to support real-time operations. The strategy for developing and maintaining the telecommunication infrastructure is based upon the requirement for high availability, which necessitates redundancies of services and equipment. The 2020 budgeted costs are consistent with prior year amounts.

Appendix E: 2020 Capital Projects

The following tables provide information on the AESO's current capital plan for 2020. Actual projects to be completed during this period will vary, and include the addition of projects yet to be determined, deferral of projects in this plan, or elimination of projects deemed no longer necessary.

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	Continue implementation of EMS core upgrade to maintain sustainability of the EMS system Initiate design and implementation of EMS application upgrade to advance the application layer of EMS to support reliability and operation of market and electric systems
Critical Infrastructure Protection (CIP)	**Description**	Optimize the AESO Critical Infrastructure Protection (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.
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
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, as required to be determined in 2020

Key Capital Initiatives		
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
Key Initiatives	**2020 Budget $13.5 million**	

Other Capital Initiatives and Facilities ($ million)

These are necessary projects that have more flexibility in planning or delivery so timing is not as critical as the Key Capital Initiatives.

Other Capital Initiatives	Description	2020 Budget
Business Technology Solutions	Implementation of technology solutions to improve operating effectiveness, efficiency and controls – includes the AESO's human resources system, forecasting software, records management, contract management and financial reporting systems	5.0
Reliability - Other	Upgrades to existing SCC, Back-Up Coordination Centre and control room systems, technologies and energy storage	2.5
System Enhancement Program	Ongoing high priority minor enhancements to production applications	1.4
Other Capital Initiatives		**8.9**
Facilities	Life cycle replacement of chillers as well as generator and switchgear control system at the SCC. Also includes office furniture purchase, replacement and other leasehold improvements	**2.1**

Differences are due to rounding

Life Cycle Initiatives ($ million)

These are typically replacement of end-of-life hardware and recurring software upgrades.

Life Cycle Initiatives	Description	2020 Budget
Network Upgrades	Upgrade AESO voice and data networks to ensure vendor support, meet reliability requirements and address increased capacity needs. This includes data switches, remote access capabilities, and redundancy of critical network services	0.9
Server Upgrades	Retire and replace corporate server hardware/software based on a pre-determined corporate retirement plan. Priority replacements include critical database servers and servers within the development environment	0.7
Enterprise Services	Upgrades to the AESO critical middleware platforms to provide for a reliable, performant and vendor-supported environment	0.9
End User Computing	Upgrade activities that keep the end user computing platform current	0.1
Life Cycle TIBCO Upgrade	As a key integration tool for AESO's critical business applications, components within the TIBCO product set require an upgrade to address both end-of-support life as well as a current cyber-security risk	0.6
Storage Upgrade	Implement selected storage infrastructure upgrades to address existing end-of-life cycle considerations	0.4
Applications Life Cycle	Upgrades to the underlying technologies that support the AESO's corporate and enterprise applications	0.5
Non-project Capital	Ongoing investment in deskside systems, productivity tools, services and mobile devices to replace aging software and equipment and accommodate resource growth (e.g., data storage)	0.4
Application Server Modernization	Upgrade or replace the application server utilized in some of the business applications	0.4
Life Cycle Initiatives		**4.9**

Differences are due to rounding

Appendix F: Major Projects

No major projects are budgeted or planned for 2020.

Appendix G: Allocation of Costs

Management reviews allocation percentages twice a year. The percentages are reviewed when the annual budget is prepared and at year-end when the allocations are finalized based on actual activities and costs for each department.

Cost Type	Allocation Methodology
Direct Operating	Individual department review/analysis for current year work focus
Shared Services – Corporate Services[14]	Based on allocation of direct operating group costs
Shared Services – Information Technology	Activity-based analysis on system and resource costs
Shared Services – Office Leases	Based on AESO staff count
Capital	Assigned on a project-by-project basis
Other Industry Costs – Fees and Memberships	Based on related function
Other Industry Costs – Regulatory Process Costs	Individual review/assessment for each proceeding

[14] Corporate Services includes departments such as: Accounting, Settlement and Credit, Human Resources, Corporate Communications, Legal, etc.

Appendix H: Budget Amendments

As part of the established BRP process, should an unplanned funding requirement be identified during the budget period and a material budget amendment required, management will proceed following the steps outlined in the following table.

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 will review the new funding requirements with stakeholders, followed by a request for approval from the AESO Board
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 per cent of budgeted general and administrative expenditures • Less than 20 per cent of budgeted capital	

Stakeholder Comments and AESO Responses

Throughout the current year Budget Review Process (BRP), the AESO held meetings with stakeholders to discuss the business plan, budget and forecast materials and provided stakeholders with an opportunity to provide comments on this information.

The following table lists the companies that participated in the current year BRP and the meeting dates they attended.

Stakeholders in the Budget Review Process		October 30 Business Initiatives	November 29 Budget/ Forecast
Alberta Direct Connects (ADC)	Attendance	√	√
Best Consulting Solutions Inc.	Attendance	√	√
Capital Power Corporation	Attendance	√	√
ENMAX Corporation	Attendance	√	√
Heartland Generation Ltd.	Attendance	√	√
Independent Power Producers Society of Alberta (IPPSA)	Attendance	√	√
Industrial Power Consumers Association of Alberta (IPCAA)	Attendance	√	√
TransAlta Corporation	Attendance	√	√
Utilities Consumer Advocate (UCA)	Attendance		√

The following table identifies the key BRP dates in 2019 and 2020.

Key BRP Dates	Purpose
September 30, 2019	Notice to stakeholders – A notice was distributed to stakeholders regarding the initiation of the BRP (i.e., stakeholder consultation process), an overview of the process steps, terms of reference, and proposed process schedule.
October 30, 2019	First stakeholder meeting – Stakeholder meeting to discuss the preliminary list of business initiatives proposed for 2020.
November 29, 2019	Second stakeholder meeting – A technical review meeting to discuss transmission line losses and ancillary services costs forecasts for 2020 and the preliminary own costs budgets (general and administrative and capital) proposed for 2020.
February 10, 2020	Stakeholder and AESO Board meetings (as required).

Following stakeholder meetings and/or the posting of BRP information on the AESO's website, we asked stakeholders for their comments. Stakeholder comments and AESO responses to those comments are enclosed.

AESO Consultation –2020 Budget Review Process (2020 BRP), Invitation to Stakeholders and Supporting Material

September 30, 2019

The AESO has asked market participants and interested parties to participate in the AESO's consultation regarding its 2020 Business Plan and Budget. Related stakeholder comments regarding the invitation and supporting material are provided in the following matrix. The matrix also includes AESO management's response to the stakeholder comments.

Alberta Electric System Operator

Calgary Place, 2500, 330-5th Avenue SW Calgary, AB T2P 0L4

Phone: 403-539-2450 | Fax: 403-539-2949

www.aeso.ca

@theaeso

Invitation to Participate
Do stakeholders accept the invitation to participate in the 2020 BRP?
Alberta Direct Connect ("ADC") ADC accepts the invitation to participate. **Best Consulting Solutions Inc. ("Best")** I would like to participate in the process and have no comments on the materials posted. **Capital Power Corporation ("Capital Power")** Capital Power accepts the invitation to participate in the AESO's 2020 BRP. **ENMAX Corporation ("ENMAX")** Yes, ENMAX would like to actively participate in the process and requests the opportunity to be made aware of any developments relating to the AESO's 2020 Budget Review Process. **Heartland Generation Ltd. ("Heartland")** Heartland accepts the invitation to participate in the 2020 BRP. **Independent Power Producers Society of Alberta ("IPPSA")** IPPSA wishes to participate in the 2020 BRP and appreciates the opportunity to do so. Our principal interest is to see the AESO lower its own costs and therefore trading charge. **Industrial Power Consumers Association of Alberta ("IPCAA")** Yes. **TransAlta Corporation ("TransAlta")** TransAlta accepts the invitation to participate in the 2020 BRP. **AESO Response** **Comments noted. The Alberta Electric System Operator (AESO) thanks stakeholders for their participation, commitment and support of the process.**

Terms of Reference
Do stakeholders agree with or have comments on the principles set out in the Terms of Reference?

ADC

ADC agrees with the principles set out in the terms of reference.

AESO Response

Comment noted.

Capital Power

Capital Power has no comments at this time.

AESO Response

Comment noted.

ENMAX

ENMAX has no issues with the comments and principles set out in the Terms of Reference at this time.

AESO Response

Comment noted.

Heartland

The fifth bullet point indicates that "stakeholders will have the opportunity to comment on each other's comments". However, Heartland does not see where this step is indicated in the proposed process or calendar. The AESO should indicate when this opportunity to comment will occur and whether it will be in writing or in-person. If this opportunity to comment occurs after the AESO posts its replies to comments, then there should be a step whereby the AESO will reply to the second phase of comments.

AESO Response

Comments noted. Stakeholders will have an opportunity to discuss other stakeholder's comments in addition to their own comments at various times during the process. Specifically, during Step 5 of the BRP, *Stakeholders make oral or written presentations to the AESO Board on issues of disagreement or concern (multi-lateral) based on comments submitted in one of the earlier steps*. Stakeholders may submit written presentations after the stakeholder comments on the business initiatives and forecasts and own costs have been published earlier in the process. Also, stakeholders may provide comments on other stakeholder's comments regarding the business initiatives when they submit their comments on the AESO's forecasts and own costs.

IPPSA

IPPSA finds the Terms of Reference to be generally acceptable. IPPSA members may provide their own comments.

AESO Response

Comment noted.

IPCAA

Yes – agree. No comments at this time.

AESO Response

Comment noted.

TransAlta

We agree with the principles set out in the terms of reference.

AESO Response

Comment noted.

Process Steps
Do stakeholders agree with or have comments on the steps identified in the 2020 BRP?
ADC ADC supports the steps outlined in the 2020 BRP. **AESO Response** **Comment noted.** **Capital Power** Capital Power has no comments at this time. **AESO Response** **Comment noted.** **ENMAX** ENMAX has no issues or comments on the steps identified in the 2020 BRP at this time. **AESO Response** **Comment noted.** **Heartland** The steps identified by the AESO seem appropriate for the 2020 BRP. **AESO Response** **Comment noted.** **IPPSA** IPPSA finds the steps proposed for the 2020 BRP to be acceptable. IPPSA members may provide their own comments. **AESO Response** **Comment noted.** **IPCAA** Yes – agree. No comments at this time. **AESO Response** **Comment noted.**

TransAlta

We generally agree with the process steps. As a matter of efficiency, we see no clear reason why steps 2 and 3 could not be done concurrently (the development of strategies and business initiatives is not directly tied to ancillary services and transmission line loss cost forecasts).

AESO Response

Comments noted. The AESO develops the business initiatives and the AESO own cost budget in a somewhat iterative manner. Presenting the business initiatives in advance of the AESO own cost budget allows the AESO time to assess stakeholder feedback provided on the AESO's proposed business initiatives and then determine any impact on the AESO's proposed own cost budget. The ancillary services and wires, transmission line loss cost forecasts are provided at the same time as the AESO own cost budget to provide a complete picture of the AESO's costs in one meeting.

Calendar and Schedule

Do stakeholders agree with the proposed BRP stakeholder calendar? Are there any comments regarding the meetings scheduled?

ADC

ADC can participate in the scheduled meetings if there is a teleconference/videoconference option.

AESO Response

Comment noted. The AESO will provide teleconferencing for the meetings.

Capital Power

It is not clear in the proposed BRP stakeholder calendar if materials for the Business Initiatives (Oct 30th) and Technical Meetings (November 29th) will be distributed in advance. To allow stakeholders an adequate amount of time to review and prepare for meaningful discussion with the AESO, Capital Power encourages the AESO to distribute materials a week prior to the scheduled meetings. The AESO's 2017-2018 BRP stakeholder calendar included material distribution dates and continuance of this practice aligns with the BRP Terms of Reference wherein it states that "the AESO will endeavor to provide as much information as is reasonably possible to ensure stakeholders have all information relevant to the subject matters under review".

AESO Response

As in previous years, the AESO will endeavor to distribute the materials in advance of the meetings.

ENMAX

ENMAX has no issues or comments on the proposed BRP stakeholder calendar at this time.

AESO Response

Comment noted.

Heartland

Within step 3.0 the AESO provides documents to stakeholders in advance of holding a technical meeting, however this activity does not have a proposed date on the calendar. Heartland suggests that the publication of these documents could be combined with the web posting of comments and replies regarding Business Initiatives on November 22, 2019. This would allow stakeholders 5 business days to review the material prior to the technical meeting held on November 29, 2019.

Heartland proposes that the opportunity to comment on other stakeholder's comments should be included in the BRP stakeholder calendar to align with the BRP Terms of Reference.

AESO Response

Comment noted. See response to Capital Power's comment above and the response to Heartland's comment in the "Terms of Reference" section on page 3 of this document.

IPPSA

IPPSA finds the BRP calendar generally acceptable. IPPSA members may provide their own comments.

AESO Response

Comment noted.

IPCAA

IPCAA has no immediate concerns with the proposed calendar.

AESO Response

Comment noted.

TransAlta

We generally agree that the BRP stakeholder calendar is reasonable. While we recognize that the 2020 budget process was delayed due to unexpected circumstances (the cancellation of the capacity market), we believe that the most desirable practice is to ensure the budget is approved before the start of the applicable year. Our agreement with the proposed schedule should not be interpreted as a general acceptance of a budgeting practice that approves budgets after the start of the budget year.

AESO Response

Comments noted. Agreed, the most desirable practice is to ensure the budget is approved before the start of the applicable year.

Other Comments
Do stakeholders have any other comments to offer at this time?

ADC

ADC appreciates the opportunity to participate in the process.

Capital Power

Capital Power appreciates the opportunity to participate in the BRP Process.

ENMAX

-

Heartland

Heartland does not have any further comments to offer at this time.

IPPSA

IPPSA has no further comment at this time.

IPCAA

N/A

TransAlta

No comments at this time.

AESO Response

Comments noted.

Stakeholder Comment and AESO Replies Matrix

AESO Consultation –2020 Budget Review Process (2020 BRP), AESO's 2020 Business Initiatives

November 28, 2019

The AESO has asked market participants and interested parties to comment on the Preliminary List of 2020 Business Initiatives presentation given at the Budget Review Process (BRP) stakeholder review meeting on October 30, 2019. Related stakeholder comments regarding the business initiatives are provided in the following matrix. The matrix also includes AESO management's response to stakeholder comments.

Alberta Electric System Operator

Calgary Place, 2500, 330-5th Avenue SW Calgary, AB T2P 0L4

Phone: 403-539-2450 | Fax: 403-539-2949

www.aeso.ca

@theaeso

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?
Alberta Direct Connect ("ADC") **Comment 1** Market Sustainability and Evolution: The ADC supports the efforts to move to a shorter settlement interval. **AESO Response** **Comment 1** Comment Noted.
Alberta Direct Connect ("ADC") **Comment 2** Tariff: The ADC supports the efforts to move forward with the DTS tariff redesign and wants to ensure the AESO has adequate resources to fully examine any changes. **AESO Response** **Comment 2** Comment Noted. The AESO intends to use adequate resources to fully examine any changes.
Alberta Direct Connect ("ADC") **Comment 3** People and Culture: ADC encourages the AESO to comment on the expected deliverables of the cultural evolution initiative in terms of productivity gains and costs. **AESO Response** **Comment 3** Comment Noted. The expected deliverables are aimed at preparing the organization for exponential technology changes that are disruptive through the electricity value chain. In that way the organization can continue to successfully deliver on its mandate through industry transformation due to improved processes and increased capabilities. The culture shift also assists in attracting and retaining talent, thereby managing recruitment, on-boarding and training costs. The organization already assumed significant cost savings through workforce reductions that impact the 2020 budget.

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?
Alberta Direct Connect ("ADC") **Comment 4** Settlement Audit: ADC supports the settlement audit initiative. **AESO Response** **Comment 4** Comment Noted. The first phase of the initiative will be to assess if the controls are in place (readiness assessment). The second phase of the initiative will be to test the effectiveness of the controls over a period of time. The start of the second phase will depend on the readiness assessment and any mitigation required. **Alberta Direct Connect ("ADC")** **Comment 5** Productivity: ADC supports the development of business cases to support elements of the technology program. It is important to demonstrate projects are delivering value for consumers. **AESO Response** **Comment 5** Comment Noted. All capital projects initiated by the AESO are reviewed and approved through the portfolio management process. This process is led by senior management and facilitates a regular review and prioritization of major projects to ensure business requirements are met and, at the same time, achieve the most beneficial and cost-effective results. This process also allows for the flexibility to re-evaluate capital plans throughout the year. Business case reviews and approval are part of the portfolio management process. **Capital Power Corporation ("Capital Power")** **Comment 1** Capital Power appreciates the opportunity to provide feedback to the AESO on the 2020 Budget Review Process ("2020 BRP") and submits the following comments for consideration. Capital Power submits that stakeholders require a comprehensive overview of the budget, priority, and schedule of the initiatives identified by the AESO in order to adequately comment on the Budget Review Process. The AESO's material provided to date lacks sufficient detail in these respects to assess whether the budget is appropriate, or whether the AESO is focused on initiatives that reflect the priority of stakeholders and the market. The AESO-administered markets have been affected by significant changes in policy over the past several years, during which the AESO budget and associated pool trading charge have increased materially. In the current circumstances, where the market is again facing significant policy change, it is appropriate to undertake a complete review of the AESO budget to ensure it meets the long-term requirements of the market. In undertaking this budget review, it is also necessary to consider how the AESO identifies priorities for the organization. Capital Power submits that the AESO should consider alternative forums to seek feedback and advise on priorities for the organization, including priorities that will form part of the budget review process. This should include initiation and/or assessment of near-term and long-term projects needed to support efficient operation of the wholesale market. As noted, additional detail is needed to provide informed comments on the proposed initiatives identified by the AESO. Capital Power notes the following issues with specific initiatives listed by the AESO in the material from the stakeholder session on October 30.

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

AESO Response

Comment 1

Comment Noted. Stakeholders will have an opportunity to see the related budgets during the November 29, 2019 meeting on the 2020 AESO Forecast and Own Costs. The Business Initiatives that involve stakeholder participation have their own processes which will provide timelines as available whereas the BRP is providing a high-level perspective of all of the Business Initiatives for general AESO budget planning purposes and alignment.

Capital Power Corporation ("Capital Power")

Comment 2

Market Sustainability & Evolution

In establishing the process to review long-term market sustainability through a supply adequacy assessment, it would benefit stakeholders to have a greater understanding of the scope of this exercise. Capital Power requests that more detail on the scope, timelines, and methods be provided to allow stakeholders the ability to fully assess the reasonableness of the anticipated budget associated with this work.

As it relates to the AESO's preliminary scope of the flexibility initiatives, Capital Power understands that it relied on the Net Demand Variability Study that was completed as part of the capacity market design process. Within this study, assumptions relating to renewable builds – a key driver of net demand variability – incorporated data that reflected the full implementation of the Renewable Energy Program. Capital Power, therefore, submits that a review of this study is warranted given the change in policy. Thereafter, it may be appropriate to review the necessity of certain aspects of the scope as it is currently contemplated.

AESO Response

Comment 2

Comment Noted. The AESO will be providing additional information to stakeholders regarding scope, timelines and engagement process before end of 2019 on the market sustainability assessment. The AESO will be updating its Net Demand Variability Study with updated inputs that reflect current expectations for renewables.

Capital Power Corporation ("Capital Power")

Comment 3

Long-Term System Developments

The AESO notes the 2020 initiatives for transmission will include AUC approval processes for system projects needed to enable generation included in the 2020 Long Term Plan. Capital Power submits that greater scrutiny is needed to ensure only essential projects are being pursued, and that transmission development supports a realistic level of future development. Further, clear articulation of the cost-benefits analysis for each project should be transparent and project milestones must be tied to committed future development. For projects that are deemed to be essential, the AESO should determine whether alternative procurement processes are appropriate for any new development.

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

AESO Response

Comment 3

Comment Noted. The AESO has the objective of optimizing the transmission system infrastructure. A focus of the Long Term Plan development strategy is to ensure that the transmission plan is flexible and adaptable to a wide variety of potential future scenarios. The focus also includes efficient use of the existing transmission system with timely addition of necessary new transmission developments. The AESO has provided a description of its transmission system planning process, including need assessment, in the AESO 2017 Long-term Transmission Plan (see section 3 Transmission planning and developments).

Capital Power Corporation ("Capital Power")

Comment 4

Grid Market Operations System

In advancing projects under the Grid Market Operations System initiative, it is essential to provide stakeholders with advanced notice of any changes that stand to impact market participants' information systems and electronic interfaces with AESO systems. With any long lead time items, stakeholders require time to make consequential adjustments to internal systems to ensure seamless integration with updates or system improvements at the AESO.

AESO Response

Comment 4

Comment Noted. Agreed, it is essential to provide stakeholders with advance notice of any changes that stand to impact market participants' information systems and electronic interfaces with AESO systems.

ENMAX Corporation ("ENMAX")

Comment 1

ENMAX does not have any comments on the proposed AESO's Business Initiatives for 2020 at this time. We reserve our comments until the costs associated with the proposed initiatives have been provided. The transparency of these costs and how they relate to the specific initiative is integral to understanding the relevance and appropriateness of the costs. We request as part of the description of the costs, the AESO provide clarity on which projects are multi-year and which years specifically the bulk of the costs will be allocated to.

AESO Response

Comment 1

Comment Noted. Please see AESO response to Heartland Comment 1, below. Also, the AESO will provide additional information on Capital and G&A at the November 29th stakeholder meeting on AESO's Own Costs. However, the AESO does not allocate its G&A costs by business initiative. Additionally, the AESO has other core or baseload work that is not part of the business initiatives. All of the business initiatives are multi-year or have the potential to be multi-year with the exception of the Stakeholder Engagement Framework. Many of the 2020 proposed Business Initiatives are at the first year or early in their design and implementation.

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

Heartland Generation Ltd. ("Heartland")

Comment 1

In general, the AESO does not rank the priority of the different business initiatives shown in the presentation. It would help for the AESO to clarify which projects it will focus on of those proposed. The AESO and market participants should agree on the relative importance of the proposed initiatives. To improve the list of proposed business initiatives, the AESO should include priority, expected scope, and anticipated cost. This cost estimate should include the fees of all the consultants retained by the AESO.

Heartland Generation Ltd. (HGL) would also like to know how the proposed multi-year initiatives will drive the AESO's costs in 2020. It is important to differentiate the costs of the initiative over multiple years and the costs expected to be incurred in the target budget year (2020). Furthermore, it would help if the AESO could provide high-level timelines for initiatives, especially those in which it expects to involve stakeholders. This would allow for better planning and stakeholder coordination. For example, if a large consultation is expected to run from April to June of 2020, doing so would allow stakeholders to plan their personnel and resources accordingly to better participate in the process, resulting in improved outcomes for the AESO and, by extension, the market. In addition, HGL has additional comments on the following topics:

AESO Response

Comment 1

Comment Noted. Please refer to AESO Response to ENMAX Comment 1, above. Also, all of the Business Initiatives work is deemed to be important and form the basis of the AESO's organizational direction for 2020 and thus are not ranked. However, some of the Business Initiatives are mandated whereas some of have been identified by the AESO to add value for its stakeholders. The AESO allocates resources to ensure the identified work for 2020 in each initiative can be managed successfully while minimizing cost.

The 2020 Budget Process is as follows: AESO prepares its Own Cost budget based on the business planned for the budget year. Assessments of required resources both internally and externally are evaluated on various criteria. These criteria include, but are not limited to: resource requirements to deliver on key business initiatives; consideration of specialized knowledge, skills or cost effective resources; and resource constraints due to workflow and timing of initiatives; and risk mitigation requirements.

Subsequent to Government of Alberta (GoA) decision to not continue with the REP and Capacity Market initiatives, AESO Management undertook a detailed review of its resources (staff and consulting). Department and individual staff positions were reviewed to assess if excess capacity existed from the GoA decision. In addition, a high level assessment was undertaken of the AESO's organizational structure to identify opportunities for efficiencies and how the AESO should be structured going forward to achieve its objectives (e.g. operations and transmission departments were combined to form grid reliability). As a part of Management's review, resources were assessed to determine if they were adequate, on an overall basis, to deliver on the AESO's base business and initiatives for 2020

The Business Initiatives that involve stakeholder participation have their own processes which will provide timelines as available whereas the BRP is providing a high-level perspective of all of the Business Initiatives for general AESO budget planning purposes and alignment.

Heartland Generation Ltd. ("Heartland")

Comment 2

Market Sustainability & Evolution: The AESO indicated that it will continue with the "flexibility initiatives including implementation of the dispatch tolerance and ramp rate rule changes." Stakeholder consultation would be an invaluable resource on this issue as the AESO continually tests its assumptions and expectations; the AESO should consult on an updated net-demand variability study or similar studies that support the assertion that these issues require market rule changes. Further to the point above regarding timelines, the AESO should indicate the timelines for this initiative so that stakeholders can resource accordingly.

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

AESO Response

Comment Noted. Please refer to the AESO Response to Capital Power Comment 2, above.

Heartland Generation Ltd. ("Heartland")

Comment 3

Tariff, Review of bulk and regional transmission rate design: Further to the point above regarding priorities, it would be prudent for the AESO to indicate that this is one of the largest priorities (ahead of incremental market changes). Transmission rate design has the greatest impact on electricity consumers and the efficiency of the market, especially since transmission costs will remain a significant portion of consumer bills over the next decade.[1]

AESO Response

Comment 3

Comment Noted. It is an initiative the AESO is focusing on in 2020.

Heartland Generation Ltd. ("Heartland")

Comment 4

Distribution Engagement: The AESO indicated that it will continue to implement its DER roadmap, which it presented as part of the AUC's Distribution System Inquiry technical conference.[2] HGL believes that the AESO should publish the DER roadmap alongside the Energy Storage roadmap on its website in the new centralized Stakeholder Engagement section. It is also noteworthy that the AESO did not engage stakeholders as part of DER roadmap, unlike the process it undertook for the Energy Storage roadmap. The AESO could easily increase the transparency of the DER roadmap by posting it online and including more detail than was provided during the Distribution System Inquiry technical conference.

AESO Response

Comment 4

Comment Noted. The AESO provided a presentation of the AESOs DER Roadmap at the AUC Distribution Inquiry Module 1 technical conference. The DER Roadmap requires alignment and coordination with the DFOs and as such the AESO started engagement with the DFOs to align on scope and to obtain DFO input. The AESO has kicked off some work around internal AESO processes and areas which affect the reliability of the AIES. The AESO will publish the DER Roadmap in 2020 to stakeholders.

[1] As evidenced by the AESO's TRP Factsheet

[2] The AESO presented on September 10, 2019 in Red Deer, Alberta as part of the AUC's Distribution System Inquiry Module One Technical Conference. It was filed on that proceeding as Exhibit 24116-X0417.

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

Independent Power Producers Society of Alberta ("IPPSA")

As the AESO is aware, Alberta's generation investment climate has undergone considerable churn in the past number of years. IPPSA welcomes the stability associated with the government's confirmation of the energy-only market going forward. IPPSA recommends the following at this phase of the AESO's BRP, consistent with this request for a period of stability:

Independent Power Producers Society of Alberta ("IPPSA")

Comment 1

IPPSA would discourage anything but minimal market initiatives over the near term.

AESO Response

Comment 1

Comment Noted

Independent Power Producers Society of Alberta ("IPPSA")

Comment 2

IPPSA recommends that the AESO create a stakeholder engagement body – similar to the Market Advisory Committee - to advise the AESO on its priorities going forward, to share views on market matters, and to identify options in advance of the AESO's formal stakeholder consultation. Such a committee would help inform the AESO of what stakeholders believe should be the AESO's key business initiatives

AESO Response

Comment 2

Comment Noted. The AESO recently engaged with industry on a new Stakeholder Engagement Framework and will consider this feedback as we finalize the Framework in 2020.

Independent Power Producers Society of Alberta ("IPPSA")

Comment 3

IPPSA is interested in seeing the AESO's own costs reduced to below $100 million for its 2020 budget year. We are aware that the AESO's 2015 budget, for example, was $93 million and given that major initiatives at the AESO have ended (Critical Transmission Infrastructure, Renewable Energy Program and Capacity Market), we believe a budget in this order for 2020 is achievable. Such a budget objective would be consistent with the 'minimal activity' IPPSA is seeking from the AESO over the near term.

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

AESO Response

Comment 3

Comment Noted. Please refer to AESO Response to ENMAX Comment 1, above. The AESO has undertaken several initiatives since 2015 that have budgetary impacts. These include implementation of Critical Infrastructure Protection (CIP) standards (internal and external compliance requirements), implementation of a new Energy Management System, ongoing REP costs for the programs for REP rounds 1,2,3 (settlement, commercial management, legal work, reporting, project connection) and the System Coordination Centre expansion operating cost new for 2020. In addition there are inflationary cost impacts for many of the AESO internal technology applications and services that are unavoidable (e.g. software licenses and subscriptions, managed services from third parties, etc.).

Independent Power Producers Society of Alberta ("IPPSA")

Comment 5

In terms of the specific initiatives proposed during the first BRP stakeholder meeting, we would prefer to evaluate them once we know their costs.
Thanks for considering this input.

AESO Response

Comment 5

Comment Noted. Please refer to AESO Response to ENMAX Comment 1, above

Industrial Power Consumers Association of Alberta ("IPCAA")

Comment 1

Market Sustainability and Evolution: IPCAA supports the AESO's plan to initiate stakeholder engagement for shorter settlement. We look forward to more details on how to participate in this process.

AESO Response

Comment 1

Comment Noted.

Industrial Power Consumers Association of Alberta ("IPCAA")

Comment 2

Market Sustainability and Evolution: Regarding the Energy Storage Roadmap and the DER Roadmap, it would be useful to know when we will see updates to the AESO's Net Demand Variability (NDV) study work.

Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

AESO Response

Comment 2

Comment Noted. The AESO anticipates providing an update to the Net Demand Variability study work by mid-2020.

Industrial Power Consumers Association of Alberta ("IPCAA")

Comment 3

Tariff: Can the AESO provide additional information on (i) timing for the 2020 Tariff Update; and (ii) timing for the 2017-18 Deferral Account Reconciliation? We appreciated the update to the Transmission Rate Projection (TRP). Can the AESO commit to a schedule for updating the TRP? IPCAA Members would appreciate an update every six months if that is possible.

AESO Response

Comment 3

Comment Noted. The AESO expects to file for 2020 tariff rate update in January 2020 with an expected AUC approval in Q1 or Q2 2020 on a final basis with a Q2 2020 implementation. The AESO expects the AUC approval of the 2017-18 Deferral Account Reconciliation in Q4 2019 with implementation in Q1 2020. An updated TRP Workbook is expected to be filed with the 2020 Tariff application revising bulk and regional tariff in Q2 2020. The AESO will consider releasing further information or more frequent updates.

Industrial Power Consumers Association of Alberta ("IPCAA")

Comment 4

Long-term system developments: IPCAA is concerned that the LTO reference case is already stale, given recent project announcements, including cogeneration and solar projects. However, we recognize that there are other scenarios that were considered. This should be given some attention during any upcoming LTP presentations. Many stakeholders have questions regarding why the reference case does not consider announced projects.

AESO Response

Comment 4

Comment Noted. The 2019 LTO includes announced projects which have been awarded Renewable Electricity Policy (REP) or Alberta Infrastructure contracts as development of these projects was deemed to be highly certain. Other announced projects have not been specifically included within the Long Term Outlook, however the forecast contains generic generation additions which could represent current announced projects. This approach has been taken because there is uncertainty in generation development and historically many projects that have announced to proceed have not materialized.

Industrial Power Consumers Association of Alberta ("IPCAA")

Comment 5

Distribution Engagement: Can the AESO provide additional information on how it will integrate the findings from the AUC's Distribution Inquiry into its Distributed Energy Resources (DER) roadmap? Also does the AESO plan to assist with the AUC's Distribution Inquiry?

Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

AESO Response

Comment 5

Comment Noted. The AESO DER Roadmap is broader than the Distribution System Inquiry as it is focused around the AESO accountability in reliability, internal processes, markets, stakeholder engagement and supporting policy in the DER space. We expect the findings of the inquiry to be more focused around tariffs and distribution regulations. However, the AESO will continue to be a participant in the Distribution System Inquiry and adjust the AESO DER Roadmap as required.

Industrial Power Consumers Association of Alberta ("IPCAA")

Comment 6

External Technology Plan: The AESO should consider modeling the impacts on rates of increasing levels of DER penetration. This would help further the discussion on rate design for the ISO tariff, as well as enhance the LTP process.

AESO Response

Comment 6

The AESO agrees that evaluating and assessing the impacts of DER penetration is an important consideration for future rate design proceeding at both the AESO and DFO level. The impacts of DER penetration forms a component of the 2020 LTP and will continue in future LTPs.

Industrial Power Consumers Association of Alberta ("IPCAA")

Comment 7

Settlement: IPCAA supports the AESO's plan to initiate a settlement audit of AESO settlement processes. IPCAA also supports public reporting on the results. IPCAA believes that such a settlement audit should begin at the meter and proceed through to the bill. IPCAA members have had concerns over whether the coincident peak data is correct, and IPCAA believes a complete audit of the whole settlement process from meter to bill will increase the value and credibility of the AESO, and in turn reduce investor risk.

AESO Response

Comment 7

Comment Noted. The AESO is in the process of determining what the scope of the settlement audit will include. Please see AESO response to ADC Comment 4, above.

Preliminary List of 2020 Business Initiatives – October 30, 2019 meeting
Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

TransAlta Corporation ("TransAlta")

Comment 1

Multi-year business initiatives need to be broken-down to show the objectives and goals expected to be achieved in 2020.

TransAlta notes that the business initiatives listed are multi-year initiatives making it very difficult to understand what is planned to be done in 2020. We would encourage the AESO to present the objectives and goals that we should expect to be achieved in 2020 for each of these initiatives so that market participants can understand how we measure the AESO's performance.

We believe that greater progress has to be made in terms of the AESO process of multi-year planning (e.g. 3-year budget), setting measurable goals and objectives, and clear prioritization of initiatives to improve resource usage and timely execution of business initiatives. We cannot continue to add business initiatives, engage, review and report; we need to execute meaningful changes that provide resolution and regulatory clarity for market participants.

AESO Response

Comment 1

Please refer to AESO Responses to Capital Power Comment 1 and Heartland Comment 1 , above

TransAlta Corporation ("TransAlta")

Comment 2

Transmission cost and rate design are the highest priority for 2020.

We encourage the AESO to put a high priority to transmission cost and rate design. Respectfully, transmission costs are a very significant cost for consumers – having reached levels that are comparable to cost of electricity. The issue with rate design and overall transmission spending continues to be raised in regulatory proceedings including the ISO tariff and is also driving the decisions of customers. We urge the AESO to prioritize transmission and rate design issues as these continue to be unaddressed.

AESO Response

Comment 2

Please see AESO response to Heartland Comment 3, above.

TransAlta Corporation ("TransAlta")

Comment 3

Energy storage is a high priority as significant investments have and are being made to bring projects online in 2020.

We also request that the AESO prioritize energy storage integration, which are going to be brought on-line even prior to the completion of the Energy Storage Roadmap. We are concerned that despite previous AESO engagement on storage technology that we continue to have a lack of clarity about the rules for energy storage. Significant investments, including TransAlta's investment in our WindCharger project, have already been made into new energy storage technologies, which has left the AESO in a position that it must react to new technology. While we understand that there have been other priorities such as the capacity market that diverted AESO resources, we also need to acknowledge that the lack of action in previous years increases the urgency to deal with these now.

Do stakeholders have any comments on the AESO's Business Initiatives proposed for 2020?

AESO Response

Comment 3

Comment Noted. The AESO is advancing the Energy Storage roadmap including the active connection projects and early adopters.

TransAlta Corporation ("TransAlta")

Comment 4

Business initiatives should be justified with information about the costs and benefits.

We also suggest that the Budget Review Process should be revised such that stakeholders are provided the costs associated with business initiatives prior to being asked to comment on the business initiatives. The business initiatives are very high-level and without information about the costs associated with each. We expect that the business initiatives should be justified with details that are similar to presented in business cases with a clear identification and quantification of benefits and costs. Due to the non-granular level that the information is presented in, we are not in a place to comment whether the initiatives should be pursued in the year. For example, we may have very little issue with a business initiative to educate the AESO on new technology if it was low cost but if the costs were very high that could impact our views on whether we believe that it is necessary (or if the scope seems right-sized).

AESO Response

Comment 4

Comment noted. Also, please refer to AESO Responses to Capital Power Comment 1 and Heartland Comment 1, above.

TransAlta Corporation ("TransAlta")

Comment 5

Break-out base business costs from the costs for discrete business initiatives.

The business initiatives list presented for 2020 includes internal initiatives, which is a departure from previous Budget Review Process information provided to stakeholders. While we commend the AESO for seeking to be more transparent about more/all of its initiatives, it is not helpful to list initiatives that represent non-material costs or are part of the routine day-to-day activities of the AESO. We appreciate that there are day-to-day costs that must be incurred to keep the power pool and electric system operating smoothly. We recommend that the AESO breakout its base business costs from its business initiatives, which are not routine in nature and the AESO has some discretion in executing (in terms of scope, scale and timing). We expect that the AESO will continue to seek to lower its base costs through efficiency improvements over time. It is only when these base costs change appreciably that we would want to further understand the drivers for those cost increases.

AESO Response

Comment 5

Comment Noted. Please refer to AESO Responses to Capital Power Comment 1 and Heartland Comment 1, above.

Other Comments

Do stakeholders have any other comments to offer at this time?

Alberta Direct Connect ("ADC")

Comment 1

The ADC appreciates the opportunity to comment and looks forward to the AESO own costs presentation.

AESO Response

Comment 1

Comment Noted. Please refer to AESO Response to ENMAX Comment 1, above

Capital Power Corporation ("Capital Power")

Comment 1

Capital Power has no further comments at this time.

AESO Response

Comment 1

Comment Noted.

ENMAX Corporation ("ENMAX")

Comment 1

ENMAX recommends the AESO revisit the formation of the Market Advisory Committee or similar stakeholder engagement process as a mechanism to advise the AESO on prospective AESO initiatives and their priority to stakeholders. These discussions and feedback need to be held as early in the AESO's budget process as possible. Incorporating this feedback at the BRP stage reduces its value as the initiative priorities have already been made.

AESO Response

Comment 1

Comment Noted. Also, please refer to AESO Response to IPPSA Comment 2, above

Other Comments

Heartland Generation Ltd. (“Heartland”)

Comment 1

HGL believes that a more thorough discussion will be possible after the AESO identifies the costs of its specific business initiatives. In future meetings, HGL anticipates being in a better position to opine on the relative prioritization of the proposed initiatives and whether they warrant the associated costs. It is notable that there have been significant increases to the AESO trading charge; HGL expects the recent policy direction on both the capacity market implementation and renewable electricity program will significantly reduce these costs. Due to the end of these and other major initiatives, a budget more in line with that of 2015 (~$93 million) should be an achievable goal.

The creation of a formal stakeholder committee should be a priority for the AESO Board. This stakeholder committee would aid in planning the AESO’s priorities and determining if they align with the priorities of market participants. The committee would also allow for more efficient engagement with market participants in creating timelines for those priorities.

AESO Response

Comment 1

Comment Noted. Please refer to AESO Response to Capital Power Comment 1, Heartland Comment 1 and IPPSA Comment 2, above

Industrial Power Consumers Association of Alberta (“IPCAA”)

Comment 1

Distribution Cost Oversight: As mentioned previously, IPCAA members are concerned with the increasing distribution costs in Alberta. On average, DFO revenue requirement increased around 7% annually from 2009 to 2017, with average load growth that was less than 1%. This indicates a problem. In fact, the revenue requirement for FortisAlberta, from 2009 to 2017, increased at an annual rate that was 23 times faster than the annual rate of load growth on the distribution system. Is the AESO able to provide some better information for customers on why this disconnect is occurring? Can the AESO allocate some resources to examining if there is anything the AESO itself is able to do to help remedy this disconnect, or at least provide more transparent data?

AESO Response

Comment 1

Comment noted. The AESO notes that DFO rates are regulated by AUC under performance-based regulation (PBR) framework, which is a rate setting mechanism that breaks the direct link between the costs of a utility and the rates charged to customers. The PBR framework provides the DFOs with the opportunity to make cost decisions while meeting their duties and obligations under the Electric Utilities Act and the Alberta Utilities Commission rules. Distribution cost oversite is not a mandate or duty of the AESO. However, the AESO is planning an initiative in 2020 to enhance the planning at the Distribution and Transmission interface to ensure the most economical alternative are evaluated for the appropriate level of reliability.

Industrial Power Consumers Association of Alberta (“IPCAA”)

Comment 2

Overall AESO Budget: As stated through several years of AESO budget review processes, IPCAA submits if the AESO’s G&A costs are above $100M per year, these should be filed with the AUC as part of the ISO Tariff Application. There should be a limit to the consumer costs that can be approved without regulatory review.

AESO Response

Comment 2

Comment Noted. Please refer to AESO Response to ENMAX Comment 1, above

Other Comments

Industrial Power Consumers Association of Alberta ("IPCAA")

Comment 3

Fort McMurray West Project: IPCAA recommends that the AESO produce a report for consumers summarizing the value of the competitive process for this project. We recognize that the project summary is available (https://www.aeso.ca/grid/competitive-process/fort-mcmurray-west-500-kv-transmission-project/); however, it would be useful to compare these transmission costs to others from the AESO's database. Consumers would like to understand if the competitive process was a worthwhile venture in this instance, and highlight any lessons learned for potential future use. The AESO should consider whether there is value in using this process for: Alberta – BC Intertie Restoration (AIR), Chapel Rock-to-Pincher Creek (CRPC) and Central East Transfer-Out (CETO).

AESO Response

Comment 3

Comment Noted

TransAlta Corporation ("TransAlta")

Comment 1

The AESO 2020 budget should be at a level that is comparable to 2015.

TransAlta is seeking more information to know that the high increases in AESO costs and pool trading charge that were driven by the capacity market will be materially reduced in 2020. We see no need for materially changes being made to the energy-only market given the government and market participants views as expressed in the 90-day capacity market review process. TransAlta supports the market as is and regulatory stability to allow for needed investment to occur. In this respect, we ask the AESO to restrain its operating costs just as industry has done as the Alberta economy has slowed. Our view is that the budget costs should reflect the levels seen in 2015 (prior to the capacity market). We understand and appreciate that this will require a more judicious approach to prioritizing business initiatives than may have been required in previous years.

AESO Response

Comment 1

Comment Noted. Please refer to AESO Response to ENMAX Comment 1 and IPPSA Comment 3, above

AESO Consultation –2020 Budget Review Process (2020 BRP) - AESO's 2020 Forecasts (Ancillary Services, Transmission Line Losses) and Preliminary Own Costs Budget

The AESO has asked market participants and interested parties to comment on the AESO's 2020 Forecasts and Preliminary Own Costs Budget. The related information was presented on November 29, 2019 at the BRP technical meeting in Calgary. Stakeholder comments received are provided in the following matrix. The matrix also includes AESO management's response to these comments.

Alberta Electric System Operator

Calgary Place, 2500, 330-5th Avenue SW Calgary, AB T2P 0L4

Phone: 403-539-2450 | Fax: 403-539-2949

www.aeso.ca

@theaeso

Pool Price Forecast and Load Outlook for 2020

Do stakeholders have any comments on the Pool Price forecast and Load outlook for the upcoming year?

Alberta Direct Connect ("ADC")

The ADC recommends that the AESO take a more conservative approach to the load growth forecast. Our concern is that an over forecast will result in insufficient revenue leading to an unexpected deferral account adjustment.

AESO Response

The Alberta Internal Load (AIL) forecast presented in the 2020 BRP is based upon the 2019 LTO, released in September 2019 (found here). The 2019 LTO provides key growth assumptions underpinning AIL growth. The 2.8% 2020 AIL growth can be attributed to a number of factors including economic and population growth, oilsands production growth, and growth of additional load drivers. Forecast oilsands growth accounts for the largest portion of AIL growth and relates to additional crude by rail exports, the operation of Line 3 in Canada and debottlenecking projects for other pipelines allowing for additional export capacity and related oilsands expansion. Industrial growth in the Edmonton and Fort Saskatchewan areas as well as new load drivers, including cryptocurrency mining operations and cannabis growing facilities, are also expected to contribute to AIL growth. A material portion of forecast AIL growth is related to projects that are currently operational or anticipating operation in 2020. As several stakeholders have also observed, the AESO recognizes that recently AIL has been increasing faster or decreasing slower than system load and DTS load.

The key forecast inputs to the BRP include a forecast for system load, which is used to calculate the energy market trading charge, net-to-grid load, which is used to forecast OR costs, and a line loss forecast. The AESO's response to HGL's first comment below contains a link to the system load forecast values, while the table below contains the net-to-grid load forecast. A forecast of line losses, which doesn't utilize load as a direct input, can be found on slide 21 of the AESO's BRP presentation (found here). In light of decreases observed in system load and DTS load, as identified in IPCAA's first comment below, the AESO has investigated these key forecast inputs to ensure they align with up-to-date information and to assess their impacts on budgeted costs. The AESO has investigated the forecast system load volumes used for the energy market trading charge and acknowledges that this forecast may reflect relatively high values given the recent load declines in 2019. The AESO tested a lower system load forecast for 2020 which accounts for the 2019 load decline; however, this lower system load forecast did not result in a material change to the energy market trading charge. For the net-to-grid load forecast and the forecast of line losses, the AESO has determined that the impact of updating these key forecast inputs is not material to the cost forecasts given the multiple inputs that derive these calculations.

Year	Net-to-grid Load Annual Energy (GWh)*
2018	64,875
2019	63,664
2020	64,670

***Actuals until the end of August 2019**

Pool Price Forecast and Load Outlook for 2020

Do stakeholders have any comments on the Pool Price forecast and Load outlook for the upcoming year?

Heartland Generation Ltd. ("Heartland")

Heartland Generation Ltd. (HGL) has no material comments on the pool price forecast for 2020.

HGL suggests that the AESO should publish an Alberta Interconnected Electric System (AIES) and Demand Transmission System (DTS) forecast alongside the Alberta Internal Load (AIL) forecast. Both AIES and DTS are important for transmission cost determinations and would provide valuable context for review of the load outlook.

AESO Response

HGL's comment is noted. While there is no definition of "Alberta Interconnected Electric System (AIES)" load, the AESO assumes HGL is referring to system load, as defined in the AESO's Consolidated Authoritative Document Glossary (found here). The AESO's system load forecast utilized in the BRP and DTS load forecast can be found in the data file accompanying the 2019 Long-term Outlook ("LTO") (found here).

The AESO notes that the difference between DTS load and system load is load served through Demand for Opportunity Service ("DOS") contracts, Rate Fort Nelson Transmission Service ("FTS") load, and transmission losses. Transmission losses make up the vast majority of the difference between system load and DTS load with system load greater than DTS by approximately 3.1% on average.

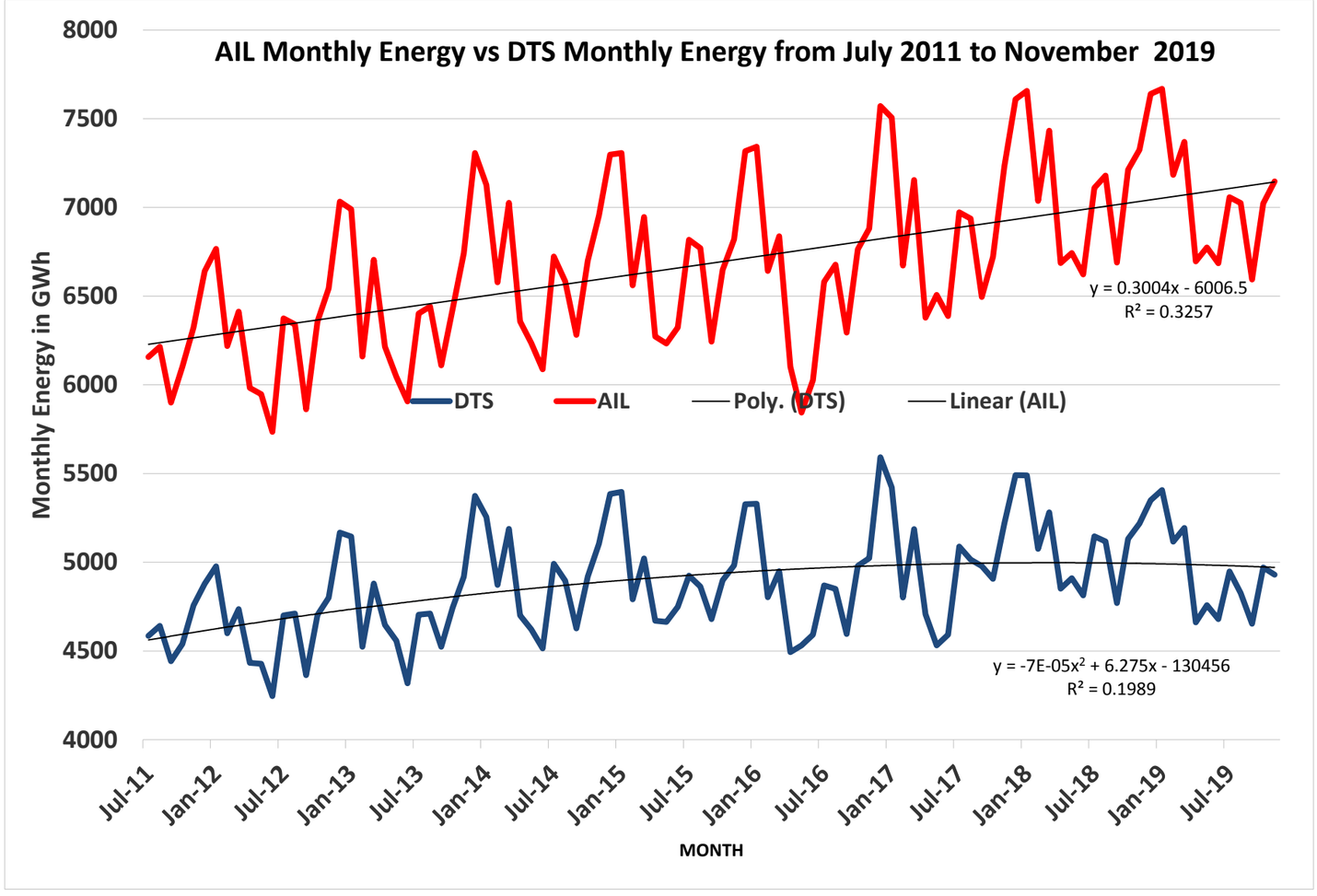
Industrial Power Consumers Association of Alberta ("IPCAA")

On slide 14, the AESO is forecasting that year-over-year Alberta Internal Load (AIL) will increase by 2.8% in 2020. IPCAA is concerned that the forecast may be too high. The DTS load, which actually flows on the transmission system and is the vast majority of the load that pays for transmission costs, appears to have flattened or recessed in 2019. Can the AESO provide more information on why this 2.8% AIL increase is being forecast? Also, can the AESO provide a forecast of the load numbers it is using to calculate transmission costs and market volumes for AS, Line, Losses, the energy market trading charge, etc.

For your benefit we have attached two charts illustrating monthly energy demand as well as monthly peak demand for both AIL and DTS. All of these values are obtained from the AESO's website. IPCAA recommends that the AESO re-create this analysis, since information available to the AESO internally may be more complete. The AESO also has the ability to weather-normalize the data.

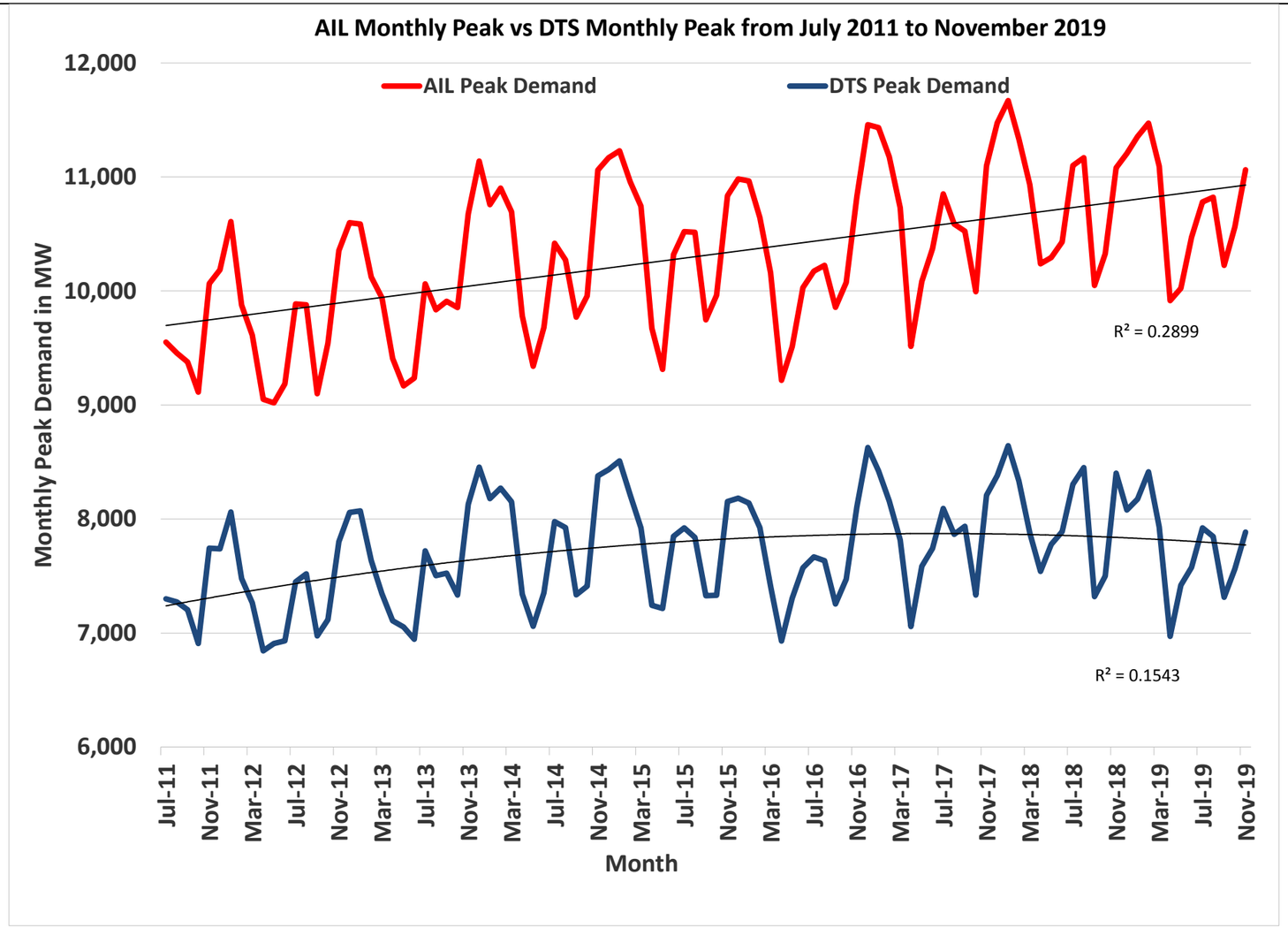
Pool Price Forecast and Load Outlook for 2020

Do stakeholders have any comments on the Pool Price forecast and Load outlook for the upcoming year?



Pool Price Forecast and Load Outlook for 2020

Do stakeholders have any comments on the Pool Price forecast and Load outlook for the upcoming year?



Pool Price Forecast and Load Outlook for 2020

Do stakeholders have any comments on the Pool Price forecast and Load outlook for the upcoming year?

Table 1: Annual Energy from December to November in GWh:

	Annual DTS Energy	Annual AIL Energy	DTS Change YOY	AIL Change YOY
2011 - 2012	55577	75182		
2012 - 2013	56840	77177	2.3%	2.7%
2013 - 2014	59064	79960	3.9%	3.6%
2014 - 2015	59028	80237	-0.1%	0.3%
2015 - 2016	58343	79306	-1.2%	-1.2%
2016 - 2017	60040	82533	2.9%	4.1%
2017 - 2018	61297	85301	2.1%	3.4%
2018 - 2019	59496	84862	-2.9%	-0.5%
SUM			7.0%	12.4%
Average			1.0%	1.8%

It is not clear, based on the DTS energy and monthly peak demand and the annual statistics, that there is any trend that would indicate a 2.8% load growth.

IPCAA is concerned with the load forecast, because an over-forecast of the load volume could result in an under-collection of the AESO's costs. Customers want predictability with regard to their electricity bills, and large adjustments due to over-forecasting will be a problem.

AESO Response

The AESO thanks IPCAA for its comments and insight and for its background research. Please see AESO's response to ADC's first comment above.

Pool Price Forecast and Load Outlook for 2020

Do stakeholders have any comments on the Pool Price forecast and Load outlook for the upcoming year?

TransAlta Corporation ("TransAlta")

We appreciate the information about the Pool Price forecast and the load outlook. We wish to understand how aligned the pool price forecast is with the load outlook. We note that EDC typically conducts its own load forecast and that can be materially different that the load forecast that the AESO uses for its reference case in the Long Term Outlook. We request a comparison of the load forecast used by EDC in arriving at its pool price forecast and the AESO's load forecast to understand how the difference between the two.

AESO Response

Under the terms of the AESO's EDC subscription, the AESO is unable to provide a value-to-value comparison of EDC's load forecast to the AESO's. However, the AESO used EDC's 2019 Q3 price forecast in the 2020 BRP calculations, which had a 2020 forecasted AIL growth rate approximately one percentage point above the AESO's forecasted AIL growth rate. Of note, EDC's Q4 forecast update contained a 2020 forecasted AIL growth rate similar to AESO's forecasted AIL growth rate. However, from EDC's 2019 Q3 update to its 2019 Q4 update, an average price decrease of $1.50/MWh or 2.6% was observed. The AESO believes that the relatively minor price change seen between the two EDC quarterly updates indicates that differences in load forecast assumptions do not have a significant impact on prices.

It is more appropriate that the pool price forecast provided is aligned with the same load forecast that the AESO presents in the budget. We recommend that future budget processes ensure that these differences are minimized by having EDC forecast pool prices using the same load forecast developed by the AESO.

AESO Response

The AESO acknowledges TransAlta's comments. As the AESO continues to work towards improving the BRP, it will take this feedback into account going forward.

Utilities Consumer Advocate ("UCA")

The UCA would like more clarity around the AESO's AIL estimated load growth projection of 2.8% from 2019-2020, especially since YoY population growth is only around 1.4% and 2017-2018 load growth was only 0.2%. According to the Petroleum Services Association of Canada (PSAC), only 2155 wells will be drilled in Alberta, down 235 from 2019. Although The Canadian Association of Petroleum Producers (CAPP) is forecasting annual oil sands production growth from 2019-2021 to average 4%, 2017-2018 oil sands production was 8%, while load growth during this same period (2017-2018) was only 0.2%. Based on the above analysis and forecasting put forth by CAPP, oil sands forecasting may not be a strong indicator of load growth. Also of consideration is that oil sands production growth will depend on significant amounts of cogeneration to power their operations, further limiting load growth estimates based on oil sands development**.**

AESO Response

Please see AESO response to "ADC's" comment regarding the load growth forecast, above.

AESO Wires, Ancillary Services and Transmission Line Losses Costs Forecasts for 2020

Do stakeholders have any comments on the Wires, Ancillary Services and/or Transmission Line Losses costs forecasts for the upcoming year?

Alberta Direct Connect ("ADC")

No Comments

Heartland Generation Ltd. ("Heartland")

HGL has no material comments on the Wires, Ancillary Services and/or Transmission Line Losses cost forecasts.

Industrial Power Consumers Association of Alberta ("IPCAA")

1. Ancillary Services:

Regarding the existing TMR contract (slide 18), can the AESO provide some information on what replaces it?

AESO Response

With regard to the Poplar Hill TMR ancillary service contract shown on Slide 18, TMR service from that generating unit is no longer needed. Periodically, the AESO conducts studies to identify any geographic area(s) within the AIES where local transmission infrastructure is insufficient relative to local demand, potentially requiring TMR services (as either new or maintaining existing). Should the AESO identify a long-term requirement for TMR services, procurement efforts would be undertaken for these services to ensure that reliability is maintained in the area until adequate transmission infrastructure is built. The procurement approach for TMR services is typically the following:

- **The AESO would approach generators located in the identified local area(s) for a bi-lateral negotiation with the intent of entering into a contract for TMR services.**
- **The AESO reserves the right to modify its TMR procurement approach to ensure Albertans continue to receive reliable and cost effective electricity.**

Does the AESO plan to conduct a review of the competitiveness of the AS markets? If so, when will this be conducted?

AESO Response

The AESO has conducted a preliminary review of operating reserve market and believes that steps to increase the competitiveness of the operating reserve market should be further explored. While timing of this work hasn't been finalized, the AESO plans to continue internal assessments and when appropriate will propose an engagement approach to stakeholders.

2. Transmission Line Losses:

In the following table, we have calculated the percentage loss data from files published by the AESO, including:

1. AESO 2018 Annual Market Statistics Average Annual system load (MW): https://www.aeso.ca/market/market-and-system-reporting/annual-market-statistic-reports/
2. AESO 15 Minute System Load (MW): https://www.aeso.ca/market/market-and-system-reporting/data-requests/15-minute-system-load-metered-volumes/

Year	AESO System Load with losses in GWh	AESO System Load without Losses in GWh	Annual Loss in GWh	% Loss
2013	**60,470**	**57,993**	**2,477**	**4.3%**
2014	**62,476**	**59,067**	**3,409**	**5.8%**
2015	**62,284**	**58,967**	**3,317**	**5.6%**
2016	**61,933**	**58,618**	**3,315**	**5.7%**
2017	**63,247**	**60,173**	**3,074**	**5.1%**
2018	**63,834**	**61,073**	**2,761**	**4.5%**

These numbers do not match the volumes on slide 21. Can the AESO help reconcile this data mis-match?

AESO Response

The system load values provided by the AESO in the two referenced sources are not exactly the same despite both being referred to as "system load":

- **The system load values from the *2019 Annual Market Statistics* report with losses (second column in the table above) contains the total, in an hour, of all metered demands under Rate DTS, Rate FTS and Rate DOS of the ISO tariff plus transmission system losses.**
- **The AESO system load without losses (third column in the table above) contains the total, in an hour, of all metered demands under Rate DTS, Rate FTS and Rate DOS with adjustments applied for billing purposes, specifically for sites with a duplication avoidance tariff ("DAT", see Riders A1, A2, A3, and A4 of the ISO tariff: https://www.aeso.ca/rules-standards-and-tariff/tariff/).**

Billing adjustments applied to system load without losses (third column in the table) cause the annual losses column (column 4 in the table above) to be larger than actual losses. Settlement data including DTS, FTS, and DOS load can also change over time so it is possible that part of the discrepancy relates to the timing of when the data was compiled. The AESO apologizes for this confusion and will better explain and clarify the system load data provided in future Annual Market Statistics reports.

3. Wires Costs:

Can the AESO share its ideas for addressing large DAR balances, so that IPCAA can support viable solutions in front of the AUC? Possible options we have discussed include sunset clauses on older balances and moving away from using an estimate of 72% of applied for Transmission GTA revenue requirements. Recently, TFOs have received much more than 72% of their applied for revenue requirements. IPCAA also supports the AESO filing one year deferral accounts instead of two years. This should mean smaller adjustments.

IPCAA members are having difficulty budgeting for large DAR-related charges and explaining them to senior management.

AESO Response

We appreciate your support. The AESO recognizes that large deferral account reconciliation (DAR) balances are impactful to market participants. The 2017-2018 DAR was a two year deferral account reconciliation due to the time required to make deferral account reconciliation system changes resulting from the AUC's approval of a change to the DAR methodology. Even so, the AESO strives to file only one year of deferral account reconciliations at any time and is working diligently to support this effort. While not all delays are within the AESO's control, modifications to the underlying system and resource requirements are being evaluated and are included in the AESO's IT Strategic Initiative surrounding efficiencies and productivity enhancements.

Potential future changes to DAR methodology, such as a review of the 72% to determine forecast wires costs and the cost/benefit and equitable treatment of potential sunset clauses and materiality thresholds are being discussed internally. These issues will require review by the AESO with stakeholders leading up to an application to the AUC for approval. Timing of this stakeholder engagement and potential tariff filing with the AUC has yet to be determined by the AESO and will be considered within the priorities of all ISO tariff work.

As summarized in AUC Decision 24910-D01-2019, the AESO noted that if there were no changes to the DAR methodology it would be possible for it to file its DAR application in quarter two of a calendar year. The AESO also stated that it could provide DFOs with preliminary estimates of annual deferral account shortfall or surplus amounts by the end of quarter one.

TransAlta Corporation ("TransAlta")

No comments

Utilities Consumer Advocate (UCA)

When do the IBOC and LBC SO contracts end?

AESO Response

The Invitation to Bid on Credit (IBOC) contract expires in 2021 and the Location Based Credit Standing Offer (LBC SO) contracts expire in 2022 and 2024.

The AESO intends to spend $2.4 MM on contracted TMR. Please explain what units are contracted and for what purpose. Also, explain the long term solution for the contracted TMR considering the restrictions on non-wire solutions found in the Transmission Regulation.

AESO Response

Please see AESO's response to "IPPCA's" comment regarding TMR on page 8 of the *Stakeholder Comment and AESO Replies Matrix, AESO Consultation –2020 Budget Review Process (2020 BRP) - AESO's 2020 Forecasts (Ancillary Services, Transmission Line Losses) and Preliminary Own Costs Budget*. Also, the contracted TMR forecast at $2.4 million includes one unit currently under contract. The TMR agreement is forecast at 100% availability for the purpose of the 2020 Forecast until the termination of the contract at the end of September.

For years the AESO has been spending $2.9 MM/year on “Reliability Service”. Please describe any and all related benefits we wouldn’t have received absent the payment. How many more years are we locked into this service? Has the AESO considered any cheaper alternatives?

AESO Response

In 2015, the AESO entered into a 15-year Reliability Services Agreement (RSA) with Powerex Corp. for the provision of certain emergency energy services from British Columbia, including grid restoration balancing support in the event of an Alberta blackout and emergency energy in the event of supply shortfall. The total cost of the agreement is $42.9 million payable in equal amounts in the three-year period from 2015 to 2017. As the payments are made, they are recognized as long-term prepaids on the statement of financial position and amortized on a straight-line basis over the 15-year term of the agreement. The benefit that is received is fulfilling the need for grid restoration balancing support services in the event of an Alberta blackout or the need for emergency energy in the event of supply shortfall is required. With respect to cheaper alternatives, the AESO would not be able to replace the contract until the contract 15-year term is complete.

Given the ISO’s duties under section 17(b) of the EUA, the AESO should look at redesigning the ancillary service market to allow modern technologies, such as wind, solar and storage to participate effectively. Not only would this enhance competition and potentially drive prices down but it would be an opportunity to review some of the antiquated requirements that the current AS market is founded on, e.g., provide for an hour, requirement to provide for entire on or off peak timeframes. Requirements such as these prohibit the participation of some modern technologies that would be far more effective in the providing reliable service for the AIES than current providers.

AESO Response

The AESO received similar requests for a review of the ancillary services markets through stakeholder feedback on the Markets Initiative Plan. Based on this feedback, the AESO is considering approaches to and benefits that might result from a review of the operating reserves market. Prior to making any commitments on changes to the operating reserve market, the AESO is considering the objectives of a review of the market, the priorities of the review, and the interdependencies with other AESO initiatives such as the energy storage roadmap and the DER roadmap. The AESO believes that vigorous competition in the OR market, as well as the energy market, produces the best price outcomes for consumers in the short term and a more reliable market over the long term. Any review of the operating reserves market will also ensure that reliability needs of the system are met as the electricity market undergoes change as a result of changing supply sources. The AESO will provide an update to stakeholders on this in the second half of 2020.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

Alberta Direct Connect ("ADC")

ADC recommends a careful review of the G&A budget to ensure it reflects cost cutting measures that are facing the private and public sectors in the current economic environment.

That being said, the ADC also wants to ensure there are sufficient resources to deal with the deferral account reconciliation and tariff updates on a timely basis. With the new Rider C approach, ADC members were expecting a minimal DAR adjustment, but for our 9 members the 2017/2018 DAR amounts to several million dollars in costs that were unexpected creating budget and cost allocation issues.

AESO Response

The AESO continues to look for opportunities to reduce costs and gain efficiencies. As noted in the 2017-2018 DAR application, a number of significant transmission-facility owner applications and revisions occurred after ISO tariff rates were finalized and before the 2017-2018 DAR cut-off date. Even though significant DAR methodology, Rider C and ISO tariff update process changes have been made to work towards minimizing DAR balances, the ISO tariff update process is dependent on timely transmission facility-owner applications and approvals.

For further information, please see AESO's response to "IPCAA's" question regarding wire costs and the AESO's efforts to mitigate the size and timing of the DAR.

Capital Power Corporation ("Capital Power")

Capital Power appreciates the opportunity to participate in the AESO BRP consultation and submits the following comments for consideration.

Capital Power supports reasonable efforts by the AESO to reduce costs associated with the administration of the Alberta electric system. Maintaining administrative costs at a level in line with comparable jurisdictions helps to ensure Alberta remains a competitive jurisdiction for capital allocation and long-term development of generation.

The AESO material notes several areas where significant cost reductions have been realized, some of which is associated with the cancellation of the capacity market. Capital Power acknowledges and supports these efforts. Where additional opportunities exist to reduce cost, the AESO should consider these opportunities in the current budget year. This includes pursuing an expedited process with the Alberta Utilities Commission to address mounting deferral account balances, on which the AESO is spending material costs associated with interest payments.

AESO Response

The AESO continues to look for opportunities to reduce costs and gain efficiencies. In reference to the mounting deferral account balances, please see AESO's response to "IPCAA's" and "ADC's" comment s regarding the deferral balances and the AESO's efforts to mitigate the size and timing of the DAR. See also AESO's response to "ENMAX" regarding cost control measures.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

ENMAX Corporation ("ENMAX")

AESO Cost Control Measures

A number of AESO costs have continued to increase significantly (e.g., trading charge), despite recent policy changes to not move forward with implementing a capacity market or continue with the Renewable Electricity Program. ENMAX encourages the AESO to take reasonable measures to reduce its costs where possible and work towards returning budget costs back to 2015 levels (pre-capacity market).

There are a number of initiatives taking place within the industry that overlap and are duplicative. The AESO should continue to evaluate whether it is more appropriate to shift certain priorities to help reduce material costs and ensure a better regulatory outcome.

AESO Response

The AESO continues to look for opportunities to reduce costs and gain efficiencies. Refer to AESO's response to "TransAlta" below, wherein comparisons to historical periods have been presented. You will note that the 2020 G&A budget is generally consistent with the years 2014, 2015 and 2016 (pre-Capacity Market). This is despite the impact of inflation on AESO costs over the 5 year period (software licenses and subscriptions, managed services from third parties, etc.); implementing CIP standards in October 2017; a new EMS system in June of 2017; the strategic shift to Software As A Service (SAAS) products, moving costs from capital software to general and administrative; and the SCC expansion project completed in 2019. Significant effort is being incurred to mitigate the impact of rising costs to align spend with historical costs.

A Summary of the more significant cost increases that are the in 2020 budget that would have not existed prior to the capacity market and Renewable Electricity Program initiatives are as follows:

Ongoing implementation costs for REP rounds 1, 2, and 3	**$1.0 million***
New EMS 3.0 and CIP related costs	**1.3 million**
Cyber/cloud/subscription as a service costs/inflation	**0.7 million**
New System Control Centre expansion operating costs	**0.5 million**

- **General and administrative costs only ($2.1 million if include depreciation and interest).**

It should be noted that staff costs, general and administrative, in the 2020 budget are $66.7 million, which is consistent with the 2016 actual staff costs of $66.4 million (pre-capacity market).

The budgeted General & Administrative costs allocated to the Energy Market is an estimate and will vary (more or less) based on actual volumes and activity throughout the year. The current AESO own costs component of the Trading Charge is 4.1 cents per MWh greater than 2015 and only 2.0 cents per MWh greater than in 2014. The 2014 Trading Charge resulted in a deficit that was carried to 2015, demonstrating the variability in actual vs. forecasted volumes and activity.

The AESO works to take a strategic and collaborative approach to its initiatives and will continue to seek external input and prioritize accordingly.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

Heartland Generation Ltd. ("Heartland")

HGL is concerned about the increased cost of "interest" due to the AESO carrying large deferral accounts. The AESO should provide stakeholders with a plan to reduce the burden of interest in the future, e.g. the AESO encourage the Alberta Utilities Commission (AUC) to expedite the deferral account proceedings to reduce interest cost.

The AESO has included a proposed staff compensation increase of $2.0 million, to "adjust compensation to align with market."1 The government of Alberta is limiting budgets and making cuts, the AESO seems out of alignment with these actions and the general economic climate of the market and province. The AESO should indicate to stakeholders how the inclusion of the proposed staff compensation increases will align itself with the other provincial agencies.

AESO Response

The AESO continues to look for opportunities to reduce costs and gain efficiencies. In reference to the large deferral account balances, please see AESO's response to "IPCAA's" and "ADC's" comments regarding the deferral balances and the AESO's efforts to mitigate the size and timing of the DAR.

The AESO has subsequently reduced the salary market adjustment proposed to $1.0 million in response to the continued salary restraint imposed by the Government of Alberta under the Salaries Restraint Regulation. In accordance with the Regulation, base salary adjustments are permitted for promotions; to correct salary inversion (a situation in which the base salary of an employee is greater than the base salary of the employee's supervisor); and to correct salary compression (a situation in which the difference in base salary between employees is too small to be equitable). The *Reform of Agencies, Boards and Commissions Compensation Act* provides for these adjustments, for all public agencies, which is considered a necessity to retain and attract qualified personnel. Given the salary restraint has been in place since 2016, these situations continue to arise and cannot be mitigated beyond the staff reductions already implemented. The AESO, like all organizations, must plan for and manage attrition. As a result of attrition, current employees are replaced by employees at market rates. The difference in market rates from 2016 – 2020 creates an increase in salary costs over the amount budgeted when hiring for normal turnover. This is in addition to promotions and increases required to negate the secondary effects of salary inversion and compression. There have been no base salary pay adjustments since 2015. These items are not budgeted for within the base salary costs. The AESO instead provides full disclosure of the overall impact expected by noting the amount separately in an effort to be transparent.

The budget consideration entitled "Market Sustainability and Evolution"2 seems open to scope creep risk. HGL is concerned that the AESO has already decided to implement "the dispatch tolerance and ramp rate rule changes." Stakeholders have not had the opportunity to consult on this initiative outside the capacity market context; within the capacity market context, the net demand variability studies demonstrated there was no imminent issue until mid-2020 and that coal conversions to gas, currently being undertaken, would necessarily affect this outcome

AESO Response

As noted in the letter and the *2020 Plan for Market- Related Initiatives* the AESO will be engaging on both the ramp rate table and dispatch tolerance in 2020.

In order to limit scope creep, the AESO should clearly indicate what is required in "Market Sustainability and Evolution" and not merely include objectives that are related to the topic. This would also include the transparent reporting of consultation costs, both internal and external, and the publication of related advice and reports. The impacts of individual initiatives on the overall budget is unclear. HGL suggests a more fulsome discussion between the AESO, including those individuals heading the initiatives, and stakeholders.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

AESO Response

The AESO provided more details on the scope of Market Sustainability and Evolution initiatives to be progressed in 2020 in the released *2020 Plan for Market-Related Initiatives*. The AESO, with industry engagement, will focus on these initiatives which are identified as important to the long-term sustainability of the energy-only market structure, to maintaining system reliability, and in ensuring the AESO is facilitating a fair, efficient and openly competitive (FEOC) market for an evolving electrical system while also providing certainty and stability to the market structure.

HGL does not understand the difference between the budget consideration "Distribution Engagement" and "External Technology Plan." It is unclear how both of these initiatives would not be included in the Distributed Energy Resources (DER) Roadmap. As previously mentioned, it would also be helpful to include stakeholder engagement on the DER Roadmap, to better align the expectations of industry with the priorities and budget of the AESO. Currently the DER Roadmap only resides within the AUC's Distribution Inquiry.

AESO Response

There are elements of the "Distribution Engagement" initiative that are outside of the DER Roadmap, such as coordinated transmission and distribution planning and distribution planning criteria. There are elements of the "External Technology Plan" initiative that are outside of the DER Roadmap, a significant amount of the "External Technology Plan" does not involve distribution or DER as it is only one of the elements.

The "External Technology Plan" is about how the AESO effectively ensures we are engaged in new technology developments that can impact/influence the electricity value chain. We are working through a plan and a process for us as an AESO to deliver on this need, and ultimately engage with industry and stakeholders on our views of these technology developments, potential impacts to our electricity industry and AESO mandate. Further, this plan is about how we would facilitate the integration of these new technologies into our network, markets, etc. The purpose of the "External Technology Plan" is to engage external stakeholders to share what the AESO is doing to be proactive so we are ready to integrate new technologies as well as be open to feedback from stakeholders.

The AESO provided a presentation of the DER Roadmap at the AUC Distribution Inquiry Module 1 technical conference. The DER Roadmap requires alignment and coordination with the DFOs and as such the AESO started engagement with the DFOs to align on scope and to obtain DFO input. The AESO has kicked off some work around internal AESO processes and areas which affect the reliability of the AIES. The AESO will make the DER Roadmap publically available in 2020.

Independent Power Producers Society of Alberta ("IPPSA")

For the 2020 budget, IPPSA reiterates its request that the AESO reduce its own costs further and reduce its trading charge. We provide the following input on the content presented to stakeholders on November 29:

1. IPPSA appreciates any and all AESO efforts to expedite deferral account decisions at the Alberta Utilities Commission. The interest cost that the AESO is incurring as a result of these delays is material.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

AESO Response

Please see AESO's response to "IPCAA's" and "ADC's" comments above regarding the deferral balances and the AESO's efforts to mitigate the size and timing of the DAR.

2. At this point in time in Alberta's economy, along with the public sector cost control being signaled by the Alberta government and the rising AESO trading charge, we would urge the AESO to reconsider its proposed $2 million in salary increases.

AESO Response

Please see AESO's response to "Heartland", above.

3. We recommend that the AESO reduce the cost of its policy priorities accordingly:

a. *"Market Sustainability and Evolution"*

i) Rationalize the scope of "Market Sustainability and Evolution" to achieve cost savings. The scope of these initiatives should be reduced to only that what is necessary to address the Minister's directions to the AESO.

AESO Response

The scope of the "Market Sustainability and Evolution" activities is based on progressing market-related initiatives in 2020 that are important to the long-term sustainability of the energy-only market structure, to maintaining system reliability, and in ensuring the AESO is facilitating a fair, efficient and openly competitive (FEOC) market for an evolving electrical system while also providing certainty and stability to the market structure.

ii) Remove "*Initiate design based on any changes in policy direction."* This appears to be out of scope given the Minister's direction to retain the Energy-Only Market, or at least can be deferred until trading charge is reduced.

AESO Response

"Initiate design based on any changes in policy direction" refers to policy changes within the energy-only market resulting from the Minister's July 25, 2019 direction for the AESO to provide advice on Market Power Mitigation and recommendations on whether changes are needed to the price cap, price floor and scarcity pricing.

b. *"Long-Term System Development"* appears to be part of the AESO's routine duties. As such we don't believe this requires any new operating costs for the AESO.

AESO Response

This is part of base business and operating costs would be similar to prior years. While the long-term system development is a routine activity, there are at least two and possibly three major system NID applications that will be filed in 2020. These applications will go through the regulatory process which is quite resource intensive. This is why the long-term system developments have been highlighted in the budget considerations.

c. *"Stakeholder Engagement Framework*" should have a minimal cost.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

AESO Response

The AESO wants to improve how we engage stakeholders to ensure our approach continues to allow stakeholders' needs and interests to be consistently, transparently and meaningfully considered. Implementation of the AESO's Stakeholder Engagement Framework is expected to utilize existing internal resources across the organization. Costs associated with implementation are not expected to drive any additional or material costs.

d. *"External Technology Plan"* can be delayed given stakeholder interest in seeing a reduction in the trading charge.

AESO Response

The External Technology Plan is about how the AESO effectively ensures we are engaged in new technology developments that can impact/influence the electricity value chain. We are working through a plan and a process for us as an AESO to deliver on this need, and ultimately engage with industry and stakeholders on our views of these technology developments, potential impacts to our electricity industry and AESO mandate. Further, this plan is about how we would facilitate the integration of these new technologies into our network, markets, etc. This initiative has limited impact on current year operating costs.

We would appreciate seeing a revised budget and trading charge after you have considered these revisions.

AESO Response

IPPSA's input on the prioritization of its policies is noted.

Industrial Power Consumers Association of Alberta ("IPCAA")

1. **Capacity Market Costs**: Can the AESO provide stakeholders with a break-down of what the capacity market initiative cost, including capital costs?

AESO Response

The estimated total costs, general and administrative and capital, related the capacity market were $37.0 million. The current estimate of capacity market costs for 2017 – 2019 is broken down as follows:

Consulting and Legal	**$10.3 million**
Internal Labor	**$12.8 million**
Capital Costs	**$10.7 million**
Other Industry	**$ 3.2 million**

2. **FTEs**: Can the AESO provide an FTE count by group pre- and post-capacity market?

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

AESO Response

The following table displays the current FTE count (capital and general and administrative) at December 31, 2019 as compared to the FTE count at December 31, 2016. It is important to note that different divisions will take on different departments and activities throughout the years. In addition, re-organizations result in modified, combined or separated departments and related strategic focus. The decrease in Grid and Market Operations staff that occurred over the 2016 to 2019 period was the result of significant transmission development projects that were completed. In addition, analysis of coal generation phase out accompanied by large renewable generation forecasts were completed. FTE's were re-allocated to other departments.

Other significant differences include the reliance on third-party services from year to year. Increases in IT FTE's were primarily related to the conversion of 22 consultants who were converted to employees. The conversions were undertaken to reduce costs (lower employee costs versus consulting fees). This reduced consulting costs and increased staff count. Without this shift, the 2019 FTE count would be 435 FTE's, a difference of 5 from the December 31, 2016 count. In addition, certain CIP and corporate security roles were centralized into IT in this timeframe, further contributing to the difference.

Markets and Commercial increases are due to additional accountabilities of managing the Fort McMurray West and Renewable Electricity Program commercial agreements, transfer of the management of long term ancillary service procurement processes and agreements from Operations, and an increased focus on tariff design and data analytics.

Increases in the In-training, Student, Retire department reflect retirements that were a part of the re-organization and will take effect in January 2020.

Another factor is the vacancies that exist at any point in time. As of December 31, 2016 the 430 staff count reflects 15 vacancies from the budgeted FTE's of 445. This is a driver of differences in Market, Legal and Human Resources FTE's. For example, there were 10 vacant positions as of December 31, 2016 for Markets and Commercial. The December 31, 2019 staff count reflects a vacancy of only 5 FTE's from the 2020 budget.

Therefore, the below chart is not the best indicator of the shift in work or activity.

	Capacity Market	
	Pre	**Post**
Grid and Market Operations	207	183
Markets and Commercial	35	45
LAW and Communications	40	38
IT	77	106
Finance	38	43
HR and In-Training, Retire	21	31
Executive Office	12	11
	430	**457**

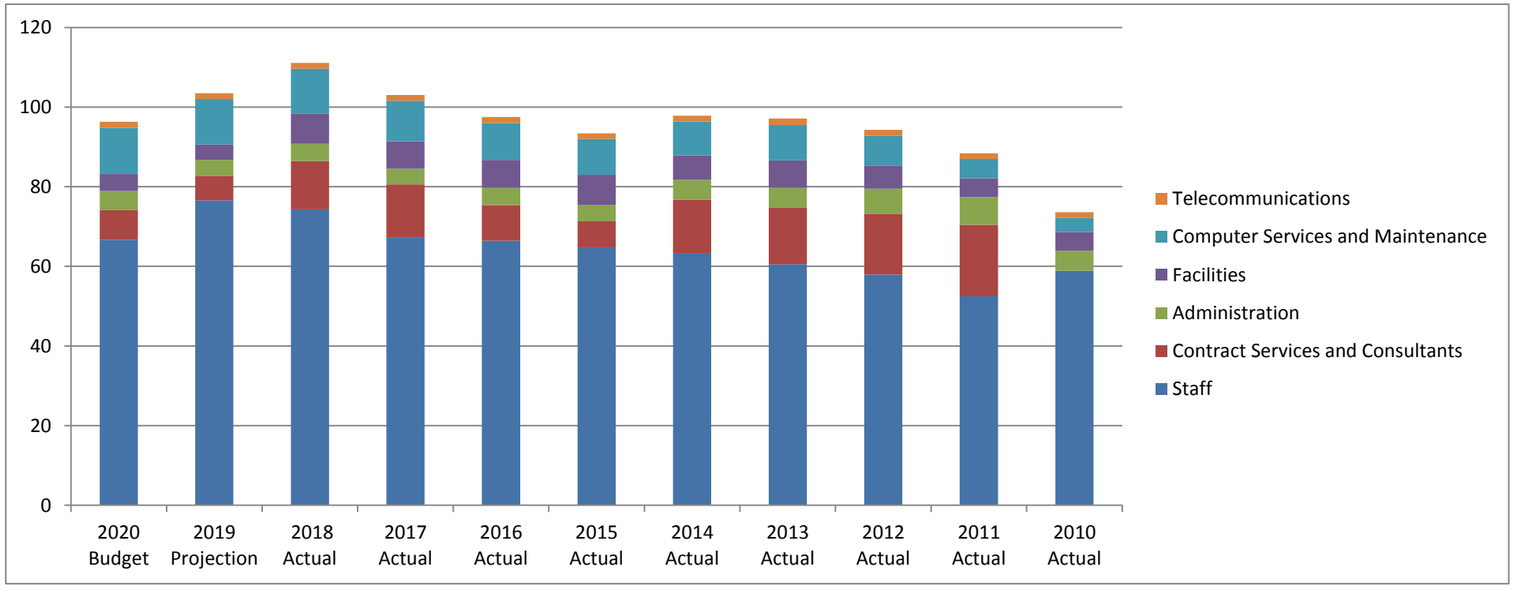
AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

3. **General and Administrative Costs**: Can the AESO provide a graph of AESO General and Administrative Costs for the past 10 years? IPCAA notes that the 2020 preliminary G&A budget is $97.4M. The AESO should consider including this as part of their tariff for review by the AUC process going forward. At $100M, G&A should be subject to an external review process. There should be a limit to the consumer costs that can be approved without regulatory review.

AESO Response

Stakeholder consultation through the BRP was established to find efficiencies to facilitate the regulatory process with respect to the approval of the AESO's Own Costs. The *Transmission Regulation* establishes several relevant provisions in this regard. The BRP participants comprised of the AESO and stakeholders began this process in 2005 to provide stakeholders with greater transparency of the AESO's planning processes and an increased understanding of the operations of the organization. Also, this process facilitates the AESO Board receiving stakeholder comments prior to making a decision in respect of the AESO's budgeted Own Costs, forecasted Ancillary Services costs and forecasted Transmission Line Loss costs. The AESO is committed to providing transparency and allowing for a comprehensive review of its Own Costs through the BRP. The AESO does not intend to submit these costs for AUC approval.



4. **Proposed salaries adjustment**: $2M (slide 33). IPCAA is concerned that the proposed salaries adjustments do not reflect the current economic climate in Alberta. Alberta companies continue to undergo considerable lay-offs and salary freezes. As an enabler of economic development, service providers in the electricity sector should be sensitive to that fact.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

AESO Response

Please see AESO's response to "Heartland's" comment, above.

5. **AUC Fees**: Is it possible to see a breakdown of the AUC's 2020 Energy Market Fees ($8.3M, slide 35)?

AESO Response

The AUC fee was based on the Administration Fee Package received from the AUC for 2019. The AUC's fiscal year end is March 31, so the latest 2019 Administration Fees received are for the period March 31, 2019 to December 31, 2019. The AESO estimates the budget amount using the prior year's actual AUC Administration Fee. As the 2020 Administration Fee had not yet been received from the AUC, the trading charge will be based on the best estimate the AESO has at the time the budget is finalized The AESO does not receive any further detail on the fee, only the amount the AESO is required to pay.

6. **Energy Market Trading Charge**: Can the AESO provide the volume that is expected to be pay the energy market trading charge? IPCAA is concerned that if the AESO has over-forecast the volume, it will mean an under-collection of the costs.

AESO Response

The volume utilized in Preliminary Forecast and Budget Information was 134,405,000 MWh and is based on the expected growth in System load applied to historical settled volumes. Please see AESO's response to "ADC's" comment, above in the first section as stated the AESO tested a lower system load forecast for 2020 which accounts for the 2019 load decline; however, this lower system load forecast did not result in a material change to the energy market trading charge.

TransAlta Corporation ("TransAlta")

TransAlta requests the AESO to provide a more detailed breakdown of Full Time Equivalents (FTEs) and costs by area for 2020 Budget versus actuals in 2014, 2015, and 2016 (pre-Capacity Market). We also ask to more information about the consulting budget and what initiatives and work the consultants are being used for in 2020. We wish to more fully understand how the AESO's recent re-organization and staff cuts have impacted the AESO to appreciate how these changes may impact the AESO's performance compared to "normal" years.

AESO Response

The tables` below presents FTE counts for the 2020 Budget and as of December 31st for 2019, 2016, 2015 and 2014, as well as General & Administrative costs for the same periods. As noted in a previous response to "IPCAA", above, it is important to note that different divisions will take on different departments and activities throughout the years. In addition, re-organizations result in modified, combined or separated departments and related strategic focus. Please refer to the "IPCAA" comment for a discussion of significant causes for FTE variances.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

FTE's	2020 Budget	2016	2015	2014
Grid and Market Operations	191	207	189	190
Markets and Commercial	46	35	34	41
LAW and Communications	39	40	55	47
IT	107	77	73	67
Finance	46	38	25	20
HR and In-Training, Student, Retire	24	21	25	12
Executive Office	9	12	19	33
	462	**430**	**420**	**410**

(in millions)	2020 Budget	2016 Actual	2015 Actual	2014 Actual
Operations	25.1	20.2	17.6	19.2
Transmission	5.7	14.8	14.8	14.7
IT	25.2	21.6	20.5	20.2
Markets	7.0	5.2	4.3	11.1
Commercial	2.1	3.7	2.5	0.0
Communications	1.8	2.6	2.6	2.7
Finance *	13.0	15.0	12.5	10.5
Human Resources	3.2	4.2	4.5	4.4
In-Training, Student, Retire	3.1	1.0	1.3	0.0
Executive Office	4.5	4.8	5.9	7.2
Legal	4.8	3.6	6.3	5.5
AESO Board	0.7	0.7	0.6	0.6
	96.2	97.5	93.4	96.1

** Includes rent and facilities costs*

The need for consulting services is based on an assessment of required resources both internally and externally and is 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.**

Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

These services encompass such items as IT application administrator support, IT penetration testing, TPL compliance assessments, geomatics disturbance assessment, audit services (internal, CIP and WECC), market simulation studies, VOLL studies, vendor support for IT system sustainment and improvement projects, loss factor calculation support, jurisdictional and tariff design review and project management support. This category also includes legal counsel retained to support general business operations by supplementing in-house legal resources and to provide expertise on regulatory filings and more complex commercial matters. These are just a few of many consulting services utilized by the AESO, but it should provide a sense of the specialized nature of some activities and costs to be incurred in 2020. Refer to AESO's response to "IPCAA's" comment on general and administrative costs. You will see that consulting spend anticipated for 2020 is less than any of the prior 10 years of historical results, outside of 2015 and the projection for 2019. The AESO has historically relied on consulting costs to meet the resource requirement needs of the organization and has been reduced in a concerted effort to reduce costs.

Need to Explore More Cost Savings

We understand that the AESO has reduced staff and contract service and consultant costs from the 2019 Approved Budget level but we remain concerned that market participants that the trading charge is still expected to reach its highest level in recent history. The AESO's preliminary estimate show an increase in the trading charge from 42.5 to 42.6 cents per MWh despite the actions it has undertaken thus far. While we appreciate that this is partly due to deferred costs associated with the capacity market work done in 2017-2019, we ask for further spending restraint to reign the trading charge in. To this end, we wish to explore actions that the AESO can undertake to reduce the scope of activities and delay discretionary business initiatives to achieve cost savings.

For example, the $2 Million proposed salary adjustment should be removed. This adjustment is not only inconsistent with the actions being taken by industry and government, which are freezing salaries and reducing staff levels, it is also inconsistent with the actions the AESO has taken to reduce staff levels to reduce staff costs.

AESO Response

Please see AESO's response to "Heartland's" comment above regarding the proposed salary adjustment and our response to "ENMAX" regarding cost savings.

Utilities Consumer Advocate ("UCA")

The AESO references the Distributed Energy Resources Roadmap (DER) among its budgetary considerations. To date, the UCA is not aware of any publication already published or to be published by the AESO with regards to this subject. The UCA seeks more clarity with regards to this budget item, specifically if it is part of the AESO's submission to the AUC as part of Proceeding 24116: Distribution System Inquiry. Will there be stakeholder consultations? Is there a schedule? How much is expected to be spent on the DER Roadmap and what aspects of DERs will it address?

AESO Own Costs Budget for 2020
Do stakeholders have any comments on the 2020 Preliminary General and Administrative Budget information presented?

AESO Response

The AESO considers the evolving transformation of the distribution system and distributed energy resources as a key change in our industry having implications on our several areas of the AESO mandate, including Alberta Interconnected Electric System (AIES) reliability, markets, tariffs and transmission planning. As such our engagement in the AUC Distribution Inquiry, our DER Roadmap and our pending engagement in the distribution coordinated planning framework are all core to our business. This incremental work is cross functional across our business and is being absorbed within existing resources through prioritization. As such, there is not a single budget line item. The AESO provided a presentation of the AESOs DER Roadmap at the AUC Distribution Inquiry Module 1 technical conference. The DER Roadmap requires alignment and coordination with the DFOs and as such the AESO started engagement with the DFOs to align on scope and to obtain DFO input. The AESO has initiated some work around internal AESO processes and areas which affect the reliability of the AIES. The AESO will provide publically a more detailed DER Roadmap in 2020 and will engage stakeholders as we progress through 2020 with our work.

In addition, the AESO is requesting $2M dollars be approved as part of its budget for salary adjustments. Given high levels of unemployment in Alberta among professionals with energy sector experience, including reductions at the AESO, who are the salary adjustments targeted towards, and how were the recommended increases determined? The UCA recommends the AESO Board disallow the proposed salary adjustments.

AESO Response

Please see AESO's response to "Heartland's" comment regarding the proposed salary adjustment, above.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary Capital Budget information presented?

Alberta Direct Connect ("ADC")

No Comments

Heartland Generation Ltd. ("Heartland")

HGL would find it helpful if the AESO could provide a profile of expected project costs over time for multi-year projects, e.g. what costs are expected and budgeted in 2020, 2021, and 2022 of a three-year project.

AESO Response

The AESO provides full project forecasts to stakeholders for multiple years for major projects, for example the SCC Expansion. The AESO does not have any major projects budgeted or planned starting in 2020. At this point, the AESO expects capital budgets for 2021 and 2022 to be similar to the 2020 proposed capital budget, unless any major / significant capital initiatives are deemed to be required.

Overall, HGL and assumedly other stakeholders have questions regarding some of the topics introduced as part Preliminary Capital Budget:

• "Forecasting software" as part of business technology solutions – productivity: The AESO already has Aurora software, what forecasting software does this relate to?

AESO Response

The forecasting software identified in business technology solutions refers to short term (one hour to 14 days ahead) load forecasting software improvements required to account for new technologies including behind-the-meter solar and other DER.

• The AESO has also included "Market participant portal", it is not clear what capital initiative this relates to or what it is?

AESO Response

The "market participant portal" is currently planned as a project to design and implement a portal to enhance the cybersecurity posture and the compliance requirements of the external compliance monitoring function with external AESO market participants. The portal will provide a secure exchange of data, storage, tracking, reporting and management of participant information. Also included as part of the project is a document workflow solution to allow market participants to submit compliance evidence to the AESO in a secure and confidential manner that meets new CIP standards and further addresses increasing cybersecurity risks related to communication over the internet.

Industrial Power Consumers Association of Alberta ("IPCAA")

No comments at this time.

AESO Own Costs Budget for 2020

Do stakeholders have any comments on the 2020 Preliminary Capital Budget information presented?

TransAlta Corporation ("TransAlta")

TransAlta would like more information about how the $10.8 Million for the capital initiative was spent and whether that capital work has any application to the energy-only market.

AESO Response

To support the capacity market the capital costs mainly related to the following projects:

- **Calculation of Unforced Capacity (UCAP) of market participants**
- **Capacity market auction solution(s) encompassing pre-auction, auction and rebalancing**
- **Settlement and performance**
- **Related energy and ancillary service market changes**

None of the projects with costs related to the capacity market capital amount of $10.7 million have an application in the energy-only market. Please note the associated amount above was $10.7 million, not $10.8 million.

We would also like further information on the Energy Management System sustainment capital. As noted by the AESO, the EMS project was put on hold so there was no capital spent in 2017 and 2018. We'd like to understand if the $4.8 Million to be spent in 2020 is the end of the sustainment project spending. In the event that it is not, we would like to better understand how the 2020 Budget spends fits within the multi-year spending expected on the system. More specifically, what is the capital being spent on and how that changes the functionality of the EMS for the AESO and market participants.

AESO Response

The EMS sustainment was initiated in 2018 with the completion of definition work for EMS Core and these associated costs formed part of the general capital budget in 2018. Additional information regarding the EMS sustainment program is provided in the *AESO 2020 Business Plan and Budget* document published to the AESO website January 15, 2020. The EMS sustainment project is not on hold, rather the AESO has slowed down the implementation of the sustainment so it can ensure it delivers a sustainable EMS investment plan supporting future energy and AS market requirements.

TransAlta also asks if the CIP and cyber and physical security advancements are part of on-going capital spend or are one-time projects.

AESO Response

CIP and cyber physical security advancements are not a one-time project. The AESO believes such cost will be part of the capital budget for 2021, 2022 and beyond as ensuring ongoing compliance with existing and new Critical Infrastructure Protection standards as well as ensuring protection against continually changing cyber security risks are known as ongoing requirements.

We would also like to understand the breakdown of the applications and tools in the Productivity Application and Tools category that make up the $3.3 Million in 2020. The AESO had mentioned that some of the spending in this category is related to upgrades to Windows 10 but we are unclear what the other applications and tools are and how much of this total spend they account for. We would like to understand the cycle for this type of spending (if this occurs every 4 years). It would be helpful to understand the amount per workstation or FTE.

AESO Own Costs Budget for 2020
Do stakeholders have any comments on the 2020 Preliminary Capital Budget information presented?
AESO Response **The majority of the $3.3 million is associated with the Windows 10 & Office Suite Upgrade. Also included in this capital cost are the mobile device program as well as various other personal productivity enhancements relating to email and collaboration technology. There are various cycles depending on the technology component involved. The hardware refresh cycle is every 4 years and the operating system cycle is every 8 years (e.g. the previous upgrade to Windows 7 concluded in 2012). The email/collaboration cycle is approximately every 6 years. Measuring cost by workstation or FTE is not a suitable measure as some of these upgrades apply to the control center and are used to manage the critical operations of the Alberta grid and market (i.e. a much larger user base than the AESO staff base). Having said that, at 900 workstations, the cost per workstation of this total 2020 investment is approximately $3,667 and includes hardware, software, and labor to implement, migrate and regression test all critical and corporate business systems.**

Other Comments Submitted

Capital Power Corporation ("Capital Power")

For future BRP consultations, Capital Power submits that a review of the process may be appropriate to ensure the dialogue with stakeholders is constructive. Specifically, stakeholders lack an appropriate forum to provide input to the AESO on the priority and scope of strategic initiatives. The specifics of these initiatives attract significant attention from stakeholders, however, the BRP is not setup to test the details of this work. Stakeholders are left to comment on a budget for which details are not available. Capital Power would welcome a discussion with the AESO on how the process could be changed to accommodate this request.

ENMAX Corporation ("ENMAX")

Improvements to the AESO's Budget Review Process (BRP)

ENMAX suggests that the AESO review its current BRP to identify improvements to ensure transparency and that meaningful stakeholder engagement is taking place.

Participant involvement early on in the process is key. Prior to the commencement of the BRP, parties should have a reasonable opportunity to review the AESO's priorities and comment on whether there are areas of overlap or revisions that could be made to further reduce costs. Overall, transparency of the AESO's costs and how they relate to a specific initiative is integral for stakeholders to understand the relevance and appropriateness of the costs being proposed.

Materials should also be circulated to stakeholders well in advance of a meeting to ensure parties are provided with enough time to review and understand the information being presented.

Independent Power Producers Society of Alberta ("IPPSA")

IPPSA wishes to provide the following comments on the Budget Review Process (BRP) and on the content of the November 29 presentation.

In terms of the BRP process going forward, we recommend that the BRP – or perhaps another stakeholder vehicle such as a future iteration of the Market Advisory Committee – work in concert with the Alberta Electric System Operator (AESO) to identify and define the AESO's key objectives and new spending initiatives. This would allow stakeholders to fully understand what these initiatives are and ideally to offer their support for them.

We would also recommend that at this stage of budgeting the AESO provide cost estimates for each key initiative. This would enable stakeholders to work with the AESO in determining if those are appropriate priorities trading off against the AESO's proposed budget and trading charge. It would also be useful to invite the executives responsible for markets and transmission to future BRP meetings so that stakeholders can appreciate the scope of the items that they have proposed. Such a meeting would include defining the outcomes and KPIs of each initiative so that stakeholders could measure delivery of each initiative over the budget year.

Other Comments Submitted

TransAlta Corporation ("TransAlta")

Improvements to Future Budget Review Processes

TransAlta asks that the business initiatives are reviewed in a separate process prior to the budget review process. The executive sponsors and management responsible for the business initiatives should consult with industry stakeholders and provide an explanation for the need for the initiative and present the expected benefits and alternative considered in addition to the expected costs and staffing requirements to deliver the business initiative.

The budget review process does not provide sufficient information to understand the business initiatives or how they related to the budget presented. For example, basic information such as the costs or staff requirements associated with each business initiative are not provided in the budget process. Rather, the business initiatives are just a list of things the AESO does or hopes to do with the budget that they provide. It is our understanding that business cases and more detailed information for the business initiatives are developed after the budget review process. We disagree that this approach is a good practice (business initiatives should be more fully developed before they are included in the budget) or provides a reasonable opportunity for stakeholders to provide meaningful input in the budget review process.

AESO Response

The AESO thanks all of the stakeholders for their proposed process improvements and will consider all of the above comments and perform a review of the BRP in 2020 to better meet the needs of its stakeholders.