Memo

To: AESO Board
From: Vice-President, Finance
Date: November 7, 2016
Subject: **AESO 2017 Business Plan and Budget Proposal**

Enclosed is the AESO 2017 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 2017 business initiatives (continued from 2016);
- The proposed 2017 budgets/forecasts for:
  - wires costs;
  - transmission line losses costs;
  - ancillary services costs;
  - other industry costs;
- The proposed own costs budgets (i.e., general and administrative, interest costs, amortization and capital) for the six-month period from January 1 to June 30, 2017.

At the December AESO Board meeting, AESO Management will be requesting that the Board approve, or amend and approve, as appropriate, the items outlined in Section 1 of this document.

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

Yours truly,

Todd Fior
Vice-President, Finance

cc: David Erickson, President and Chief Executive Officer
Greg Spence, Director, Business Planning
Carol Moline, Director, Accounting and Treasury
Interested Stakeholders

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AESO 2017 Business Plan and Budget Proposal

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Section 1

Board Decision Items - Executive Summary

As the planning and assessments for the AESO's *2017 Business Plan and Budget Proposal* (Business Plan) were set to begin in the summer of 2016, Management determined that additional government policy decisions related to the implementation of the Government of Alberta's Climate Leadership Plan (CLP) would be forthcoming, which may materially impact AESO operations in 2017. Since the release of the CLP occurred in late 2015, the AESO has been working with the government to assist with the implementation of certain components of the CLP.

The uncertainty associated with CLP initiatives impacts the AESO's 2017 business initiatives and own costs[1], allowing for the forecasts for transmission operating costs[2] to proceed similar to prior years. While we await further government direction to assess the impact to our operations, we will continue to advance 2016 in-progress business initiatives while maintaining our day-to-day operational activities in 2017. We believe this can be achieved within the current level of expenditures, essentially extending the 2016 budget into the early part of 2017. We are providing 2017 full-year forecasts for wires, transmission line losses and ancillary services costs forecasts for AESO Board approval. In the spring of 2017, a more detailed 18-month business plan for the period from July 2017 to December 2018 will be prepared, consulted on and presented to the AESO Board.

This Business Plan provides an overview of our proposed business initiatives that will enable us to continue to meet our mandate[3] and advance our strategic plan.

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 at times challenged before we reach this point. 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 the feedback that the AESO received during the stakeholder consultation. 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.

The following are the approvals that we will be requesting from the AESO Board.

[1] general and administrative, capital, interest and amortization

[2] wires, ancillary services, transmission line losses, other industry

[3] 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 2017 business initiatives as outlined in the Business Plan.

2. Approve the following proposed 2017 budget and forecast amounts as outlined in the Business Plan and summarized as follows:

Budget/Forecast Category	Revenue Source ($ million)					
	Trans-mission	Energy Market	Renewables	Load Settlement	2017 Budget	
General and Administrative[1]	34.4	12.8	1.9	0.6	49.7	#
Interest[1]	(0.1)	0.3	0.0	0.0	0.2	#
Amortization[1]	7.9	4.2	0.0	0.1	12.2	#
Other Industry[2]	15.6	7.7	-	-	23.2	
Wires[3]	1,729.3	-	-	-	1,729.3	
Transmission Line Losses[4]	74.1	-	-	-	74.1	
Ancillary Services[4]	118.9	-	-	-	118.9	
Total Operating Costs	1,980.1	25.0	1.9	0.7	2,007.6	
Capital[5]					15.4	#
Total Budget	**1,980.1**	**25.0**	**1.9**	**0.7**	2,023.0	

Differences are due to rounding

Details provided on the following Pages in the Proposal (Section II: [1]Page 19, [2]Page 17, [3]Page 14, [4]Page 15, [5]Page 20).

# Indicates a six-month budget amount

Section 2

Stakeholder Presentations to the AESO Board

The typical process for stakeholder engagement was amended for the 2017 BRP to ensure that both the stakeholder consultation and AESO Board approval processes remain efficient and meaningful while the AESO is awaiting additional government policy decisions related to the implementation of the Climate Leadership Plan. The AESO's 2017 business initiatives and own costs[1] budget may be impacted by these decisions which has limited the assessment for these areas to six months ending June 30, 2017. The 2017 BRP includes a full-year forecast of transmission operating costs.

Given these circumstances, we have chosen to amend the BRP with the following changes:

- No new business initiatives are introduced for 2017 at this time.
- The general and administrative, interest and amortization budgets are proposed at 50 per cent of the 2016 budget to provide approved funding for the first six months of 2017.
- The capital budget is proposed for a six-month period.
- In-person stakeholder consultation meetings (technical consultation) were replaced with enhanced written documentation provided to stakeholders followed by written stakeholder questions and published AESO responses.
- Stakeholder presentations to the AESO Board were not requested due to the limited content on business initiatives and own costs; the AESO Board will review stakeholder comments in consideration of its final Board decision.

Management intends to return to the regular BRP consultation process in the spring of 2017 to consult with stakeholders on a more detailed 18-month business plan for the period from July 2017 to December 2018 prior to requesting AESO Board approval.

Stakeholder comments and AESO responses can be found in Section 5 of this document.

[1] general and administrative, capital, interest and amortization

Section 3

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 we have 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, we make a recommendation with respect to our 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.

We have posted 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). 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 our responses have been posted on the AESO's website. Through this process, we have ensured that 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)

The typical process for stakeholder engagement was amended for the 2017 BRP to ensure that both the stakeholder consultation and AESO Board approval processes remain efficient and meaningful while the AESO is awaiting additional government policy decisions related to the implementation of the Climate Leadership Plan. As a result of this, Management has limited the assessment and consultation of business initiatives and AESO own costs[2] to the first six months of 2017 while providing a full-year forecast of transmission operating costs[3]. It is Management's intention to consult in the spring of 2017 on a more detailed 18-month business plan for the period from July 2017 to December 2018 prior to requesting AESO Board approval.

As a direct result of this process change for 2017, Management chose to replace in-person stakeholder consultation meetings (technical consultation) with enhanced written documentation provided to stakeholders, followed up with written stakeholder questions and published AESO responses. Management intends to return to the regular BRP consultation process, which follows each principle of the Terms of Reference noted below, in the spring of 2017.

The following Terms of Reference were last provided to stakeholders in July 2016.

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 BRP cycle, the AESO and stakeholders will evaluate the effectiveness of the process and make appropriate changes if required for the following year.

[2] general and administrative, capital, interest and amortization

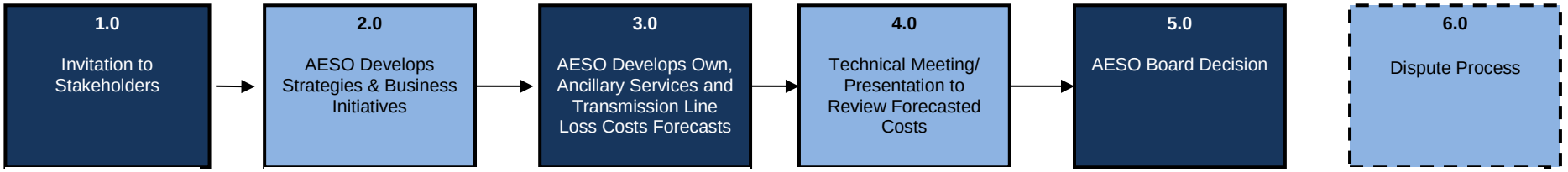
[3] wires, ancillary services, transmission line losses, other industry

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 Independent System Operator (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 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 year

- AESO prepares Own Cost forecast for the upcoming year 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

- AESO publishes its business initiatives, forecasts/budgets, including assumptions
- Stakeholders provide written comments to which the AESO responds in writing
- AESO makes revisions as deemed necessary
- AESO prepares an AESO Board Decision Document and provides it 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
- AESO Board considers stakeholder comments (written and verbal provided to the AESO Board, if applicable) and Management's responses 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 –

Budget Review Process Schedule

Consultation Material Distributed
Stakeholder Comments Requested
Stakeholder Comments Received
AESO Posts Comments/Response Summary

SEPTEMBER

Mon	Tues	Wed	Thurs	Fri
			1	2
5	6	7	8	9
Holiday				
12	13	14	15	16	
	Distribution – Notice Change to the AESO's 2017 BRP			
19	20	21	22	23
26	27	28	29	30
		Distribution – Letter Update of Changes to 2017/18 BRP		

OCTOBER

Mon	Tues	Wed	Thurs	Fri
3	4	5	6	7
10	11	12	13	14
Holiday			Distribution – AESO's 2017 Business Initiatives, Forecasts, and Own Costs Presentation (Step 2&4)	Request Comments on Business Initiatives, Forecasts and Own Costs (Step 2&4)
17	18	19	20	21
24	25	26	27	28
Receive Comments on Business Initiatives, Forecasts, and Own Costs (Step 2&4)				
31				

NOVEMBER

Mon	Tues	Wed	Thurs	Fri
	1	2	3	4
	Web posting of Comments on Business Initiatives, Forecasts, and Own Costs Step (2&4)			
7	8	9	10	11
Distribution – AESO's 2017 Business Plan and Budget Proposal (Step 4)	Request Comments on Business Plan and Budget Proposal (Step 4)			Holiday
14	15	16	17	18
		Receive Stakeholder Comments on Business Plan and Budget Proposal (Step 5)		
21	22	23	24	25
			Web posting of Comments on Business Plan and Budget Proposal (Step 5)	
28	29	30		

Section 4

AESO 2017 Business Plan and Budget Proposal

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2017 Business Plan

Following the release of the Government of Alberta's Climate Leadership Plan (CLP) in late 2015, the AESO has been working with the Government of Alberta to assist with the implementation of certain components of the CLP. The CLP is the foundation for a comprehensive set of policy measures to reduce Alberta's greenhouse gas emissions. In 2016, the AESO was tasked by the provincial government with two main activities in support of meeting its CLP objectives: provide expertise to assist with the successful phase-out of coal-fired emissions and develop, implement and administer a Renewable Electricity Program in Alberta.

As the planning and assessments for the AESO's *2017 Business Plan and Budget Proposal* (Business Plan) were set to begin in the summer of 2016, Management determined that additional government policy decisions related to the implementation of the CLP would be forthcoming, which may materially impact AESO operations in 2017. Management wants to ensure that both the stakeholder consultation and AESO Board approval processes are efficient and meaningful, which will require additional time for government decision-making to occur and the subsequent impact assessment by the AESO to incorporate policy changes into the Business Plan.

With this in mind, Management has taken the unique approach for the 2017 Budget Review Process (BRP) to propose a full-year forecast of transmission operating costs[1] while limiting the assessment and consultation of business initiatives and AESO own costs[2] to the first six months of 2017. It is Management's intention to consult in the spring of 2017 on a more detailed 18-month business plan for the period from July 2017 to December 2018 for business initiatives and the AESO own costs budget prior to requesting AESO Board approval.

The following 2017 Business Plan updates the business initiatives that began in 2016 to indicate the progress that has occurred and the plans for the upcoming year. At this time, there are no material changes to the AESO's business focus planned for 2017. With respect to the 2017 own cost budget, Management has proposed a six-month budget to allow for continued operations at the current level of expenditures. Essentially, Management is anticipating that AESO operations will continue as-is into the early part of 2017. To execute its mandate, the AESO is proposing a six-month general and administrative budget of $49.7 million and a capital budget of $15.4 million for the period from January to June 2017.

Stakeholders' input continues to be essential to ensure a transparent and thorough BRP. The AESO shared details of this 2017 BRP with stakeholders in October 2016 and sought feedback through written submissions.

[1] wires, ancillary services, transmission line losses, other industry
[2] general and administrative, capital, interest and amortization

AESO Operations

During 2014, the AESO completed the *2014-2018 Strategic Plan* which established the strategies charting the AESO's intended direction over the five-year period. On an ongoing basis, the AESO pursues three key objectives: build on the success of the current electricity framework; provide value to Albertans as an organization; and retain and attract the right people. Refer to Appendix A for additional details on the three strategic objectives from the AESO's strategic plan.

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

- Electric System Operations
- Electric System Development
- Customer Access Services
- Market Development
- Corporate Services

The following pages provide a brief update on the progress and plans for the ongoing 2016 business initiatives by key process. In February 2016, the AESO Board approved the initiation of the activities related to the CLP through a 2016 budget amendment[3].

[3] AESO Board Decision 2016-BRP-001, Amended 2016 General and Administrative Budget

Electric System Operations

Optimal management of electric system operations continues to be 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.

ACHIEVEMENTS AND PLANS BY ACTIVITY

The following table outlines the notable achievements completed or expected to be completed in 2016 with an update of these initiatives for 2017 categorized by activity group.

Real-time Operations	Operations Business Services	Operations Engineering	Operations Systems
2016 Achievements			
Migration initiated for implementation of wide area network (WAN)/ supervisory control and data acquisition (SCADA) replacement project Developed draft strategy for telecom task force	Advanced Critical Infrastructure Protection (CIP) standards implementation Developed internal CIP process and procedure requirements Initiated system coordination centre (SCC) expansion design activities (completed definition phase)	General operations focus	Continued to advance system build activities (implementation phase) for the energy management system (EMS) upgrade project Completed replacement infrastructure procurement and configuration for EMS Completed factory acceptance testing for EMS
2017 Plans			
Continue/complete Independent Power Producer migrations to WAN/SCADA Establish industry telecom task force	Complete CIP internal compliance requirements and related audits; establish market participant compliance program Initiate implementation phase for SCC expansion project	General operations focus	Complete EMS upgrade project implementation

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.

Included as a new activity in 2016 is the support provided to the provincial government's Coal Secretariat and Coal Facilitator through reliability assessments and operational knowledge. This ongoing support will ensure the reliability of Alberta's electricity grid is maintained while phasing out coal generation in Alberta.

ACHIEVEMENTS AND PLANS BY ACTIVITY

The following table outlines the notable achievements completed or expected to be completed in 2016 with an update of these initiatives for 2017 categorized by activity group.

Plan to NID Approval	System NID Approval to Energization	Maintenance	Assessment
2016 Achievements			
Advanced projects identified in the *2015 Long-term Transmission Plan* Updating the transmission rate impact projection (TRIP) in support of the general tariff application Filing the 2017 ISO Tariff Update application with the Alberta Utilities Commission (AUC) Prioritization and advancement of loss factor rule; Alberta Reliability Standards; and technical rules Ongoing participation in the loss factors and historical trading report (HTR) proceedings	Continued to integrate and manage the contract requirements for the Fort McMurray West (FMW) 500 kV transmission project; AUC regulatory proceedings, AESO involvement where applicable; preparation for debt funding competition Revisited the timing of the competitive process for Fort McMurray East 500 kV transmission project Implemented changes to ISO Rule 9.1 *Transmission Facility Projects*	General operations focus	Performed a comprehensive reliability assessment of critical factors associated with the transition away from coal-fired emissions Developed boundary conditions for a flexible coal retirement plan and mitigation measures

ACHIEVEMENTS AND PLANS BY ACTIVITY			
Plan to NID Approval	**System NID Approval to Energization**	**Maintenance**	**Assessment**
2017 Plans			
File the general tariff application with the AUC Continue to advance loss factor rule, Alberta Reliability Standards and technical rules Execute on loss factors and HTR proceeding outcomes	Continue to integrate and manage the contract requirements for the FMW project; develop programs to manage the FMW project post energization; implementation of debt funding competition	General operations focus	Continue to work with the government to advance the phase-out of coal-fired emissions and maintain reliability

Customer Access Services

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

ACHIEVEMENTS AND PLANS BY ACTIVITY

The following table outlines the notable achievements completed or expected to be completed in 2016 with an update of these initiatives for 2017 categorized by activity group.

Plan the Customer Connection	Connection Approval	Construction to Project Closure	Customer Management
2016 Achievements			
Continue to enhance connection process efficiency opportunities	Monitor Abbreviated Needs Approval Process (ANAP)	Monitor Market Participant Choice (MPC) process	General operations focus
2017 Plans			
Continue to enhance connection process efficiency opportunities	Continue to monitor ANAP	Continue to monitor MPC process	General operations focus

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.

Included as a new activity in 2016 is the assistance provided to the provincial government to develop a Renewable Electricity Program (REP) to incent the development of renewable sources of generation in Alberta.

ACHIEVEMENTS AND PLANS BY ACTIVITY

The following table outlines the notable achievements completed or expected to be completed in 2016 with an update of these initiatives for 2017 categorized by activity group.

Design and Create	Implement	Monitor
2016 Achievements		
Initiated consultation for Voluntary Extended Generator Withdrawal From Energy Market Merit Order program (Mothballing); filed expedited rule Reviewed impact of intermittent generation on operating reserve requirements and initiated related consultation Ongoing dialogue with BC Hydro regarding alternatives to mitigate joint scheduling constraints on BC-Alberta intertie Designed REP program to meet the Climate Leadership Plan objectives through a series of periodic procurements and careful consideration of the payment mechanism Sought feedback from industry and assessed other jurisdictions to identify related considerations Developed an efficient, flexible, sustainable program to incent renewables for the government's consideration	Initiated implementation and determined the integration plan of storage technology rules and system changes; continued to implement and monitor intertie restoration solutions including: – Implementation of available transfer capacity posting improvements Completed Market Systems Replacement and Reengineering (MSR) Project Implementation (iteration 1) activities to sustain reliability of existing systems	Monitored transmission constraints rebalancing successful implementation Continued to monitor and assess the ongoing stability of the market framework General operations

ACHIEVEMENTS AND PLANS BY ACTIVITY		
Design and Create	**Implement**	**Monitor**
2017 Plans		
Complete consultation and file permanent rule for Mothballing Continue ongoing dialogue with BC Hydro regarding intertie restoration First competition for the REP program is anticipated to launch in Q1 2017 with the first project to be in service in 2019	Tariff provisions for storage technology to be filed in the general tariff application in 2017 Complete MSR implementation activities (iteration 2); continue to sustain reliability of existing systems	Continue to monitor and assess the ongoing stability of the market framework and provide related recommendations General operations

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.

ACHIEVEMENTS AND PLANS BY ACTIVITY

The following table outlines the notable achievements completed or expected to be completed in 2016 and planned initiatives for 2017 categorized by activity group.

Corporate Management	People Management	Strategy
2016 Achievements		
Continued refinement and execution of strategic communications planning, and continually assess the effectiveness of communications policies and practices Completed AESO website design and build activities Continued to advance IT and cyber security program Performed ongoing reviews of AESO activities, processes and information technologies to determine where business efficiencies can be realized	Increased workforce capabilities by broadening knowledge across the organization including: – developing programs to support cross functional practices to meet current and future needs	Continued to advance strategic initiatives
2017 Plans		
Continue to assess effectiveness of communication policies and practices and refine, as required Continue to advance IT and cyber security program Perform ongoing reviews of AESO activities, processes and information technologies to determine where business efficiencies can be realized	Continue to increase workforce capabilities	Continue to advance strategic initiatives

Financial Highlights

As part of this 2017 Business Plan, the AESO is also presenting its 2017 budget that meets 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 two sections: Section I reviews the 2016 financial results for year-to-date August and Section II provides budget information for 2017. Additional information is included in Appendices B to G.

Section I – 2016

Costs

The following table provides a summary of costs as of August 2016 compared to the 2016 budget.

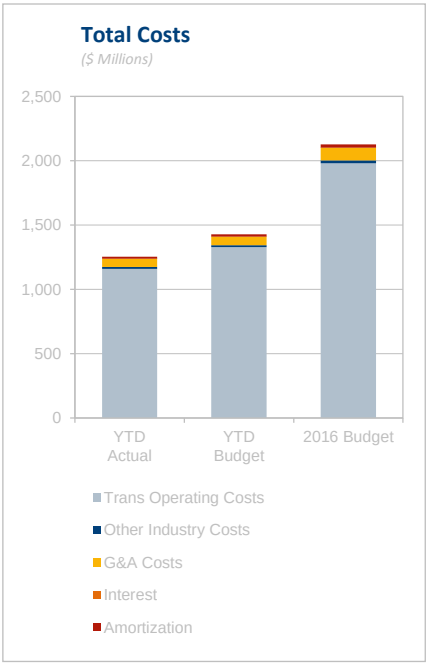
Year-to-Date August 2016 Costs ($ million) ~ by production year

	YTD August Actual	YTD August Budget	YTD August Variance	2016 Budget[4]
Transmission Operating Costs	1,158.3	1,328.1	(169.8)	1,979.3
Other Industry Costs	14.8	15.2	(0.4)	22.8
General and Administrative Costs	64.2	67.1	(2.9)	99.4
Interest	1.1	0.3	0.8	0.4
Amortization of Intangible and Capital Assets	15.3	16.2	(0.9)	24.4

Differences are due to rounding

The notable variance in the year-to-date results relates to transmission operating costs.

Additional information on year-to-date costs is provided in Appendix B (Year-to-Date August 2016 Financial Results Detail).



[4] Updated for AESO Board approval on February 18, 2016 for the 2016 general and administrative budget

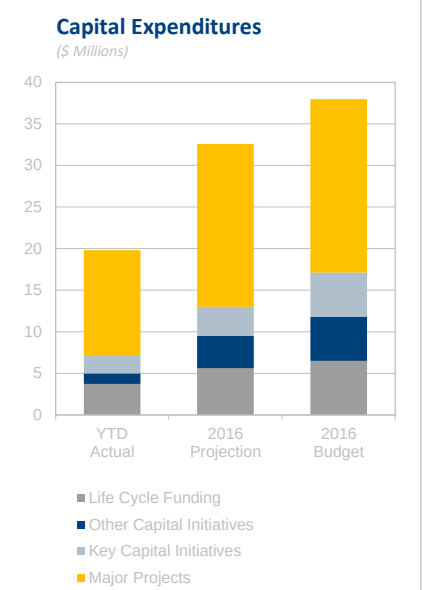
Capital Expenditures

The projected capital expenditures in 2016 are $32.5 million which is $5.5 million or 14 per cent lower than budget.

In general, the AESO's capital projects, which are predominately multi-year in nature, have continued to progress or have been completed in 2016. The anticipated year end variance is mainly due to the deferral of a number of projects, the most notable of these being the Oracle database refresh project, and timing differences related to the Energy Management System project.

The following table provides a summary of the current capital project investment for 2016.

Additional information on the status and progress of specific projects is provided in Appendix B (Year-to-Date August 2016 Financial Results Detail) and Appendix E (2017 Capital Projects).



Capital Expenditures ($ million)

	2016 YTD Aug Actual	2016 Remaining	**2016 Projected**
General Capital[5]	7.2	5.8	**13.0**
Major Projects[6]	12.6	7.0	**19.6**
Total Capital Spending	19.7	12.8	**32.5**

Differences are due to rounding

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

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

Section II – 2017

Financial Outlook

In planning for 2017, the following cost categories are reviewed:

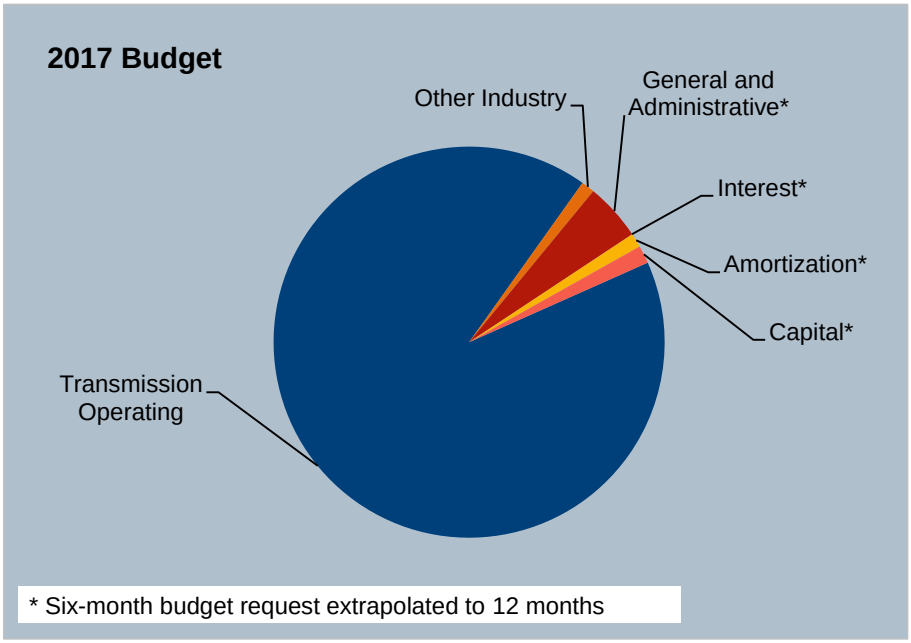
- Transmission Operating Costs (i.e., wires, transmission losses, ancillary services)
- Other Industry Costs
- General and Administrative and Interest Costs and Amortization
- Capital Expenditures

The focus of the following section is to highlight the changes from the 2016 budgets.

($ million)

	2017 Budget		2016 Budget
	6-month	12-month	
Transmission Operating Costs	-	**1,922.2**	1,979.3
Other Industry Costs	-	**23.2**	22.8
General and Administrative	**49.7**	-	99.4
Interest Costs	**0.2**	-	0.4
Amortization	**12.2**	-	24.4
Capital Expenditures	**15.4**	-	38.0

Differences are due to rounding



Transmission Operating Costs

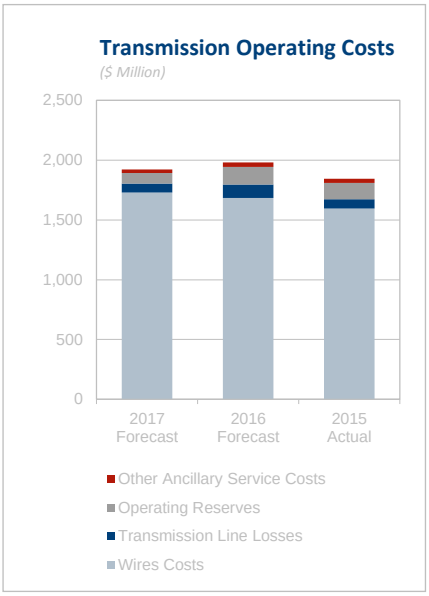
The following table provides a summary of transmission operating costs.

Transmission Operating Costs ($ million) ~ by production year

	2017 Forecast	2016 Projected	2016 Forecast	2015 Actual	2014 Actual
Wires Costs	**1,729.3**	1,706.0	1,684.8	1,596.0	1,364.5
Transmission Line Losses	**74.1**	44.4	111.9	75.8	119.5
Operating Reserves	**88.2**	64.3	147.1	137.3	180.9
Other Ancillary Service Costs	**30.7**	28.9	35.5	34.0	33.0
Transmission Operating Costs	**1,922.2**	1,843.5	1,979.3	1,843.1	1,697.9

Differences are due to rounding

Additional information on the 2017 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 Alberta Utilities Commission (AUC)-approved tariffs and are not controllable costs of the AESO.

The 2017 forecast for wires costs is $1,729.3 million, which is $23.2 million or one per cent higher than the 2016 projection of $1,706.0 million. The 2017 forecast is based on TFO tariffs ($1,723.9 million) and the AESO's forecast for Invitation to Bid on Credit (IBOC) and Location Based Credit Standing Offer (LBC SO) costs ($5.4 million).

The 2017 forecast is based on TFO tariffs approved or applied-for as of October 20, 2016 with the forecast reflecting: i) compliance filings for 2016 tariffs; ii) compliance filings for 2017 tariffs; or iii) AUC approvals for 2017 tariffs.

The AESO understands that the higher TFO tariffs reflect capital and operating costs associated with projects providing additional transmission system capacity as well as higher costs to operate and maintain existing transmission facilities.

Wires costs include long-term contracts related to IBOC and 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.

Transmission Line Losses

The 2017 forecast for transmission line losses is $74.1 million, which is $37.8 million or 34 per cent lower than the 2016 forecast cost of $111.9 million. Transmission line losses costs are projected to be $44.4 million for 2016.

The 2017 volume forecast is based on 2.3 terawatt hours of energy, which is 0.3 terawatt hours or 11 per cent lower than the 2016 forecast of 2.6 terawatt hours of energy; the 2016 projected volumes are 2.2 terawatt hours. The higher volumes in 2017 compared to the 2016 projection is due to a forecast increase in demand in 2017.

The average pool price used for the 2017 forecast is $32 per MWh which is 22 per cent lower than the 2016 forecast price of $41 per MWh.

Operating Reserves

The 2017 forecast for operating reserves costs is $88.2 million, which is $58.9 million or 40 per cent lower than the 2016 forecast cost of $147.1 million.

The 2017 operating reserves volume forecast is 7.3 terawatt hours, which is 0.7 terawatt hours or nine per cent lower than the 2016 forecast of 8.1 terawatt hours; the 2016 projected volumes are 7.5 terawatt hours. The lower volumes in 2017 compared to the 2016 projection is associated with lower standby regulating reserves.

The average pool price used for the 2017 forecast is $32 per MWh which is 22 per cent lower than the 2016 forecast price of $41 per MWh.

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

	2017 Forecast	2016 Projected	2016 Forecast	2015 Actual	2014 Actual
Load Shed Service for Imports	**18.1**	19.0	20.0	17.4	24.4
Contracted Transmission Must-run	**2.8**	-	-	-	-
Conscripted Transmission Must-run	**2.0**	2.0	4.0	9.7	4.7
Reliability Services	**2.9**	2.9	2.9	2.1	n/a
Poplar Hill	**2.8**	2.8	2.5	2.6	2.8
Black Start	**2.1**	2.1	2.1	2.1	1.0
Transmission Constraint Rebalancing	**0.1**	0.1	4.0	-	n/a
Other Ancillary Service Costs	**30.7**	28.9	35.5	34.0	33.0

Differences are due to rounding

The 2017 forecast for other ancillary services costs is $30.7 million, which is $4.8 million or 13 per cent lower than the 2016 forecast of $35.5 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). The 2017 forecast for LSSi costs is $18.1 million which is $1.9 million or 10 per cent lower than the 2016 forecast of $20.0 million due to considerations of the overall operations of the AIES, which impacts arming and tripping requirements, and lower LSSi volume availability in 2017.

The AESO anticipates entering into a new contract for transmission must-run services in 2017 to address reliability requirements.

Due to the unforeseeable requirements for conscripted transmission must-run and transmission constraint rebalancing, the forecast for 2017 is based on the projected 2016 cost as operational conditions in 2017 are anticipated to be similar to those experienced in 2016.

Other Industry Costs

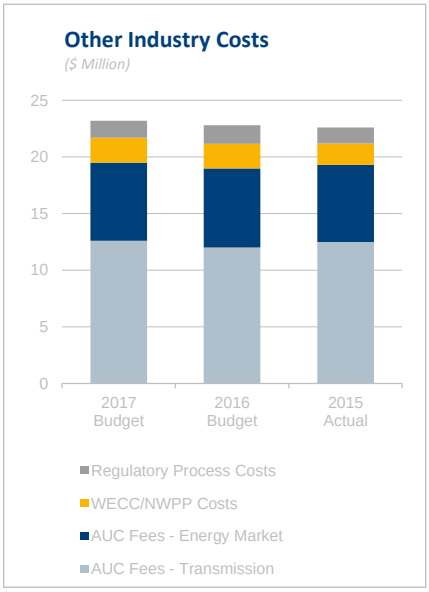
Other industry costs represent fees or costs paid based on regulatory requirements or membership fees for industry organizations; the amounts or requirement for the costs are not under the direct control of the AESO. These costs relate to regulatory process costs, the annual administration fee for the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

Other Industry Costs ($ million)

	2017 Budget	2016 Projected	2016 Budget	2015 Actual	2014 Actual
AUC Fees – Transmission	**12.6**	12.1	12.0	12.5	13.4
AUC Fees – Energy Market	**6.9**	6.6	7.0	6.8	7.0
WECC/NWPP Costs[7]	**2.2**	2.4	2.2	1.9	1.1
Regulatory Process Costs	**1.5**	1.3	1.7	1.4	1.5
Other Industry Costs	**23.2**	22.4	22.8	22.6	23.0

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 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 2017 budget for WECC assessments to the AESO is $2.2 million compared to the 2016 budget of $2.1 million.

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

[7] Western Electricity Coordinating Council/Northwest Power Pool

their Reserve Sharing Group, thereby reducing Alberta's reserve requirements at times. The annual budget for NWPP fees is $0.1 million for 2017, which is consistent with 2016.

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 2017 budget for regulatory process costs is $1.5 million compared to the 2016 budget of $1.7 million.

General and Administrative Costs

As mentioned in the previous section (2017 Business Plan), Management has proposed a six-month budget to allow for continued operations at the current level of expenditures while the AESO awaits further direction from the provincial government on the implementation plan for the Climate Leadership Plan. AESO Management is anticipating that operations will continue as-is into the early part of 2017. The 2017 six-month budget is 50 per cent of the approved 2016 budget.

General and Administrative Costs ($ million)

	2017 6-Month Budget	2016 Budget	2015 Actual	2014 Actual
Staff	**33.0**	66.1	64.8	62.7
Contract Services and Consultants	**5.0**	9.8	6.5	12.2
Administration	**2.4**	4.9	4.1	5.0
Facilities	**3.9**	7.8	7.6	6.2
Computer Services and Maintenance	**4.7**	9.4	9.0	8.5
Telecommunications	**0.7**	1.4	1.4	1.4
General and Administrative Costs	**49.7**	99.4	93.4	96.1

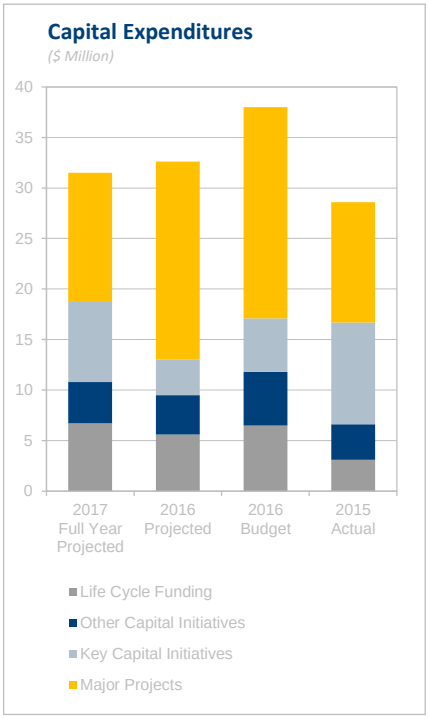
Differences are due to rounding

Interest Costs and Amortization

Interest Costs and Amortization ($ million)

	2017 6-Month Budget	2016 Budget	2015 Actual	2014 Actual
Interest	**0.2**	0.4	0.5	0.1
Amortization of Intangible and Capital Assets	**12.2**	24.4	26.0	26.9

Capital Expenditures



A detailed review of the capital requirements for 2017 takes into consideration the progress that has been made on the 2016 projects that are multi-year in nature, the new requirements for 2017 and the AESO's capacity to design and implement system solutions. Based on these findings, the six-month capital budget is $15.4 million.

The budget estimate is based on an allocation model applied to the total annual assessment of $31.5 million, which is approximately 50 per cent of the full-year projection. Further review for the remainder of the 2017 capital budget will occur during the budget process for the period from July 2017 to December 2018.

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 to re-evaluate capital plans throughout the year.

The following table identifies a preliminary list of projects that are planned for 2017 based on current operations and the business initiatives. As time progresses in 2017, requirements and circumstances may change and the portfolio management process will be used to manage these changes throughout the year.

Additional information on the 2017 capital projects is provided in Appendix E (2017 Capital Projects).

Capital Expenditures ($ million)

	2017 6-Month Budget	2017 Projected	2016 Projected[8]	2016 Budget	2015 Actual
Key Capital Initiatives					
1. Reliability (EMS[9] components)	0.3	0.5	0.2	-	6.0
Reliability (Other components)	0.0	0.4	0.8	0.7	0.4
2. Critical Infrastructure Protection	0.0	0.0	0.2	0.7	0.3
3. IT/Cyber Security	1.0	2.7	1.6	2.5	0.6
4. MSR[10] - Sustainment	1.4	3.0	-	-	-
5. Market Evolution	0.0	0.1	0.2	0.5	2.1
6. Intertie Framework	0.1	0.3	0.0	0.3	0.4
7. Transmission Cost Accountability	-	-	-	0.0	0.2
8. Technology Review (website refresh)	-	-	0.5	0.6	0.1
9. Facilities	0.4	1.0	-	-	-
Total Key Capital Initiatives	**3.2**	8.0	3.5	5.3	10.1
Other Capital Initiatives	**1.8**	4.1	3.9	5.3	3.5
Life Cycle Funding	**3.1**	6.7	5.6	6.5	3.1
Sub-total Capital	**8.1**	18.8	12.9	17.1	16.7
Major Project – EMS	**5.0**	5.9	16.4	17.1	7.3
Major Project – MSR[10]	-	-	2.4	2.5	4.6
Major Project – SCC[11]	**2.4**	6.8	0.8	1.3	-
Total Capital	**15.4**	31.5	32.5	38.0	28.6

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 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.

[8] August 31, 2016 spent plus estimate to complete for current year

[9] Energy Management System (EMS)

[10] Market Systems Replacement and Reengineering (MSR) Implementation Project

[11] System Coordination Centre (SCC) Expansion Project

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 2017 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 Alberta Utilities Commission (AUC). The ISO tariff is designed to allocate the costs to all users of the transmission system based on level of usage. The 2017 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 MWhs traded. With the proposal for a six-month own cost budget for the period from January to June 2017 that is 50 per cent of the 2016 budget, the current energy market trading charge of 31.5¢ per MWh traded will continue until June 2017.

These trading charge amounts are independent of the Market Surveillance Administrator (MSA) charge. The 2017 MSA cost recovery amount will be communicated to the AESO in the latter part of 2016. The MSA cost recovery amount is approved by the Chair of the AUC in an independent budget process.

Trading Charge (¢ per MWh)

	2017 Budget
AESO Costs	26.2¢
Energy Market Shortfall / (Surplus)	-
AESO Component	26.2
AUC's Portion of Energy Market Administration Fee	5.3
Total	**31.5¢**

Differences are due to rounding

Renewables

The AESO is responsible to develop, implement and administer renewable electricity programs and recover the costs through fees charged to participants in the competitive process and generators that receive renewable energy credits. The 2017 budget costs related to the renewables function will be incorporated into future charges.

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: 2014-2018 Strategic Plan

The AESO reviews its strategic plan on an annual basis and amends the plan accordingly. The *2014–2018 Strategic Plan* serves as the starting point for the development of this business plan, and the successive business plans and budgets that will follow.

AESO Mission

> *The AESO facilitates a fair, efficient and openly competitive market for electricity and provides for the safe, reliable, economic operation of the Alberta Interconnected Electric System.*

AESO Vision

> *The AESO is the trusted leader in the advancement of the electricity framework by ensuring reliability, facilitating competition, enabling Alberta's economic growth, and enhancing the quality of life for Albertans.*

Strategic Objectives

The AESO pursues three key objectives; build on the success of the current electricity framework that has been successful to date, provide value to Albertans as an organization, and retain and attract the right people. The objectives have been captured within three strategic objectives, and are summarized under the headings Framework, Value, and People.

The three strategic objectives are as follows:

Framework

> *We will enable Albertans to continue to realize the value provided by robust competition and reliable operations, while providing our stakeholders with confidence to invest in the province as we guide the evolution of the electricity framework.*

Value

> *We will drive value throughout all that we do in the execution of our mandate by maintaining focus, striving for exceptional delivery, and upholding high standards of excellence while being adaptable to change.*

People

> *We will continue to strengthen our workforce capacity and talent to enable the AESO to meet the changing needs of the organization.*

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 August 2016 Financial Results Detail

Costs

Year-to-Date August 2016 Transmission Operating Costs ($ million) ~ by production year

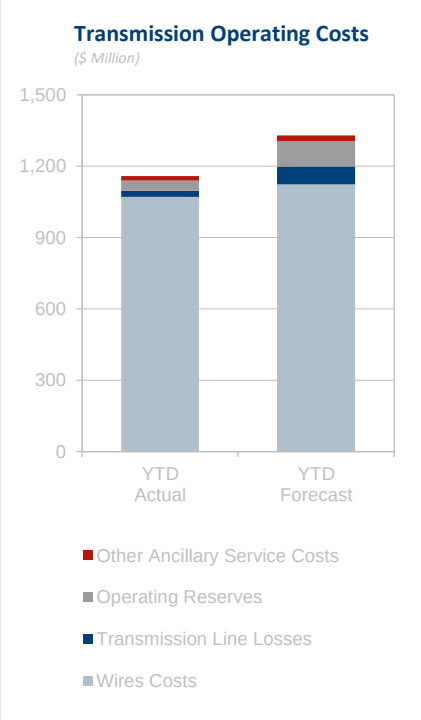
	YTD Aug Actual	YTD Aug Forecast	YTD Aug Variance	2016 Projected	2016 Forecast
Wires Costs	1,070.8	1,123.2	(52.4)	1,706.0	1,684.8
Transmission Line Losses	25.2	74.9	(49.7)	44.4	111.9
Operating Reserves	43.5	106.3	(62.8)	64.3	147.1
Other Ancillary Service Costs	18.7	23.6	(4.9)	28.9	35.5
Transmission Operating Costs	**1,158.2**	**1,328.1**	**(169.9)**	**1,843.5**	**1,979.3**

Differences are due to rounding

Transmission Operating Costs

The table above provides the transmission operating costs as of August 2016 compared to the forecast.

Transmission operating costs represent wires, transmission line losses and ancillary services costs. As of August 2016, actual costs of $1,158.2 million are $169.9 million or 13 per cent lower than the forecast costs of $1,328.1 million.



Wires Costs

Wires costs as of August 2016 are $1,070.8 million, which is $52.4 million or five per cent lower than the forecast of $1,123.2 million based on the amounts paid primarily to the TFOs in accordance with their AUC-approved tariffs.

It is projected that the 2016 wires costs will be $1,706.0 million, which is $21.2 million or one per cent higher than the 2016 forecast of $1,684.8 million. The 2016 forecast was based on TFO tariffs approved or applied-for in late 2015. The year-to-date and 2016 projected costs reflect applications and decisions that have been filed or approved since the 2016 forecast was prepared.

Transmission Line Losses

Transmission line losses costs at the end of August 2016 are $25.2 million, which is $49.7 million or 66 per cent lower than the forecast of $74.9 million. The cost of transmission line losses is impacted by the pool price and losses volumes. Transmission line losses costs are projected to be $44.4 million for 2016.

The year-to-date August 2016 actual average hourly pool price is $17 per MWh compared to the forecast of $43 per MWh.

Transmission line losses volumes to the end of August 2016 are 1.4 terawatt hours, which is 0.3 terawatt hours or 17 per cent lower than the August 2016 forecast volumes of 1.7 terawatt hours. The lower transmission line losses volumes are primarily due to lower demand.

Operating Reserves

Operating reserve costs at the end of August 2016 are $43.5 million, which is $62.8 million or 59 per cent lower than the year-to date August 2016 forecast of $106.3 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 $64.3 million for 2016.

Operating reserves volumes to the end of August 2016 are 4.9 terawatt hours, which is 0.6 terawatt hours or 10 per cent lower than the August 2016 forecast of 5.5 terawatt hours. In comparison, the August 2015 operating reserves volumes were 5.1 terawatt hours.

The cost variance as of August 2016 is mainly attributable to lower pool prices and changes to offer behavior.

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 August 2016 are $18.8 million, which is $4.9 million or 21 per cent lower than the August forecast of $23.6 million.

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

	YTD Aug Actual	YTD Aug Budget	YTD Aug Variance	2016 Projected	2016 Forecast
Load Shed Service for Imports	12.1	13.3	(1.2)	19.0	20.0
Contracted Transmission Must-run	-	-	-	-	-
Conscripted Transmission Must-run	1.4	2.7	(1.3)	2.0	4.0
Reliability Services	1.9	1.9	-	2.9	2.9
Poplar Hill	1.9	1.7	0.2	2.8	2.5
Black Start	1.4	1.4	(0.0)	2.1	2.1
Transmission Constraint Rebalancing	0.0	2.7	(2.7)	0.1	4.0
Other Ancillary Service Costs	**18.8**	**23.6**	**(4.9)**	**28.9**	**35.5**

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 August 31, 2016, LSSi costs are $12.1 million, which is $1.2 million or nine per cent lower than the forecast of $13.3 million due to reduced number of arming and tripping events related to lower import volumes.

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).

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

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. The costs of transmission constraint rebalancing will be recovered from loads through the ISO tariff, in accordance with AUC directions in Decision 2013-135. The rule and tariff changes to implement transmission constraint rebalancing came into effect on November 26, 2015.

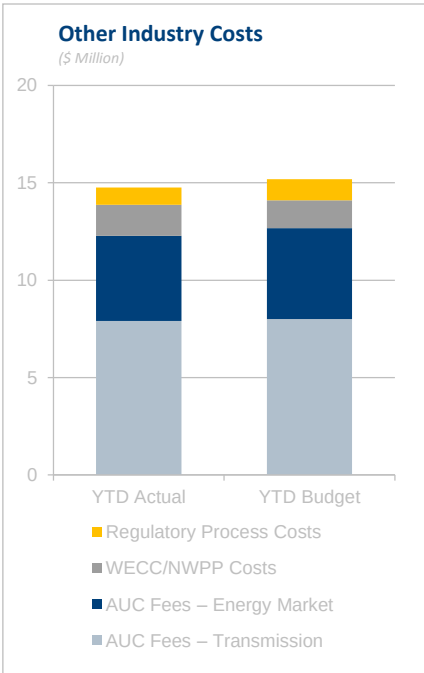
Other Industry Costs

The following table provides other industry costs as of August 2016 compared to the budget.

Year-to-Date August 2016 Other Industry Costs ($ million)

	YTD Aug Actual	YTD Aug Budget	YTD Aug Variance	2016 Projected	2016 Budget
AUC Fees – Transmission	7.9	8.0	(0.1)	12.1	12.0
AUC Fees – Energy Market	4.4	4.7	(0.3)	6.6	7.0
WECC/NWPP Costs	1.6	1.4	0.2	2.4	2.2
Regulatory Process Costs	0.9	1.1	(0.2)	1.3	1.7
Other Industry Costs	**14.8**	**15.2**	**(0.4)**	**22.4**	**22.8**

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) and Northwest Power Pool (NWPP) membership fees; and regulatory process costs.

Based on current estimates, it is anticipated that actual other industry costs in 2016 will be $22.4 million, which is $0.4 million or two per cent lower than the 2016 budget of $22.8 million.

AUC fees at the end of August 2016 are $12.3 million, which is $0.4 million or three per cent lower than the budget of $12.7 million. The 2016 budget was based on the 2015 AUC fees while the actual 2016 fees are lower.

The WECC/NWPP fees at the end of August 2016 are $1.6 million, which is $0.2 million or 11 per cent higher than the budget of $1.4 million.

The 2016 projected cost for regulatory processes is $1.3 million, which is $0.4 million or 24 per cent lower than the 2016 budget of $1.7 million. This projection is based on the regulatory proceedings that have occurred in 2016 and approximately $0.6 million of payments to retailers in the Fort McMurray fire affected area. This payment process was an agreed to arrangement between the distribution facility owner, the AUC, affected retailers and the AESO. The payments to retailers will be passed on to non-industrial customers to offset energy charged during the Fort McMurray-area evacuation period.

General and Administrative Costs

The following table provides the general and administrative costs as of August 2016 compared to the budget.

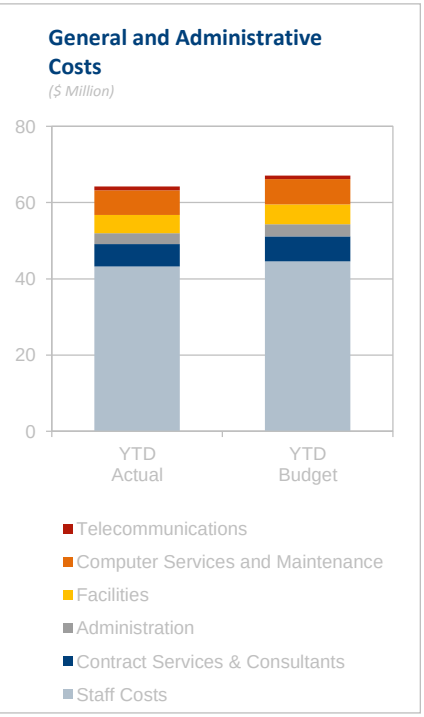
Year-to-Date August 2016 General and Administrative Costs ($ million)

	YTD Aug Actual	YTD Aug Budget	YTD Aug Variance	2016 Projected	2016 Budget
Staff Costs	43.2	44.5	(1.3)	65.0	66.1
Contract Services and Consultants	5.9	6.6	(0.7)	8.5	9.8
Administration	2.9	3.2	(0.3)	4.1	4.9
Facilities	4.8	5.2	(0.4)	7.3	7.8
Computer Services and Maintenance	6.5	6.6	(0.1)	9.2	9.4
Telecommunications	1.0	1.0	0.0	1.5	1.4
General and Administrative Costs	**64.2**	**67.1**	**(2.9)**	**95.6**	**99.4**

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. It is anticipated that staff costs will be $65.0 million, which is $1.1 million or two per cent lower than budget due to a higher actual vacancy rate compared to the 2016 budget; the budget vacancy rate is six per cent.



Contract Services and Consultants

The contract services and consultants costs are anticipated to be $8.5 million, which is $1.3 million or 14 per cent lower than the 2016 budget of $9.8 million mainly due to the postponement or deferral of planned initiatives.

Administration

Administration costs include corporate communications, recruiting, travel and training, AESO Board fees, and office costs that present the general operating costs of the organization. Based on current estimates, it is anticipated that actual costs in 2016 will be $4.1 million, which is $0.8 million or 16 per cent lower than the 2016 budget of $4.9 million.

Facilities

Facility costs include rent and operating costs for three AESO locations. The facility costs in 2016 will be $7.3 million, which is $0.5 million or seven per cent lower than the 2016 budget of $7.8 million due to lower operating costs.

Computer Services and Maintenance

Ongoing costs are incurred to purchase annual software operating licences and maintenance agreements for the AESO's information technology systems. Based on current estimates, it is anticipated that actual costs in 2016 will be $9.2 million, which is $0.2 million or two per cent lower than the 2016 budget of $9.4 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. Based on current estimates, it is anticipated that actual costs for telecommunications for 2016 will be consistent with the 2016 budget.

Interest and Amortization Costs

The following table provides the interest and amortization costs as of August 2016 compared to the budget.

Year-to-Date August 2016 Costs ($ million)

	YTD Aug Actual	YTD Aug Budget	YTD Aug Variance	2016 Projected	2016 Budget
Interest	1.1	0.3	0.8	1.6	0.4
Amortization of Intangible and Capital Assets	15.3	16.2	(1.0)	23.0	24.4

Differences are due to rounding

Interest

Actual interest costs are higher than budget for 2016 due to higher borrowing requirements. The higher borrowing requirements are attributable to collections less than costs resulting in a cash shortfall. Borrowing requirements for working capital, deferral account balances and intangible and capital asset purchases are offset by generating unit owner's contribution deposits.

Amortization

A number of variables are taken into consideration in developing the annual amortization budget. These variables include the asset addition types (impacting the estimated useful life), the purchase amount, and the timing (commissioning date) of asset additions. Based on current estimates, it is anticipated that the actual amortization for 2016 will be $23.0 million compared to the budget of $24.4 million.

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 unanticipated 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 estimated capital expenditures in 2016 are $32.5 million which is $5.5 million or 14 per cent lower than the 2016 budget of $38.0 million.

Additional information on capital projects is provided in Appendix E (2017 Capital Projects).

Capital Expenditures ($ million)

	2016 YTD Aug Actual	2016 Remaining	**2016 Projected**
Key Capital Initiatives	2.2	1.3	**3.5**
Other Capital Initiatives	1.3	2.6	**3.9**
Life Cycle Funding	3.7	1.9	**5.6**
Major Project – Energy Management System	10.5	5.9	**16.4**
Major Project – Market Systems Replacement and Reengineering	1.6	0.8	**2.4**
Major Project – System Coordination Centre Expansion	0.5	0.3	**0.8**
Total Capital Spending	19.7	12.8	**32.5**

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 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

2017 Pool Price Forecast Methodology

The AESO has chosen to use the EDC Associates' hourly pool price forecast for 2017 (published in August 2016 as the "Q3 2016 Forecast Update Report"). While the AESO has prepared an internal hourly pool price forecast for the past four years, competing priorities for the staff resources contributed to the decision to make the change for the 2017 BRP.

The average hourly pool price forecast is used as an input to calculate the transmission line losses and ancillary services costs forecasts.

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:

- expectation that more generating assets will be offered at close to marginal costs;
- no impact for accelerated coal unit retirements in 2017; and
- pricing impacts associated with the new carbon levy in Alberta will start in January 2017.

The 2017 average pool price is forecast to be $32 per MWh compared to the 2016 projected average pool price of $21, an increase of 53 per cent. The higher pool prices anticipated for 2017 are due to:

- higher demand; and
- higher natural gas prices.

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:

- five-year historical actual losses volumes as a percentage of demand; and
- forecast load volumes.

The annual forecast for transmission line losses costs is the accumulation 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.

The AESO procures the different types of operating reserves in two forms: active and standby.

Categories of Operating Reserves

1) **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
   - represents over 75 per cent of total operating reserves costs
   - costs are impacted by pool price fluctuations, supply of offered reserves and market participant offer behavior

2) **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
   - represents less than 25 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).

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.

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

The Poplar Hill generator provides voltage support (VArs) in addition to power (MW), to support the transmission system reliability in the province.

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

Transmission constraint rebalancing costs are incurred when the transmission system is unable to deliver electricity from a generator to a given electricity consuming area without contravening reliability requirements. When this occurs, a market participant downstream of a constraint may be dispatched for purposes of transmission constraint rebalancing under the ISO Rules and would receive a transmission constraint rebalancing payment for energy provided for that purpose. Transmission constraint rebalancing came into effect on November 26, 2015.

Appendix D: Six-Month 2017 General and Administrative Cost Detail

Human Resources

Human Resources ($ million)

	2017 6-Month Budget	2016 Projected	2016 Budget	2015 Actual	2014 Actual
Staff	**33.0**	65.0	66.1	64.8	62.7
Consulting	**4.1**	6.5	8.1	6.0	9.9
Legal	**0.8**	1.8	1.6	0.3	2.3
Audit/Reviews	**0.1**	0.1	0.2	0.1	0.1
Human Resources	**38.0**	73.5	75.9	71.3	74.9

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 the base salary rates. Near the end of the year, management will recommend a base salary adjustment to the AESO Board's Human Resources Committee (HRC) for final approval. Prior to a decision by the HRC, no adjustment has been reflected in the 2017 budget (there was no base pay adjustment in 2016).
- **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, the AESO has confidence in its approach to successfully deliver on its goals and has reflected this in its incentive compensation at 60 per cent of eligibility, which is consistent with 2016.
- **Vacancy rate** – The AESO has included a six per cent vacancy rate for 2017 which is consistent with the 2016 budget and the anticipated 2016 actual vacancy rate.
- **Benefit costs** – In addition to their salary, each employee participates in the organization's comprehensive benefit plan. For the organization, this represents costs such as health and dental coverage, defined contributions for retirement savings and government payroll costs. These costs are presented as a percentage of salary costs to determine the "benefits load factor" which has been budget at 22 per cent of salary costs in 2017 which is consistent with the 2016 budget.

Consulting – The AESO uses consultants to supplement staff resources for two general purposes. It is not practical to retain staff that have all of the skill sets that may be required from time to time. 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.

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 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.

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

Administration

Administration ($ million)

	2017 6-Month Budget	2016 Projected	2016 Budget	2015 Actual	2014 Actual
AESO Board Fees	**0.3**	0.5	0.5	0.5	0.5
Travel and Training	**1.0**	1.7	1.9	1.7	2.1
Insurance	**0.3**	0.5	0.7	0.6	0.6
Other Administrative	**0.9**	1.4	1.8	1.3	1.8
Administration	**2.4**	4.1	4.9	4.1	5.0

Differences are due to rounding

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.

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 and open houses for proposed transmission projects.

Insurance – The 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.

Other Administrative Costs – This category includes corporate relations, general office costs, printing, recruiting, corporate subscriptions/memberships and professional membership fees. Starting in 2015, a more cost effective approach for hosting open houses on proposed transmission projects was initiated.

Facilities

Facilities ($ million)

	2017 6-Month Budget	2016 Projected	2016 Budget	2015 Actual	2014 Actual
Rent	**3.9**	7.3	7.8	7.6	6.2

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 System Coordination Centre which is owned and operated by the AESO, and iii) additional space for the AESO's Backup Coordination Centre to accommodate redundant computer systems to support seamless operating performance in the event of a disruption to the operations at the System Coordination Centre.

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.

In 2015, higher base rent and operating costs related to the AESO's downtown office space began. No additional office space has been planned for 2017.

Computer Services and Maintenance

Computer Services and Maintenance ($ million)

	2017 6-Month Budget	2016 Projected	2016 Budget	2015 Actual	2014 Actual
IT Maintenance and Services	**4.7**	9.2	9.4	9.0	8.5

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[12] for IT infrastructure operating support (e.g., network, server and database).

The software and hardware operating licences and maintenance agreements for the systems are a combination of a core base infrastructure system and applications that change as new projects are approved. The higher Canadian to US dollar exchange rate starting in 2015 impacts the total costs as several of the major licence and maintenance agreements are denominated in US dollars.

[12] 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 would be 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.

Telecommunications

Telecommunications ($ million)

	2017 6-Month Budget	2016 Projected	2016 Budget	2015 Actual	2014 Actual
Telecommunications	**0.7**	1.5	1.4	1.4	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.

Appendix E: 2017 Capital Projects

The following tables provide information on the AESO's current capital plan for 2017. Actual projects to be completed in 2017 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		
Reliability Program – Energy Management System (EMS)	**Description**	The EMS is used by System Controllers in grid operations to monitor, control and optimize the performance of the power system. The EMS is comprised of two major components the Application suite and Infrastructure. Both components have reached end of life and will no longer be supported by their respective vendors. In order to ensure reliable grid operations, be critical infrastructure protection (CIP) compliant and have supported hardware and software, it was deemed prudent to proceed with an upgrade to the AESO EMS.
	2016 Progress	Key achievements include infrastructure (equipment) purchase and configuration as well as completion of the Pre-Factory Acceptance Testing and Factory Acceptance Testing phases. Site Acceptance Testing phase activities have also been initiated.
	2017 Plan	The implementation phase of the EMS upgrade program is a multi-year project expected to conclude in Q3 2017. See Appendix F (Major Projects) for additional details on the EMS Phase III Implementation project.
Reliability Program - Other Components (non-EMS)	**Description**	Grid management projects that are intended to enhance the efficiency and improve the ability to reliably run the Alberta Interconnected Electric System (AIES).
	2016 Progress	The primary focus for 2016 has been the replacement of the Supervisory Control and Data Acquisition (SCADA)/Wide Area Network (WAN) communications service. The SCADA/WAN communications service is the conduit for obtaining real-time AIES grid data used by AESO operations. The SCADA/WAN replacement project is intended to replace the existing TELUS Asynchronous Transfer Mode (ATM) managed service (to be discontinued) with a new service offering, Multiprotocol Label Switching (MPLS).

Key Capital Initiatives		
Reliability Program - **Other Components (non-EMS)** **(continued)**	**2017 Plan**	Initiate a phased migration of Transmission Facility Owners (TFOs) to the new network. MPLS network with TFOs established to increase reliability
Alberta Reliability Standards Critical Infrastructure Protection (CIP) Implementation	**Description**	Implementation of facility upgrades, changes to AESO sites and/or systems that are required to support CIP V5 implementation and compliance requirements.
	2016 Progress	A number of facility access and security control changes were completed. In addition, a number of system changes were required to ensure Bulk Electric System (BES) compliance with CIP Standards.
	2017 Plan	Implement remaining facility access, security controls and system changes required to ensure compliance readiness.
IT / Cyber Security Advancements	**Description**	Upgrade AESO systems and processes to reduce the risk of cyber security breaches and facilitate AESO compliance to CIP V5 requirements.
	2016 Progress	Implemented Network Advanced Threat Management Phase 1. The Firewall Reinforcement project is in progress and scheduled to complete by year end. Implementation of Continuous Vulnerability Management is currently in progress scheduled to complete by year end. Advanced Threat Management Phase 2 is expected to complete early in 2017. The multi-year Identity and Access Management (IAM) projects have begun.
	2017 Plan	Continue the advancement of AESO's IT security posture progression of the IAM projects as well as Data Loss Prevention (DLP). Improve security and resiliency of mobile devices.

Key Capital Initiatives		
Market Systems Replacement and Reengineering (MSR) - Implementation (Sustainment)	**Description**	The MSR Implementation program is based on a multi-year phased approach designed to address the operating requirements of the AESO's market systems. Many of these systems have been stretched past their useful life and in many cases, have become increasingly difficult and costly to change and operate reliably. Due to the significant magnitude of the program and its impact on stakeholders, the AESO's strategy has been to incrementally and iteratively address the highest systems priorities with minimum change. With the current external environment there is less certainty of what the future market scenarios may be. Given this, the AESO considers it prudent to defer the implementation of longer-term solutions and focus on short-term sustainment requirements.
	2016 Progress	Completed MSR short-term reliability and security measures previously identified.
	2017 Plan	Continue the advancement of short-term measures to sustain the reliability of current market systems. Initiate the groundwork for the inclusion of longer-term solutions that address CLP as well as other market requirements.
Market Evolution	**Description**	The identification, development and implementation of tools in support of market optimization and/or performance improvements. This includes the ongoing review (assessment and consultation) of the market design and its structural elements in consideration with the Market Systems Replacement and Reengineering (MSR) Project.
	2016 Progress	Requirements for the integration of new technologies (including storage) continue to be defined. Related capital upgrades have been deferred to 2017. Enhancements to the Alberta Load Forecast (ALF) system have been approved and the project is expected to begin by year end.
	2017 Plan	Anticipate minor system development activities will be required to address the ongoing integration of new technologies. Complete the ALF enhancement project.

Key Capital Initiatives		
Intertie Framework	**Description**	Develop and implement a framework and set of tools supporting increased transfer capacity with neighbouring jurisdictions. This includes, but is not limited to, restoring existing intertie capacity, support for merchant transmission additions and implementation of dynamic scheduling solutions.
	2016 Progress	Regulating Reserves over the Interties project was cancelled due to the uncertainty around the availability of the Dynamic Scheduling System (DSS) software and its usage by other WECC members. Available Transfer Capacity (ATC) Posting and ATC Rule review system changes were also cancelled. Intertie restoration plans developed. Implementation activities have been initiated.
	2017 Plan	Minor system development activities are anticipated.
Technology Review (Website tools and Content)	**Description**	Replacement of discontinued web hosting technology in support of hosting www.aeso.ca
	2016 Progress	Project successfully completed.
	2017 Plans	No other project activities planned.
Facilities	**Description**	Implement physical access control (security) improvements at the System Coordination Centre (SCC) to accommodate activity level increases.
	2016 Progress	Completed requirements definition activities including business case development for management consideration
	2017 Plans	Complete work at the SCC to improve physical access control capability.
Key Initiatives		**$8.0 million**

Other Capital Initiatives ($ 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	2017 Projected Budget
Business Technology Solutions	Implementation of technology solutions to improve operating effectiveness/efficiency and controls. Upgrades to the corporate financial systems supporting the General Tariff Application and deferral reporting (roll-forward) requirements.	1.3
Reliability - EMS	EMS related upgrades that have been pending major project (EMS - Implementation) completion, includes vendor software upgrades as well as improved remote reporting capabilities.	1.2
Reliability - Other	Upgrades to existing System Coordination Centre, Back Up Coordination Centre and Control Room systems and technologies.	0.4
System Enhancement Program	Ongoing high priority minor enhancements to production applications.	1.0
Leasehold Improvements	Office furniture purchase, replacement and other leasehold improvements.	0.1
Miscellaneous	Other minor system projects not exceeding $0.1 million.	0.2
Other Capital Initiatives		**4.1**

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	2017 Projected Budget
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.	0.8
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.	0.5
Storage Upgrade	Implement selected storage infrastructure upgrades to address existing end-of-life cycle considerations, support the high-performance storage requirements of on-line stakeholder systems and increase the reliability/availability of critical data systems between the AESO's data centres.	2.0
Enterprise Services	Upgrades to the AESO inter-application messaging platform to ensure consistent and accurate data is exchanged.	0.3
Monitoring Solutions	Upgrade and integration of disparate monitoring solutions for a more holistic view of infrastructure and application performance.	0.3
Communications	Upgrade, optimization and consolidation of voice (telephone) systems to ensure continued reliability.	0.5
Applications Lifecycle	Upgrades to the underlying technologies that support the AESO's corporate and enterprise applications.	1.5
End User Computing	Upgrade activities that keep the end user computing platform current.	0.4
Database Upgrade	Upgrade to the database environment that supports the AESO's critical applications.	0.2
Non-project Capital	Ongoing investment in desk side systems, productivity tools, services and mobile devices to replace aging software and equipment and accommodate resource growth (e.g., data storage).	0.4
Life Cycle Initiatives		**6.7**

Differences are due to rounding

Appendix F: Major Projects

Energy Management System (EMS) Implementation

EMS Implementation Project Overview	
Description	The Energy Management System (EMS) is a critical control system used by the AESO to manage and operate the Alberta Interconnected Electric System (AIES). The existing EMS 2.5 system was implemented in 2009 and is approaching a state where it will no longer be supported by the vendor. The current hardware and software is referred to as system end-of-life and vendor support shall cease shortly. It has become increasingly complex to maintain and increasingly costly to ensure its reliable and secure operation. In addition, the current EMS system will not meet the compliance requirements when the Critical Infrastructure Protection (CIP) regulations take effect in 2017. Although the AESO has taken steps to ensure the current system continues to meet reliability standards, it cannot fully mitigate the natural consequences of an aging system and the limitations of a non-supported EMS platform. More costly and frequent break-fixes are occurring and the risk of critical outages continues to grow. In response, the AESO started the EMS 3.0 Program to begin planning the upgrade to the current system. Due to the complexity and criticality of the initiative the Program initiated a 12 month Definition Phase in September 2014 to complete all the detailed requirements: costing, planning and design activities required before embarking on the Implementation Phase. The objective of the Implementation Phase is to complete the installation of both the Alstom EMS 3.0 application and new infrastructure. EMS 3.0 will be built new-on-new, meaning a new version of the application software configured on a new server, networking and security infrastructure. This allows the new system to be brought online in parallel with the current system and undergo thorough testing before cut over. EMS 3.0 will provide like-for-like functionality with the current system but with a number of the existing customizations now included as core functions. The second objective is to implement a fully integrated EMS lifecycle management plan to manage the new system and ensure the reliable and efficient operation of the AESO EMS 3.0. All CIP compliance requirements will also be met.

EMS Implementation Project Overview	
Scope of the EMS 3.0 Program	The EMS 3.0 Program scope includes the implementation of all core application functionality (Core Services, Network Applications, SCADA, Generation, Dispatch Training Simulator (DTS), system modeling, and User Interface updates) and integration with AESO external systems. It also includes installing all new infrastructure such as servers, storage, security and networking equipment. Following the cutover of the new system, the program will complete the decommissioning of the current EMS 2.5. To optimize the operational sustainment of the EMS system the Program will also implement an EMS lifecycle management plan to manage the operational processes as well as the scheduling and costs of system maintenance, upgrades and enhancements (both application and infrastructure) throughout its lifecycle until 2021.
Program Approach	A multi-year phased approach has been proposed to incrementally address the EMS 3.0 Program. <u>Phase I – Validation (completed)</u> During the Validation Phase evaluation of the environment as well as a technical assessment of the EMS 2.5 system was completed, the remainder of the EMS 3.0 program was then broken down into a Definition and Implementation Phase. <u>Phase II – Definition Phase (completed)</u> The objective of the Definition Phase was to complete the detailed requirements, design, cost and schedule estimates and planning documents necessary to ensure successful delivery. A System Integrator with expertise in the planning and delivery of large-scale projects in the Energy Management sector was engaged to support the internal resources and to ensure all necessary deliverables were completed. The resulting Definition Phase recommendation to proceed with the EMS implementation was approved by the AESO Board September 2015. <u>Phase III – Implementation (forecasted completion Q3 2017)</u> The implementation project has been structured into two parallel streams, Application and Infrastructure. The streams have been broken into eight phases: Development and integration; Pre-Factory Acceptance Testing; Factory Acceptance Testing (FAT); Site Acceptance Testing (SAT); User Acceptance Testing (UAT); Deployment; Warranty; and Decommissioning. The implementation has a target go-live date of June 2017. The budgeted cost estimate is $31.7 million (excludes capitalized borrowing costs). The testing phases will last for a total of 10 months. Testing begins with Pre-FAT and FAT. During these phases, the vendor Alstom and AESO test the individual components. Once FAT is complete, the teams test the system end-to-end during SAT and UAT. For each testing phase specific acceptance

EMS Implementation Project Overview	
	criteria must be met. At the end of testing, EMS 3.0 will be deployed to Production in a phased cutover and will run in parallel to EMS 2.5 for 1,000 hours. On successful completion of this availability test, the cutover to EMS 3.0 will be completed and EMS 2.5 decommissioning can start. The Implementation Phase also includes extensive training, life-cycle management planning and documentation, process definition and knowledge transfer to transition to the System Controllers and operational teams for real-time support, and ongoing operational sustainment.

System Coordination Centre (SCC) Expansion

System Coordination Centre Expansion	
Description	In 2006, the AESO built a new System Coordination Centre (SCC) to coordinate the Alberta Interconnected Electric System (AIES). Due to the increase in the number of programs and initiatives provided by AESO Operations, the number of employees required at the SCC has grown to exceed the current capacity. Temporary actions have been taken to accommodate this growth however there are a number of risks associated with this situation and AESO personnel continue to work in less than ideal conditions. The overall plan to move forward is to: correct the existing issues as well as consider future Operational requirements; address the inherent loss of efficiency in support of grid operations when the personnel are not physically located at the SCC; and take into account Alberta Reliability Standards (ARS) Critical Infrastructure Protection (CIP) Standards.
Scope of the SCC Expansion	Expansion of the SCC facility that includes personnel workspace, meeting room space, data centre, dispatch training and storage.
Project Approach	A multi-year phased approach has been proposed to incrementally address the SCC expansion requirements. A phased implementation approach will: • Reduce project uncertainty with respect to requirements, costs and timing estimates through the progressive elaboration of details • Improve management's confidence in the requirements and estimates provided • Provide for a more systematic (gated) management and approval process <u>Phase I – Validation (completed)</u> The Validation Phase was completed in 2015 and provided a preliminary high level overview of the project including the identification of the business requirements; project scope; options to be considered; and initial cost and timing estimates. In December 2015, the AESO Board approved the recommendation to proceed to the next phase. <u>Phase II – Definition Phase</u> The Definition Phase has been substantially complete in 2016 with the delivery of detailed business requirements; detailed design; resource requirements and timeline; and more detailed cost estimates to proceed to the Implementation Phase. This information has been incorporated into a business case for the project. The cost estimate is currently $22.2 million with a construction completion date in Q4 2019. The business case will be presented to the AESO Board for

System Coordination Centre Expansion	
	review and approval in December 2016. <u>Phase III – Implementation (tentatively 2017/2019)</u> If approved, the Implementation Phase will include the tendering of the construction to a general contractor/construction firm; commencement of construction; AESO IT infrastructure (furniture, cabling, meeting room spaces, security); commissioning of the site and deficiencies correction activities.

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[13]	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

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

Section 5

Stakeholder Comments and AESO Responses

The Budget Review Process (BRP) provides stakeholders with the opportunity to review our business plan, budget and forecast materials and the opportunity to provide comments on this information.

This year, the AESO temporarily amended the BRP and chose to replace in-person stakeholder consultation meetings (technical consultation) with enhanced written documentation provided to stakeholders, followed up with written stakeholder questions and published AESO responses.

The following table identifies the key BRP dates in 2016.

Key BRP Dates in 2016	Purpose
July 21	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.
September 13	Notice to stakeholders – A notice was distributed to stakeholders communicating that there would be a change to the AESO's 2017 BRP to allow more details on the government's policy initiatives to become available which would better allow the AESO to develop the 2017 business plan and related budgets.
September 28	Notice to stakeholders – A notice was distributed to stakeholders communicating that the AESO is temporarily amending the annual BRP cycle and that the AESO would proceed with consultation on the budget through the submission of written comments. Also, that the AESO intended to roll forward it's 2016 business initiatives and budgets in order to prepare an interim six-month budget for 2017 followed shortly by a more detailed 18-month budget.
October 13	Notice to stakeholders – A notice was distributed to stakeholders providing them with details on the: • 12-month transmission operating costs forecast, • 6-month business initiatives; • 6-month own cost budget; and • comments matrix for feedback.
November 1	Stakeholder comments and AESO responses – Stakeholder comments and AESO responses on the summary presentation and supplementary forecast and budget reference document were distributed to stakeholders.

The following stakeholders provided comments to the AESO:

- Alberta Direct Connect Consumers Association (ADC)
- AltaLink Management Limited (AltaLink)
- Capital Power Corporation (Capital Power)
- Industrial Power Consumer Association of Alberta (IPCAA)
- Utilities Consumer Advocate (UCA)

Stakeholder Comment and AESO Replies Matrix
AESO Consultation – 2017 Budget Review Process

Business Initiatives, Operating Costs and Own Costs Budget Presentation

October 13, 2016

The following information is intended to summarize the AESO's responses to stakeholder comments on the AESO's 2017 Business Initiatives, Operating Cost Forecasts and Own Costs Budget estimates. The related information was presented/posted on the AESO website on October 13, 2016.

Preliminary List of 2017 Business Initiatives
Do stakeholders have any comments on the AESO's list of Business Initiatives proposed for 2017 (rolled forward from 2016)?

Alberta Direct Connect Consumers Association (ADC)

1. The ADC supports the business initiatives as described in the presentation. ADC has proposed the move to a 15 minute pool settlement interval in the past and continues to recommend the AESO consider this as part of any market system upgrades. A shorter settlement interval would improve market efficiency as more intermittent renewable resources are added.

Comment 1. Noted. The AESO continues to focus its Market Systems Replacement and Reengineering (MSR) program on implementing short-term reliability and security measures. The timing for the implementation of longer-term solutions such as dispatch and settlement period alignment will be reevaluated as part of the ongoing MSR program.

AltaLink Management Limited (AltaLink)

1. AltaLink supports the AESO's list of business initiatives which have been rolled forward from 2016 with the understanding that the priority of these initiatives may change once the government provides their new policy.

Comment 1. Noted

Capital Power Corporation (Capital Power)

Capital Power supports the AESO's decision to proceed with development of an abbreviated 6-month budget covering the period of January to June 2017 through a limited written process to allow time for more details on the Government's climate-related policy to be released. Capital Power understands that no new business initiatives are being proposed and recommends that the AESO focus its efforts and resources on implementing the Climate Change Program, furthering market initiatives- including mothballing, intertie restoration and the integration of energy storage, and continuing work and consultation on the 2017 GTA toward a Q1 2017 filing date. In the absence of policy certainty from the Government, the AESO should seek to provide market participants with as much certainty as possible on initiatives where the policy is clear. In this regard, Capital Power provides the following comments and requests regarding the Business Initiatives

Preliminary List of 2017 Business Initiatives
Do stakeholders have any comments on the AESO's list of Business Initiatives proposed for 2017 (rolled forward from 2016)?

identified in the October 13, 2016 Presentation.

Climate Change Program

1. In addition to the design and development of the AESO's Renewable Electricity Program ("REP"), the AESO should plan to undertake a review of the Connection Process and existing market rules to ensure alignment with the anticipated outcomes of the Alberta Climate Leadership Plan. Capital Power encourages the AESO to consult with and engage stakeholders to the greatest extent possible in these matters.

Comment 1. Noted. The review of rules and standards has been identified as a priority and included in the AESO's list of 2017 Business Initiatives as provided in the 2017 BRP Stakeholder Consultation Summary Presentation [slide 8]. Stakeholder engagement is considered a fundamental AESO principle and will occur as the REP program progresses.

Market Initiatives

2. Capital Power is interested in what new products and/or new technologies the AESO is considering in the scope of operating reserve amendments, and changes to technical standards and tariff provisions. Please provide an overview of the scope of these initiatives.

Comment 2. The AESO will provide this information as part of its future stakeholder engagement processes, however the AESO would like to note that the technical standards rule amendments in regards to operating reserves has already begun and can be reviewed at www.aeso.ca see Rules, Standards and Tariff.

3. Capital Power is interested in the AESO's work plan regarding intertie restoration during the period of January to June 2017. Please provide an update.

Comment 3. The AESO will provide stakeholders with information updates regarding the intertie restoration program and notes it has nothing new to report at this time.

4. Additionally, Capital Power requests that AESO assess and communicate market implications resulting from any changes to its current rules, policies, processes and procedures and consult with stakeholders to the greatest extent possible.

Comment 4. Noted. The AESO will communicate related updates through its regular stakeholder engagement process.

Preliminary List of 2017 Business Initiatives
Do stakeholders have any comments on the AESO's list of Business Initiatives proposed for 2017 (rolled forward from 2016)?

2017 GTA

5. Capital Power submitted comments to the AESO on September 28, 2016 regarding the scope of its 2017 GTA consultation. In those comments a number of questions concerning scope and process were asked to the AESO. Please advise when the AESO will be providing reply comments to stakeholders, or in the alternative when the next 2017 GTA consultation meeting will be held to address these issues.

Comment 5. Noted. The AESO will be holding additional stakeholder engagement sessions in regards to the 2017 GTA late in 2016 and early 2017. Please raise any further issues or concerns at these sessions.

6. In addition to these previously submitted written comments regarding the scope of the 2017 GTA consultation, Capital Power requests that the AESO also consider (i) a review of Section 11 Ancillary Services, subsection 6(1) & 6(2) to clarify the language regarding UTMR compensation and escalation path(s) and (ii) a review of Section 14 Peak Metered Demand Waivers to include language that gives consideration to generators.

Comment 6. See response to Comment 5 above.

Industrial Power Consumer Association of Alberta (IPCAA)

1. No major concerns.

Comment 1. Noted

Utilities Consumer Advocate (UCA)

1. The UCA does not have any comments on the AESO's list of Business Initiatives proposed for 2017.

Comment 1. Noted

Pool Price Forecast for 2017
Do stakeholders have any comments on the Pool Price forecast for 2017?

ADC

1. Can the AESO provide a comment on any cost savings or additional costs of using a 3rd party forecast?

Comment 1. There was no additional cost to the AESO for using a third party forecast. The AESO regularly subscribes to EDC's quarterly updates for various business purposes. In terms of cost savings, the resources typically allocated to developing the BRP pool price forecast were dedicated/reallocated to other Climate Leadership Program (CLP) related forecasting tasks within the AESO.

AltaLink

1. AltaLink supports using EDC Associates for its 2017 BRP pool price forecast.

Comment 1. Noted

Capital Power

1. Capital Power supports the use of accepted, reliable industry sources of information.

Comment 1. Noted

IPCAA

1. $32/MWh is proximate to the current (October 24th) forward curve – at $31.50/MWh for Cal 17.

Comment 1. Noted.

UCA

1. The UCA does not have any comments on the Pool Price forecast for 2017.

Comment 1. Noted

AESO Wires Costs Forecast for 2017

Do stakeholders have any comments on the Wires Costs forecast for 2017?

ADC

1. No comments

Comment 1. Noted

AltaLink

1. No comments.

Comment 1. Noted

Capital Power

1. Capital Power has no comment at this time.

Comment 1. Noted

IPCAA

1. Does this forecast incorporate values from the ATCO Electric 2015-17 GTA Compliance filing, and the AltaLink 2015-16 GTA Compliance filing?

Comment 1. The wires costs forecast shown in the 2017 BRP Stakeholder Consultation Summary Presentation (prepared as of September 26) did not include the impact of ATCO Electric's 2015-2017 GTA Compliance filing. The forecast did, however, include the impact of AltaLink's 2015-2016 GTA Compliance filing.

The AESO recently filed the 2017 tariff update application (October 21, 2016) which includes the most recent wires costs forecast, incorporating both TFO's compliance filings along with amounts assigned to prior production years. The table below contains the wires costs forecast included in the AESO's 2017 tariff update application and the 2017 BRP forecast for wires costs. The AESO will update the final BRP wires costs forecast to include the most current information.

$ million	2017 Forecast (Tariff Update)	2017 Forecast (BRP)	2016 Updated Forecast	2016 Forecast Costs	2015 Recorded Costs	2014 Recorded Costs
Wires Costs	**1,729.4**	**1,864.8**	**1,706.4**	**1,684.5**	**1,566.6**	**1,255.9**

AESO Wires Costs Forecast for 2017
Do stakeholders have any comments on the Wires Costs forecast for 2017?

UCA

1. The UCA represents the interests of residential, farm and small business consumers of electricity and natural gas in Alberta. Over the past several months, the UCA has noticed an increase in concerns from consumers regarding high transmission charges on their electricity bills. Therefore, the UCA would like to request more detail on the wires costs which are forecasted to increase from $1,591 in 2015 to $1,797.4 in 2016 and $1,859 in 2017.

Comment 1. **As indicated by the AESO, wires costs are the amounts paid primarily to TFOs in accordance with their Alberta Utilities Commission (AUC)-approved tariffs [99.7% of the 2017 forecast wires costs] and are not controllable costs of the AESO nor are these approved by the AESO Board. To prepare the 2017 forecast, the AESO used the TFO tariffs approved or applied-for with the AUC as of September 26, with a majority of the forecast reflecting: i) a compliance filing for a 2016 tariff; ii) a compliance filing for a 2017 tariff; or iii) AUC approvals for a 2017 tariffs. The AESO does not have a role in reviewing nor approving TFO tariff applications.**

2. Given the AESO is responsible to determine the need for developing new transmission infrastructure, either directed by the AESO or when requested by the TFO or DFO, can the AESO explain how it ensures the transmission wires solution is prudent and in the public interest compared to other options for addressing reliability concerns?

Comment 2. When the AESO develops its Need Identification Document (NID), a number of alternatives are determined by completing detailed planning studies. These alternatives are then screened by completing a technical, cost and land aspect assessment by the AESO. Several viable alternatives are then further assessed in conjunction with information received from the Transmission Facility Owner (TFO). Based on the assessment and study, the AESO selects a preferred alternative that is identified in our NID application to the AUC. The AESO will direct the TFO to complete its Facility Application for the transmission development, which includes a Service Proposal and Cost Estimate. The AESO reviews these documents to ensure they are accurate, complete and contain an appropriate level of detail before issuing a Notice to File Direction letter to the TFO.

When the costs change as a result of cost trends, in service date (ISD) changes or scope changes, the AESO reviews the revised estimates from the TFOs, ensuring that the planning decision is still appropriate. The AESO also ensures the costs are reasonable and well understood. At no time in the planning process does the AESO determine prudency of costs, as this is the role of the AUC.

AESO Wires Costs Forecast for 2017
Do stakeholders have any comments on the Wires Costs forecast for 2017?

3. Given the AESO is responsible for establishing practices respecting the preparation of cost estimates from TFOs, is the AESO planning to undertake any initiatives to improve these practices for the purposes of ensuring the cost estimates are reasonable compared to other options and that there is sufficient detail provided for cost oversight and monitoring?

Comment 3. The AESO has a number of initiatives to enhance the quality of estimates in the selection of planning alternatives and in making transmission planning decisions:

- **The AESO has further integrated the use of Geographical Information Systems (GIS) and Cost Benchmark data to evaluate alternatives in earlier stages of transmission planning. This has provided further analysis of preliminary cost estimates and has provided for land aspect information to be part of the alternative screening and assessment process. These efforts have been done in-house and further leverage technological efficiencies.**

- **The AESO provided the industry with a revised cost template on October 14, 2016. The revised cost template will consolidate the reporting of project cost information into one cost workbook. This consolidation includes the cost estimate for the initial service proposal, cost estimates due to project changes throughout the project lifecycle, and other cost estimates for 180 days after permit and licenses and the 90 day post energization final cost estimate. This template also includes the reporting of actual final costs, and will improve consistency and transparency throughout the project life cycle when used for cost management, oversight and monitoring.**

- **The AESO is continuously reviewing its cost review processes to ensure the best available information is received from the TFOs and that cost estimates align to the project Functional Specifications. The AESO is reviewing the Service Proposal guidelines which will be updated and posted by Q1 2017.**

- **The AESO continues to review and enhance ISO Rule 9.1 with respect to procurement and cost reporting.**

AESO Ancillary Services Costs Forecast for 2017
Do stakeholders have any comments on the Ancillary Services Costs forecast for 2017?

ADC

1. No comments

Comment 1. Noted

AltaLink

1. No comments.

Comment 1. Noted

Capital Power

1. Has the AESO factored any changes in determining UTMR or other Ancillary Services into the budget?

Comment 1. The methodology used to determine the 2017 forecast was provided in the Supplementary 2017 Forecast and Budget Reference Document in section 5.2 c) [page 8]. No changes to previous methodologies have occurred.

IPCAA

1. No comments

Comment 1. Noted

UCA

The UCA would like to request more transparency around the need and costs for Contracted Transmission Must-Run Service and Reliability Service:

Contracted Transmission Must-Run - The UCA is concerned that the forecasted TMR services cost is $2.8M in 2017.

1. Can the AESO explain the details of "the event of foreseeable TMR" that would require contracted services in 2017? Where is TMR service needed in the province?

Comment 1. Decreasing transmission capacity in the Northwest area of the province has resulted in the need for contracted TMR services as an interim measure until transmission reinforcements can be implemented. The need for TMR services in this area is currently being met through real-time TMR directives which are compensated under Section 11 of the ISO Tariff.

AESO Ancillary Services Costs Forecast for 2017
Do stakeholders have any comments on the Ancillary Services Costs forecast for 2017?

2. Can the AESO provide a breakdown of the $2.8M cost forecast for 2017 to further explain these contracted services?

Comment 2. As a contract is not yet in place, the 2017 forecast amount is an estimate of the potential costs based on previous experience with similar contracted TMR services.

3. Did the AESO run a competitive process to procure the TMR services? If yes, please provide details. If no, please explain why not.

Comment 3. No, a competitive process was not used given the location of the system issues and an insufficient number of effective generators to conduct a competitive process.

4. Please explain how this TMR service meets the requirements of the Transmission Regulation, section 15 and why it is allowed as an exception under section 15(3).

Comment 4. TMR is required to ensure reliable service as an interim measure until transmission reinforcements can be implemented in the area.

5. Can the AESO explain why entering this new contract is prudent or necessary compared to other options for addressing reliability requirements? Is the cost of the contracted TMR service is materially less than the cost of transmission wires over the contracted period?

Comment 5. The need for TMR in the area is currently being satisfied via real-time TMR directives and compensated via Section 11 of the ISO Tariff. The need for TMR in this area is foreseeable and the AESO is attempting to contract TMR services as a lower cost alternative. There is no wires alternative available over the contract period; the contracted TMR service will be used as an interim solution until transmission enhancements can be implemented.

Reliability Service - The UCA is concerned that the Reliability Service agreement with Powerex Corp. is forecasted to cost $2.9M annually for the duration of the contract regardless of whether these services are needed in that time or not.

6. Albertans have been paying for this service for well over a year. Please provide a detailed summary of the specific benefits that we have received for the service that we would not have received in its absence.

Comment 6. The Reliability Service agreement (RSA) provides access to energy or balancing services in the occurrence of high impact but low probability event of an energy shortfall or system restart event. While these risks have not materialized over the previous year, the RSA is similar in nature to an insurance product with the annual cost analogous to an insurance premium. The RSA provides the benefit of an increase ability to manage or recover from risks should they occur.

AESO Ancillary Services Costs Forecast for 2017
Do stakeholders have any comments on the Ancillary Services Costs forecast for 2017?

7. Can the AESO explain the details of the foreseeable event of supply shortfall that required the AESO to enter this agreement?

Comment 7. The RSA is intended to provide risk mitigation for supply shortfall or system restart events regardless of how they occur. Such situations can result from numerous events, all of which are probabilistic in nature. While the AESO implements Rules, Standards and operating procedures with the intention of avoiding such events, the reality is that no electricity system can be made 100% risk free.

8. Can the AESO explain what other options were evaluated to address reliability requirements?

Comment 8. The AESO evaluated obtaining similar services utilizing the Montana Alberta Tie Line (MATL) or from resources internal to the province.

9. Can the AESO explain why entering this new contract is prudent or necessary compared to other options for addressing reliability requirements? Is the cost of the agreement materially less than the cost of transmission wires over the 15 year period?

Comment 9. Other options do not provide the same level of operational flexibility or level of service. Additional transmission wires would not mitigate the risks covered by the RSA and as such are not a valid comparator.

AESO Transmission Line Losses Costs Forecast for 2017
Do stakeholders have any comments on the Transmission Line Losses Costs forecast for 2017?

ADC

1. No comments

Comment 1. Noted

AltaLink

1. No comments.

Comment 1. Noted

Capital Power

1. Currently, a new line loss rule is under review and subject to an AUC proceeding. It is estimated that new loss factors will be available and in effect starting in 2017. Also, the AESO has had almost a year of experience dispatching the two HVDC lines where minimizing total system losses was stated by the AESO as being one of three major operating principles. Both of these elements – new loss factor methodology and HVDC line operations - stand to impact the annual cost of losses. Please clarify whether the AESO's forecast 2017 transmission line losses gives consideration to these elements. If so, in what way did they impact the 2017 forecasted costs and if not, whether the AESO intends on incorporating these aspects for 2018 forecasted transmission line losses costs.

Comment 1. To correct one statement, loss factors impact the distribution or allocation of the costs of line losses among market participants but do not impact the costs. The impact of the two HVDC lines, which began operations in December 2015 is captured in eight months of the historical data that is used in developing the 2017 losses forecast.

As provided in the Supplementary 2017 Forecast and Budget Reference Document in section 6 a) [page 9]:
"The annual volume forecast for transmission line losses is based on the hourly forecast losses volumes, which are based on:

- **5-year historical actual losses volumes as a percentage of demand; and**
- **forecast load volumes."**

IPCAA

1. No comments. **Comment 1. Noted.**

UCA

1. The UCA does not have any comments on the Transmission Line Losses Cost forecast for 2017. **Comment 1. Noted**

Other Industry Costs Forecast for 2017

Do stakeholders have any comments on the Other Industry Costs forecast for 2017?

ADC

1. No comments

Comment 1. Noted

AltaLink

1. No comments.

Comment 1. Noted

Capital Power

1. Capital Power has no comment at this time.

Comment 1. Noted

IPCAA

1. Can the AESO provide a breakdown of the $1.5 M Regulatory Process Cost forecast?

Comment 1. The budget for Regulatory Process Costs is not developed through an analysis of specific proceedings given the uncertain nature of the issues that may present themselves during 2017. The table below provides additional details on the historical costs and budgets.

Regulatory Process Costs ($ million)	Typical Budget Cost Allocation	2017 Budget	2016 Budget	YTD Sept 2016 Actual	2015 Actual
AB Reliability Standards	Transmission		0.3	-	0.1
ISO Rules	Energy Market		0.6	0.3	1.0
ISO Tariff	Transmission		0.4	0.0	0.1
Need Identification Documents	Transmission		0.4	0.0	0.1
Other	Issue Specific		-	0.6	0.1
Total		1.5	1.6	0.9	1.4

AESO Transmission Line Losses Costs Forecast for 2017
Do stakeholders have any comments on the Transmission Line Losses Costs forecast for 2017?
UCA 1. The UCA does not have any comments on the Other Industry Costs forecast for 2017. **Comment 1. Noted**

AESO Own Costs Budget for the First 6 Months of 2017
Do stakeholders have any comments on the General & Administrative budget proposal for the first 6 months of 2017?

ADC

1. No comments

Comment 1. Noted

AltaLink

1. No comments.

Comment 1. Noted

Capital Power

1. Capital Power has no comment at this time.

Comment 1. Noted

IPCAA

1. The AESO's G&A costs are now very close to $100M (for a 1-year period). IPCAA submits that if the G&A costs exceed $100M they should be examined formally through the AESO's Tariff process, and not approved by the AESO Board directly.

Comment 1. Noted.

UCA

1. The UCA does not have any comments on the General & Administrative budget proposal for the first 6 months of 2017.

Comment 1. Noted

AESO Own Costs Budget for the First 6 Months of 2017
Do stakeholders have any comments on the Capital budget proposal for the first 6 months of 2017?
ADC 1. ADC reiterates that the AESO should include the functionality of a 15 minute settlement interval in any upgrade plans. **Comment 1. Noted. See AESO response to ADC Comment 1. in the Preliminary List of Business Initiatives section above.** **AltaLink** 1. No comments. **Comment 1. Noted** **Capital Power** 1. Capital Power has no comment at this time. **Comment 1. Noted** **IPCAA** 1. See EMS Question in Major Projects Comments section below **Comment 1. Noted** **UCA** 1. The UCA does not have any comments on the Capital budget proposal for the first 6 months of 2017. **Comment 1. Noted**

Major Projects Comments
Do stakeholders have any comments on the Energy Management System (EMS) or System Coordination Centre (SCC) Expansion project plans?

ADC

1. No comments

Comment 1. Noted

AltaLink

1. No comments.

Comment 1. Noted

Capital Power

1. Capital Power has no comment at this time.

Comment 1. Noted

IPCAA

1. What will the total Capital Cost of the EMS replacement be? How does this compare to the original capital estimates provided?

Comment 1. The total Capital Cost projection (as of August 31, 2016) for the EMS replacement project compared to the original Capital Estimate provided in the related Board Decision Document (2015-BRP-001) are presented in the table below:

($ millions)	Total Approved	2015 Actual	2016 Projected	2017 Budget	Total Project	Variance Amount	Variance (under budget)
EMS	**$31.7**	**$7.3**	**$16.4**	**$5.9**	**$29.6**	**($2.1)**	**(7%)**

UCA

1. The UCA does not have any comments the Energy Management System (EMS) or System Coordination Centre (SCC) Expansion project plans.

Comment 1. Noted

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

ADC

1. The ADC requests the AESO prioritize the publishing of an updated transmission rate impact projection (TRIP) model. This is a valuable tool for our members in budgeting future transmission costs.

Comment 1. The AESO acknowledges the value of TRIP information in supporting stakeholder budgeting and business decisions. During the 2016 BRP, the AESO committed to publishing an updated TRIP with the upcoming 2017 Tariff Application. The AESO expects to provide an update on the Transmission Rate Projections by Q1 2017.

AltaLink

1. AltaLink supports the AESO's 2017 business plan and interim budget proposal which will allow time for the AESO to incorporate the government's new policy initiatives into the BRP, when they become available, and to consult with stakeholders on these initiatives. AltaLink looks forward to participating in the AESO's consultation process in March 2017 concerning its detailed 18-month budget from July 2017 to December 2018.

Comment 1. Noted

Capital Power

1. Capital Power appreciates the AESO's effort to provide an estimated 2017 Energy Market Trading Charge as requested in Capital Power's previous comments. We look forward to participating in the forthcoming comprehensive Budget Review Process and detailed stakeholder consultation anticipated to begin in March 2017 covering the 18-month period from July 2017 to December 2018.

Comment 1. Noted

IPCAA

1. Can the AESO please publish an update to its Transmission Rate Impact Projection (TRIP) model? The current version is from June 2014 and customers have been requesting an update for several years now. This information is critical to budgeting and other business decisions.

Comment 1. Noted. See response to ADC Comment 1. above.

UCA

1. The UCA does not have any other comments to offer at this time. Thank you for the opportunity to provide comments for your consideration.

Comment 1. Noted