Appendix L – Cost Categories Summary

The AESO's total revenue requirement is split up into four main categories, and costs are recorded for these sub-categories as detailed in Appendix K[1] and listed below.

Descriptions of the categories and sub-categories are consolidated in this Appendix for reference.[2]

1. WIRES

a. TFO-Wires Related Costs

i. AltaLink

ii. ATCO Electric

iii. ENMAX Power Corporation

iv. EPCOR Distribution and Transmission

v. City of Lethbridge

vi. TransAlta Corporation

vii. City of Red Deer

viii. FortisAlberta (Farm Transmission)

b. Other Costs

i. Invitation to Bid on Credits (IBOC)

ii. Location Based Credit Standing Offer (LBC SO)

2. ANCILLARY SERVICES

a. Operating Reserve

i. Active – Regulating

ii. Active – Spinning

iii. Active – Supplemental

iv. Standby – Regulating

v. Standby – Spinning

vi. Standby – Supplemental

vii. Trading Fees & Other Related Charges

[1] See any of the "Costs" tabs of the Appendix K workbook.

[2] Descriptions are generally from AESO 2019 Business Plan and Budget Proposal.

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b. Other Ancillary Services

i. Black Start

ii. Transmission Must-Run (TMR)

iii. Load Shed Service for Imports (LSSi)

iv. Reliability Services from BC

v. Transmission Constraint Rebalancing (TCR)

vi. Poplar Hill

vii. Interruptible Load Remedial Action Scheme (ILRAS)

viii. Generator Remedial Action Scheme (RAS)

3. OTHER INDUSTRY COSTS

a. Regulatory Process Costs

b. Western Electricity Coordinating Council (WECC)

c. Share of Commission Costs

4. GENERAL AND ADMINISTRATIVE COSTS

a. Administrative Costs

i. Staff and Benefits

ii. Contract Services and Consultants

iii. Administration

iv. Facilities

v. Computer and Telecomm Services and Maintenance

b. General Costs

i. Interest

ii. Amortization

5. TOTAL CAPITAL

Wires - TFO Wires-Related Costs

Wires costs represent the amounts paid primarily to transmission facility owners (TFOs) in accordance with their Alberta Utilities Commission (AUC)-approved tariffs and are not controllable costs of the AESO. Wires costs include long-term contracts related to Invitation to Bid on Credit (IBOC) and Location Based Credit Standing Offer (LBC SO) programs, since these programs were initiated as incentives for generation to locate closer to major load centres and provide a non-wires solution to transmission wires issues in Alberta.

Wires - Other Costs

Wires costs also include costs related to invitation to bid on credit ("IBOC") and location based credit standing offer ("LBC SO") programs, which were initiated to provide a non-wires solution to transmission wires issues in Alberta and for which the AESO forecast costs in conjunction with ancillary services costs approved by the AESO Board

IBOC program is a long-term contract to incentivize generation to locate closer to major load centers. The program was initiated to provide a non-wires solution to transmission wires issues in Alberta and for which the AESO forecast costs in conjunction with ancillary services costs approved by the AESO Board.

LBC SO program is a long-term contract to incentivize generation to locate closer to major load centers. The program was initiated to provide a non-wires solution to transmission wires issues in Alberta and for which the AESO forecast costs in conjunction with ancillary services costs approved by the AESO Board.

Operating Reserve

Operating reserve is generating capacity or load that is held in reserve and made available to the system controller to manage the transmission system supply-demand balance in real time. Operating reserve comprises regulating reserve and contingency reserve (including spinning and supplemental reserve) with the minimum volumes of operating reserve required based on Alberta Reliability Standards.

Spinning and supplemental reserve is required in order to restore frequency following the loss of generation in Alberta or in the Western Electricity Coordinating Council ("WECC") region. Alberta reliability standards[3] set out requirements for maintaining specific volumes of spinning and supplemental reserve in order to maintain reliability.[4]

Operating Reserve – Regulating Reserve

Regulating reserve refers to 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. Regulating reserve tracks variations in demand that cannot be met with energy dispatches. Because variations in supply and demand can be either positive or negative, regulating reserve has a range with an upper and lower limit. The volumes of regulating reserve are specified as a range in megawatts over which a level of control is required by the AGC system.

Operating Reserve – Spinning Reserve

Spinning reserve is unloaded generation that is synchronized to the system, automatically responsive to deviations in frequency, and ready to serve 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.

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[3] BAL-002-WECC-AB1-2

[4] Refer to Consolidated Authoritative Document Glossary on the AESO website at www.aeso.ca by following the path AESO ► Rules, Standards and Tariff ► Consolidated Authoritative Document Glossary.

Operating Reserve – Supplemental Reserve

Supplemental reserve is unloaded generation, off-line generation or load that is ready to serve additional energy or reduce energy within 10 minutes of receiving an AESO system controller directive. Supplemental reserves are not required to respond to frequency deviations.

Operating Reserve – Active

Active operating reserve is required to automatically balance small changes in supply and demand and 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 define the minimum levels that must be procured.

The recorded cost of all active operating reserve is the product of volumes procured multiplied by operating reserve price, which is indexed to the hourly pool price. The costs are impacted by pool price fluctuations, supply of offered reserves and market participant offer behavior.

Operating Reserve – Standby

Standby reserve is additional reserve when the active operating reserves are insufficient to ensure system reliability. Pricing of standby operating reserve includes two components: (i) an option premium, paid for the capability to active the standby reserves, and (ii) an activation price, paid only if the standby reserves are activated.

Operating Reserve – Trading Fees & Other Related Charges

Trading fees paid to the operating reserve market online exchange, WattEx, and other related charges. May include recoveries related to non-compliance and liquidated damages.

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 procurements may not be feasible, through bilateral negotiations. These other ancillary services include black start, TMR, LSSi, reliability services, TCR, and Poplar Hills.

Other Ancillary Services – Black Start

Black start service is 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.

Other Ancillary Services – Transmission Must-Run (TMR)

TMR occurs when generation is required to mitigate the overloading of transmission lines associated with line outages, system conditions in real time or the loss of generation in an area. In circumstances when this service is required for an unforeseeable event and there is no contracted TMR, non-contracted generators may be dispatched to provide this service (referred to as conscripted TMR). In the event of foreseeable TMR, the AESO may enter into a contract with a generator to provide TMR services. The number of conscription events and event-related costs are difficult to forecast.

Other Ancillary Services – Load Shed Service for Imports (LSSi)

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 capacity ("ATC").

Other Ancillary Services – Reliability Services from BC

Reliability service is 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.

Other Ancillary Services – Transmission Constraint Rebalancing (TCR)

TCR service is provided 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 TCR under the ISO rules and would receive a TCR payment for energy provided for that purpose.

Other Ancillary Services – Poplar Hill

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

Other Ancillary Services – Import Load Remedial Action Scheme (ILRAS)

ILRAS is a product used to reduce constraints on imports over the BC interconnection during emergencies. Import available transfer capability from BC is currently limited to 600 MW or lower under normal operating conditions; the AESO can arm ILRAS to allow imports to be increased above 600 MW in emergency conditions.

Other Ancillary Services – Generator Remedial Action Scheme (RAS)

A RAS is a scheme designed to detect predetermined power system conditions and to automatically take corrective actions that may include, but are not limited to, adjusting or tripping generation (MW and MVar), tripping load, or reconfiguration a power system(s).

i.e. a RAS is used to mitigate post-connection system performance issues in a constrained area.

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.

Western Electricity Coordinating Council (WECC)

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.

Share of Commission Costs

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.

Administrative Costs

Administrative costs primarily relate to for general business travel, staff training and associated travel, corporate meetings and related meals, including costs related to stakeholder consultation sessions.

General Costs

General costs are interest costs; and costs for amortization of intangible assets and depreciation of property, plant and equipment.

Total Capital

Capital investment is required by the AESO for the development of information technology systems necessary to support the transmission function, infrastructure, and for leasehold improvements, furniture, and equipment. In particular, the development and acquisition of intangible and capital assets, including significant investment in information technology systems, is a key component of the AESO's business operations