AESO 2024
Business Plan and Budget Proposal

NOVEMBER 2023

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Table of Contents

Executive Summary

The AESO's *2024 Business Plan and Budget Proposal* (Proposal) outlines the organization's strategic focus, priorities and expenditures for the forthcoming year. It establishes the AESO's objectives for 2024, and the Proposal outlines the priorities it will focus on to meet those objectives. The Proposal also charts the AESO's organizational approach to achieving the objectives within its *2022 Strategic Plan*. The strategic plan defines and communicates the direction and focus of the organization and ensures the AESO and industry are well positioned to manage the transformative change impacting the electricity sector. Decarbonization is driving the transformation, spurred by government policy, as well as changing consumer preferences and optionality expectations. The result is shifting generation technologies. The AESO must ensure that new technologies and consumer requirements are reliably integrated into the power system, and that there continue to be opportunities to progress, develop or invest in Alberta's deregulated electricity industry.

The AESO is committed to providing a leadership role in enabling the transformation while maintaining system reliability, acting in the public's interest, and providing guidance to policymakers and industry. It is clear the work ahead of us is critical and timing is crucial. The pace of change continues to accelerate. We must be adequately prepared with the required expertise and resources to effectively deliver the AESO's priorities. A lack of proper execution and planning today could have far-reaching cost and reliability impacts in the future.

The AESO is required to consult on its budget as per the Transmission Regulation. The process includes strategically focused consultations that take place well in advance of the budget development cycle. Senior executive stakeholders meet one-on-one with a subset of Board and Executive members to share their perspectives on what they believed the AESO should be focusing on in the near term. For the current budget cycle, sessions held on June 1-2, 2023, outlined four themes of strategic importance that continued to align with the *AESO's 2022 Strategic Plan*. It is clear stakeholders recognize the integrated challenges the industry faces as Alberta's power system transforms. The AESO incorporated stakeholders' insights and expertise to inform its corporate focus areas and associated priorities for 2024.

The electricity sector is at a critical point where we need to evolve and innovate the entire power system, from wholesale and transmission down to retail and distribution, or face the unintended consequences of delaying decisions we cannot afford to delay. The AESO sees the system in its entirety, and it is clear to us that the entire value chain is being impacted in a number of ways by the large-scale adoption of renewable generation. This radical transformation in how electricity is produced, consumed and exchanged offers a compelling and exciting future. The AESO is also realistic in that it brings with it new challenges in grid management, infrastructure development, market design, affordability, and paramount to all, reliability. Among the challenges is uncertainty in policy, which has adverse effects on Alberta's deregulated market, including renewables integration, implications of decarbonization, and investment uncertainty. Navigating uncertainty through the transformation requires the AESO to be agile in the execution of our mandate, which in turn has implications for our planning and budget process. The case for change is clear and the AESO must start moving the needle in some key areas. The need to effectively address the complex transformation is driving increased funding requirements.

To be agile in the face of uncertainty, the AESO must be able to continuously pivot, incorporating new information to deliver the most effective and affordable solutions. Given the critical need for agility, the AESO must approach all aspects of its business with this mindset, including its approach to prioritizing and budgeting. The 2024 Budget incorporates the minimum costs considered necessary to deliver the AESO's

mandate; however, the considerable uncertainty in policy pathways creates the potential for future adjustments. Recent publications by the AESO document the significant impact to the Alberta Interconnected Electric System (AIES) from the rapid transformation of the electricity industry, which has been reiterated by industry and realized by the AESO in managing the grid. There is significant and critical work that must be done to ensure the reliability of the electric system is maintained and markets are efficient in supplying Alberta's energy future. These priorities form the basis for costs underlying the 2024 Budget, for which significant drivers are discussed in this document. Potential policy pathways will impact the timing, priority and significance of the work required to deliver on these priorities.

Accordingly, the AESO is requesting an increase to its General and Administrative Budget to manage this current and anticipated future growth. Based on the *AESO's 2022 Strategic Plan* and corresponding alignment with recently identified stakeholder themes, Management has determined that "Enabling Transformation" remains its key focus in 2024 and will concentrate its efforts and financial resources accordingly.

Going forward, the AESO will continue to efficiently and effectively deliver on its public interest mandate to create value for stakeholders and the province. By performing the work defined within this Proposal, the AESO will reinforce its leadership role in enabling the transformation of the province's electricity sector while ensuring safe, reliable, and affordable power is available to Albertans.

The draft budget, incorporating the focus areas and priorities, was presented to the Board for its initial input and discussion in September. The AESO then presented the proposed budget for stakeholder input in early October. During that step the AESO was seeking to affirm, based on the June stakeholder consultations, that it had determined the appropriate areas of focus and priorities for its work in the upcoming year; that it had not missed something crucial in its priorities to support the future of electricity in the province; and that it had considered associated impacts in developing the 2024 budget.

Summary of the Aggregated Forecast and Budgeted Costs for 2024 ($ million)

	2024 Forecast/ Budget	2023 Forecast/ Budget[1]	$ Variance	% Variance
Transmission Operating Costs	**2,479.4**	2,405.1	74.3	3
Other Industry Costs	**25.0**	25.0	0.0	0
General and Administrative	**129.1**	108.3	20.8	19
Borrowing Costs	**0.7**	1.0	(0.3)	(30)
Amortization and Depreciation	**25.3**	23.3	2.0	9
Capital Expenditures	**47.9**	25.6	22.3	87

Differences are due to rounding

[1] Amounts are from the 2023 Budget Development Process (BDP).

Background

Stakeholder Engagement

The AESO believes earlier involvement and engagement amongst the Board, the Executive and stakeholders is essential; this includes communicating clear expectations on the process and ultimate budget outcome. The current approach provides greater opportunities for the AESO to gain stakeholder insight on areas of focus earlier in the process. It also facilitates a more meaningful exchange with stakeholders as it enables an opportunity for stakeholders to influence the type, timing and priority of work the AESO undertakes. Stakeholder insights on these matters assist the AESO with the allocation of its staff resources and the determination of consulting and capital expenses. The AESO budget, including what is allocated for its workforce, has typically not been subject to significant swings on a year-to-year basis. As such, the AESO budget has remained largely consistent year over year as it works to meet its legislated mandate unless significant industry initiatives are undertaken.

Below are the four strategic areas (themes of strategic importance), outlined by stakeholders at the June 1-2 meetings with the AESO Board:

Reliability remains paramount – Stakeholders expressed the importance of addressing system reliability through the transformation and continuing to build on the work of the 2023 Reliability Requirements Roadmap into 2024. They want to ensure that the AESO and all stakeholders are actively and effectively working together to ensure grid resiliency and to address challenges posed by increased integration of renewables in the supply mix. The AESO heard it is crucial it maintain its unwavering focus on grid resiliency and reliability, that it build a strong understanding of the various issues and challenges posed by a transforming grid, and that it work with stakeholders to develop and implement appropriate measures to address these challenges.

Market evolution – Generators continue to be concerned with the sustainability of the market going forward given the influx of renewables and the potential pathways to decarbonization. Common consensus was that change is urgently needed to maintain a well-functioning market, and a clear message was given that the AESO should take a strong leadership role to foster market fidelity and investor confidence through this transformation. In terms of specific changes, many stakeholders mentioned revisiting the cost allocation for transmission and evolving the existing premise that load pays.

Affordability and cost of delivered energy – Stakeholders continue to be concerned about the rising cost of delivered energy and want to see more collaboration and stakeholder engagement to develop meaningful solutions for both large and small consumers. Stakeholders see this as an important focus area and believe the AESO is best positioned with its end-to-end system view to facilitate this work and to balance polarized interests while ensuring safe, reliable, affordable power is always available to Albertans.

Policy clarity – As the system moves towards carbon neutrality, stakeholders want the AESO to work closely with policymakers to provide more clarity on decarbonization and the integration of new technologies into our power system. They want more certainty and policy clarity when making investment decisions. Stakeholders emphasized the vital leadership role of the AESO in providing guidance and analysis to both industry and the provincial and federal governments, where possible, regarding feasible timelines to achieve carbon neutrality in a reliable and affordable manner.

Stakeholders conveyed their understanding of the significant and complex issues facing the industry, and the need for the AESO to be appropriately resourced to meet these urgent challenges and make the

necessary changes to ensure continued reliability and affordability in a decarbonized future. The volume and pace of change is increasing, and they stressed how imperative it is that the AESO is staffed appropriately to effectively deliver on its mandate. The AESO considered the stakeholders' thoughtful observations, ideas and expertise to identify its corporate focus areas and associated priorities for 2024 and beyond.

Enabling the Transformation

The pace and change in the connection space continues to increase. Connection projects have become more complex, requiring longer durations and more effort per project to manage, compounded by an overall increase in volume. Resources are needed to manage an increased workload of system applications; Montana Alberta Tie Line (MATL), Western Electricity Coordinating Council (WECC) Path rating, AB/SK, impact of small modular reactors (SMR), hydrogen, carbon capture utilization, and storage (CCUS), etc., as well as the need for engineers to support the additional projects. Changes to the connection process require additional resources to ensure the design expectations are delivered in a timely manner. There continues to be a high volume of interest in generation and storage applications in Alberta even after the seven-month pause on approval of all power plant applications for renewable energy announcement in August 2023.

The pace and change extend beyond the connection space. The electrification of the pipeline industry is coming, and coordinated planning is necessary and imminent. The magnitude of load required will have significant impacts that need to be assessed and managed. Request for Information work continues to fall behind day by day, and additional compliance support for generators on how they are responding to frequency events is needed.

There is significant competition for required technical expertise. The pool of System Controllers (SCs) and Engineers with required knowledge and expertise is limited and shared with the rest of industry, creating pressures on retention. Ensuring resources are available includes the need for additional SCs and Engineers-in-Training (EITs), driven by low retention and proximity to retirement age. Uncertainty and increasing complexity, processes, projects and technical expertise requirements drive the need for core business functions to support agility and the prioritization of strategic work.

The radical transformation in how electricity is produced, consumed and exchanged has already begun, but the path to navigate its course is uncharted and uncertain. What is certain is the need to be agile, focused and prepared for potential changes in direction, pace and outcome. To ensure the industry is prepared, we must address the grid management, infrastructure development, market design, affordability, and reliability concerns faced today and develop insight into what tomorrow may bring. The AESO's budget reflects the critical nature of the work ahead. While the path may diverge and the ultimate outcome may vary, the need to act is now, or risk unintended consequences.

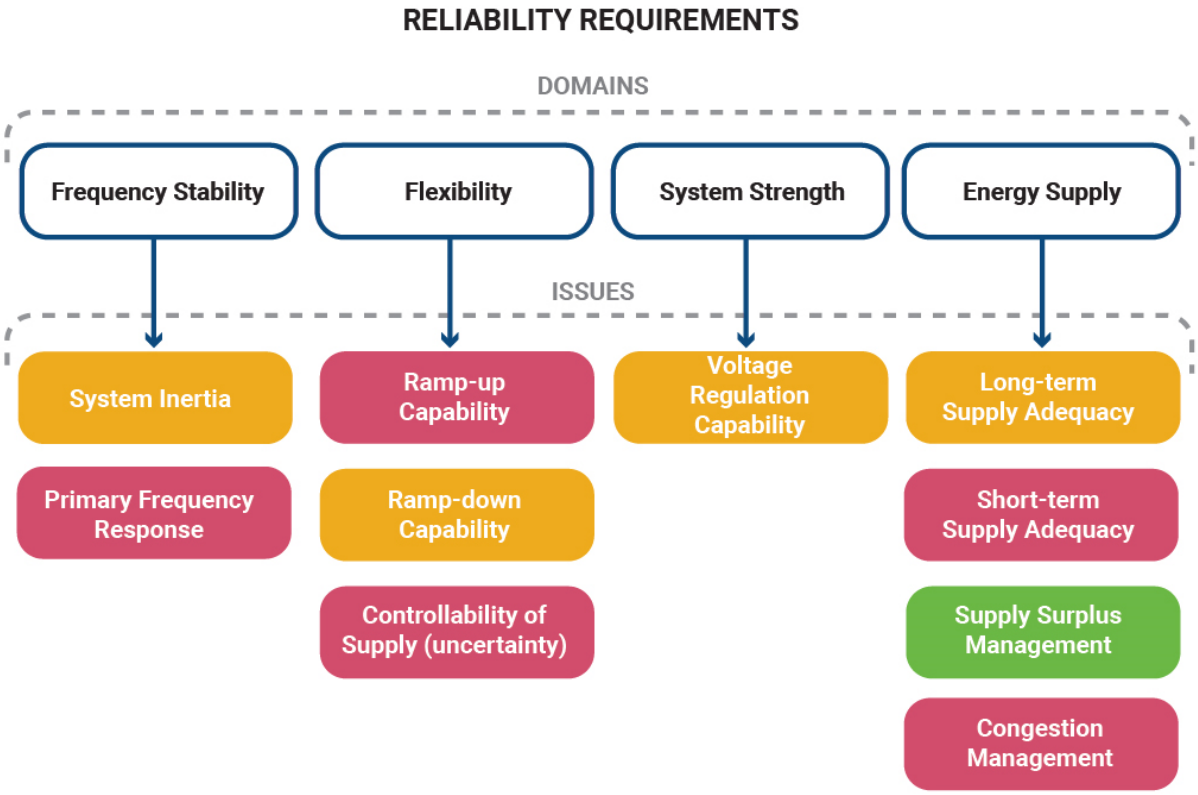
Priorities

Building on the AESO's Strategic Plan and the corresponding alignment with the identified stakeholder themes of strategic importance, as mentioned, Management has determined that "Enabling Transformation" will continue to be the prominent focus area for 2024 and the AESO will concentrate its efforts and resources in its budgeting process, accordingly. Additionally, in alignment with the above, the following priorities have been identified for 2024: **Reliability; Market Evolution; Affordability; Policy Clarity and Connection Process Streamlining.** Below are some additional details on the priorities as well as some other related important factors/considerations and/or means identified to deliver on the priorities.

Reliability

Reliability is paramount, as the AIES continues to transform and new information on specific trends impacting the timing or direction of the transformation becomes available, the impacts of these changes will need to be continuously analyzed to ensure current and future reliability implications are understood and mitigated. The greatest challenge from a resourcing/talent perspective is the ability to perform the necessary studies and analysis to support reliability through the transition.

Increased analysis in the four domains (below) is required to respond to the issues in a timely manner. There is a need for more complex congestion, restoration and dynamic studies, as well as identifying and analyzing the impacts from electrification of the load.



The colour assigned to each issue in the above figure corresponds to the urgency of the issue. Red indicates that the issue is of high urgency, yellow indicates medium urgency, and green indicates low urgency.

Critical Systems and Data

Operational readiness is pervasive. There is a need for critical systems operational readiness for the Transformation that is being driven by an increasing number and complexity of systems in recent years with increases expected to continue, and at a faster pace. Assessment and implementation of tools is necessary to improve capabilities for modelling and maintaining situational awareness.

There is a need for additional cyber protections driven by the growth in number and complexity of systems due to both digital and grid transformation, in addition to rapidly growing cyber threats.

Advancement in digital and data technology is one of the drivers of the global electricity transformation. Resources are needed to advance the AESO's Data Strategy to enhance the accessibility and use of data for AESO and stakeholder decision-making and prepare for increased application and pace of digitalization within our industry. Building continuity and skills related to business intelligence, analytics, and data

engineering are critical for building a successful data program. The AESO will utilize the conversion of current contracted employees to gain efficiencies in onboarding, cost and productivity.

Grid Management

Operational readiness is critical. Real-time operational challenges have increased due to the rapid pace of renewables generation connecting to the grid, including the appearance of multiple congestion areas that require continuous mitigation. Additionally, outage planning, outage management and forced outage response in weaker areas of the system are becoming more complex. To ensure the continued safe, reliable and economic operation of the transmission system, additional investment is required for studies, data collection and storage, modelling upgrades and monitoring tools. This requires engineering resources for reliability, operational complexity, policy advice and more complex modelling; congestion management and analytics; system restoration work and engineers/application resources for increased support of technology tools in the Control Room.

The AESO must be aware, informed and adequately prepared operationally for the impacts of the rapid pace of transformation. This includes ensuring that Grid Operations can analyze what it is observing in real time and inform the rest of the organization.

Market Evolution

The AESO believes that a well-defined electricity framework that leverages competitive forces will yield the most efficient, lowest-cost outcomes for Albertans. Alberta's current energy market is already experiencing the impact of the transformational change occurring in the electricity system, including increased participation of zero-priced offers and short-term supply adequacy concerns. Given the transformation in the system, the market structure and rules need to be revisited to ensure a robust, fair, efficient and openly competitive (FEOC) platform for attracting investment and maintaining reliability going forward. The current Transmission Regulation was written in 2005, when supply adequacy was the primary concern, provided by conventional generation that shared roughly the same development timelines as our transmission system. The framework is not adequately meeting the needs of today.

As we are embarking on significant change in the market design and potential tariff and commercial activities, an incremental number of resources are required to support and build greater sustainability in the activities of design, stakeholder engagement, analysis, regulatory process, government relations and project management.

Fostering Engagement

It is increasingly important for industry leadership to collaborate and work together in novel ways. Continuing to build on our engagement with stakeholders is critical to the AESO's success. The breadth of stakeholders that influence our planning and decisions is vast, as are their specific needs, interests and priorities. We understand that the decisions we make and the actions we take in delivering our mandate affect many different stakeholders and we are dedicated to ensuring we understand the forces impacting the industry, which is vital to making informed decisions.

Knowledge sharing will drive the industry forward as a tool to navigate uncertainty and inform broader decision making. The continued complexity of the transformation and growth in the number of stakeholders invested in its outcome require greater levels and types of engagement.

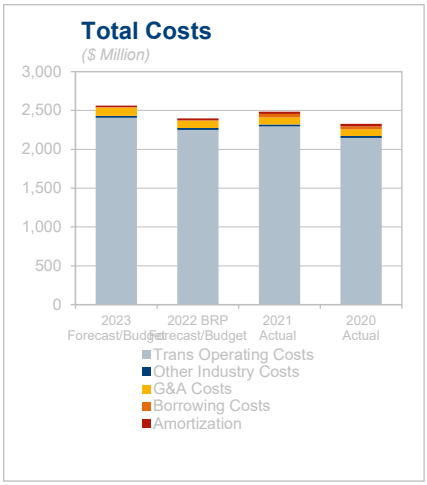
Financial Highlights

As part of this *2024 Business Plan and Budget Proposal*, the AESO is presenting the forecasts and budgets which are required to meet the needs of the organization to deliver on its commitments and to demonstrate that financial management continues to be a focus.

The financial information is presented in the following four sections:

- **Section I** – Transmission Operating and Other Industry Costs
- **Section II** – General and Administrative, Borrowing Costs and Amortization and Depreciation
- **Section III** – Capital Costs
- **Section IV** – Revenue

Additional information is included in Appendices A through D.



($ million)

	2024 Forecast/ Budget	2023 Forecast/ Budget[2]	$ Variance	% Variance	2022 Actual	2021 Actual
Transmission Operating Costs	**2,479.4**	2,405.1	74.3	3	2,801.8	2,296.6
Other Industry Costs	**25.0**	25.0	0.0	0	24.7	21.6
General and Administrative	**129.1**	108.3	20.8	19	97.9	91.8
Borrowing Costs[3]	**0.7**	1.0	(0.3)	(30)	0.6	47.1
Amortization and Depreciation	**25.3**	23.3	2.0	9	24.1	28.1
Capital Expenditures	**47.9**	25.6	22.3	87	23.2	22.4

Differences are due to rounding

[2] Amounts are from the 2023 BDP.

[3] 2021 Actual amount includes $45.8 million of interest costs related to Loss Factor resettlements, which was largely offset by interest revenues not presented here. Excluding this balance, 2021 Actual amount is $1.3 million.

Section I – Transmission Operating and Other Industry Costs

Transmission Operating Costs

The following table provides a summary of transmission operating costs.

Transmission Operating Costs ($ million)

	2024 Forecast	2023 Approved Forecast[4]	$ Variance	% Variance	2022 Actual	2021 Actual
Wires Costs	**1,937.2**	1,918.3	18.9	1	1,933.8	1,713.6
Transmission Line Losses	**178.3**	183.8	(5.5)	(3)	332.7	201.8
Operating Reserves[5]	**308.4**	265.5	42.9	16	494.1	333.7
Other Ancillary Services Costs	**55.5**	37.5	18.0	48	41.2	47.5
Transmission Operating Costs	**2,479.4**	**2,405.1**	**74.3**	**3**	**2,801.8**	**2,296.6**

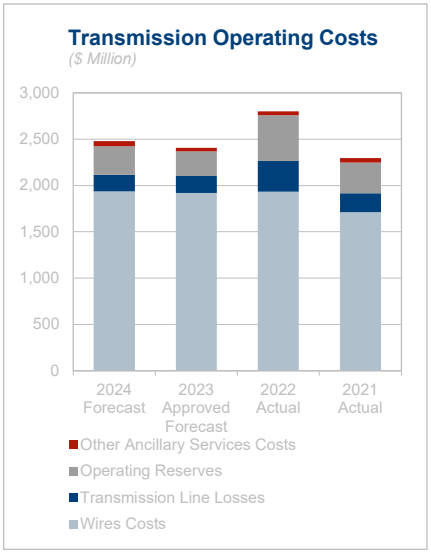
Differences are due to rounding

Additional information on the 2024 forecast methodology and descriptions of the cost categories is provided in Appendix B (Transmission Operating Cost Definitions).

Wires Costs

Wires costs represent the amounts paid primarily to transmission facility owners (TFOs) in accordance with their Alberta Utilities Commission (AUC) approved tariffs. They are not controllable costs of the AESO, nor are they approved by the AESO Board.

In the 2023 Approved Forecast and prior years, wires costs included 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. These contracts have since expired and are no longer included in the 2024 Forecast.



The 2024 forecast is based on TFO tariffs of $1,937.2 million (2023 - $1,917.9 million), which have been approved or applied-for as of August 2023 with a majority of the forecast reflecting: i) filed 2024 tariffs; ii) filed 2024 negotiated settlements; or iii) AUC approvals for 2023 and 2024 tariffs. The 2023 approved forecast also included the AESO's forecast for LBC SO costs of $0.4 million, which is nil for 2024.

[4] Amounts are from the 2023 BDP.
[5] Includes both contracted and conscripted operating reserves.

Transmission Line Losses

The 2024 forecast for transmission line losses is three per cent lower than the 2023 approved forecast. This decrease is primarily attributable to a decrease in the 2024 forecasted average pool price of $83 per megawatt hour (MWh), which is 12 per cent lower than the 2023 forecast of $94 per MWh. The lower anticipated average pool price can be primarily attributed to the additional capacity expected on the grid as large thermal assets will be entering commercial operations and increased renewable generation is expected to come online in 2024.

The 2024 transmission line losses volumes forecast is 2,077 gigawatt hours, which is nine per cent higher than the 2023 forecast of 1,906 gigawatt hours. This increase in primarily due to the expectation of increased exports, congestion and constraints in certain areas, as well as wildfires.

Operating Reserves

The 2024 forecast for operating reserves costs is 16 per cent higher than the 2023 approved forecast. The cost of operating reserves is impacted by actual volumes, hourly pool prices, and operating reserve prices.

The 2024 operating reserves volumes forecast is 6.4 terawatt hours, which is six per cent lower than the 2023 approved of 6.8 terawatt hours.

The average pool price used for the 2024 forecast is $83 per MWh, which is 12 per cent lower than the 2023 forecast of $94 per MWh.

Contributing to higher operating reserve costs is the expectation that standby reserves will be activated more often to compensate for intermittent generation as well as the increase in procurement volumes in the regulating reserves active market. The active operating reserves prices are the most significant operating reserve costs and are derived from pool price and a premium or discount to pool price. During periods of low pool prices, the discounts offered reflect the offer strategies associated with the lower pool prices, which are low or small discounts. In periods of higher pool prices, the discounts will typically increase to correspond with the higher pool prices. While the price of operating reserves procured is indexed to the pool price, changes to the average pool price do not result in proportional changes to the operating reserve costs. The premiums and discounts used in the 2024 forecast are derived from the April 2021 through June 2023 operating reserve prices and follow the established forecast methodology.

Other Ancillary Services Costs

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

Other Ancillary Services Costs ($ million)

	2024 Forecast	2023 Approved Forecast[6]	$ Variance	% Variance	2022 Actual	2021 Actual
Load Shed Service ("LSS"), Fast Frequency Response ("FFR"), Voluntary Load Curtailment Program ("VLCP") and Transferred Frequency Response ("TFR")	**42.1**	26.6	15.5	58	30.7	31.4
Transmission Must-Run ("TMR") – Contracted and Conscripted	**3.7**	4.3	(0.6)	(14)	3.3	8.1
Reliability Services	**2.9**	2.9	-	-	2.9	2.9
Black Start	**2.8**	2.7	0.1	4	2.5	2.4
Transmission Constraint Rebalancing ("TCR")	**4.0**	1.0	3.0	300	1.8	2.7
Other Ancillary Services Costs	**55.5**	**37.5**	**18.0**	**48**	**41.2**	**47.5**

Differences are due to rounding

The 2024 forecast for other ancillary services costs is 48 per cent higher than the 2023 approved forecast primarily due to the following.

LSS, FFR, VLCP and TFR costs for 2024 are forecast to be 58 per cent higher than the 2023 approved forecast and are based on the expected operations of the transmission system in 2024. These costs reflect contract pricing for LSS and FFR services, taking into consideration the introduction of eight new units into these programs, as well as historical availability levels and forecast import and arming volumes. VLCP costs are forecast based on historical actual trends. TFR costs are forecast based on recently negotiated competitively procured pricing.

The 2024 forecast for TMR is 14 per cent lower than the 2023 approved forecast, primarily due to lower forecast conscripted events resulting from the TMR contract in place.

The 2024 forecast for TCR is 300 per cent higher than the 2023 approved forecast. This is primarily due to increased congestion on the grid resulting from renewables energization and is consistent with the increase in costs experienced in the first half of 2023.

Other Industry Costs

Other industry costs are those not under the direct control of the AESO or those that could not have been forecast prior to the budget year in which they arose. They include mandatory administration and membership fees, regulatory proceeding costs, other regulatory process costs, unforeseen litigation costs, and non-compliance penalties. Mandatory administration and membership fees relate to the annual administration fee for the AUC, the AESO's share of WECC, Western Power Pool (WPP) and North America Electric Reliability Corporation (NERC) membership fees. Regulatory process costs are associated with the AESO's involvement in AUC proceedings and costs incurred to respond to specific agency-related

[6] Amounts are from the 2023 BDP.

directions or recommendations that are beyond the routine operations of the AESO. This does not include application preparation costs.

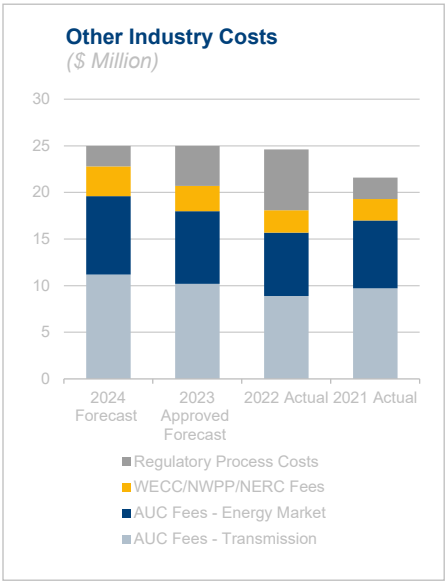
Other Industry Costs ($ million)

	2024 Forecast	2023 Approved Forecast [7]	$ Variance	% Variance	2022 Actual	2021 Actual
AUC Fees – Transmission	**11.2**	10.2	1.0	10	8.9	9.7
AUC Fees – Energy Market	**8.4**	7.8	0.6	8	6.8	7.3
WECC/NWPP[8]/NERC Fees	**3.2**	2.7	0.5	19	2.4	2.3
Regulatory Process Costs	**2.2**	4.3	(2.1)	(49)	6.5	2.3
Other Industry Costs	**25.0**	**25.0**	**0.0**	**0**	**24.7**	**21.6**

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/WPP/NERC Fees

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

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

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

[7] Amounts are from the 2023 BDP.
[8] Northwest Power Pool

Regulatory Process Costs

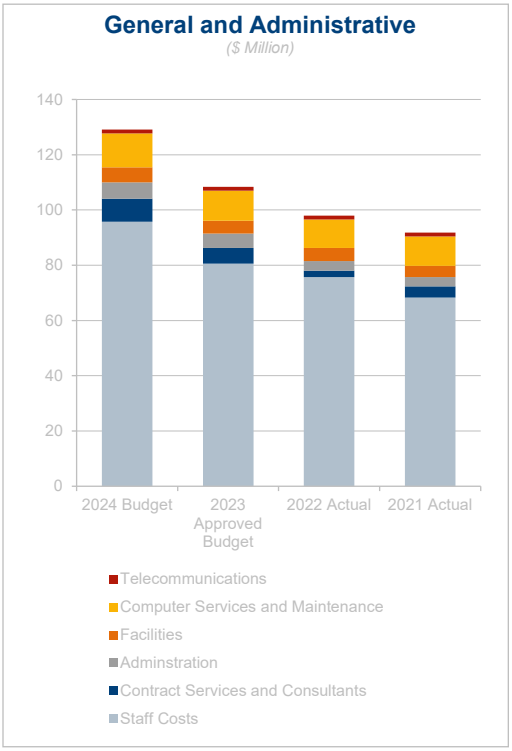
Costs associated with the AESO's involvement in an AUC proceeding, excluding application preparation costs, are included in the cost category Regulatory Process Costs. These proceedings become a high priority relative to other business initiatives that were identified in the business planning process, 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 2024 forecast for regulatory process costs is 49 per cent lower than the 2023 approved forecast primarily due to a reduction in the estimated number of complex regulatory proceedings and litigation matters that are expected to be heard before the AUC and the Courts.

Section II – General and Administrative, Borrowing Costs and Amortization and Depreciation

2024 Budgets

The following table provides a summary of the general and administrative costs budgeted for 2024. AESO Management believes these costs appropriately represent the resources required to successfully deliver on the strategic focus and priorities outlined in earlier sections of this Proposal, while continuing to provide the safe, reliable and affordable operation of the electric system in Alberta.



The AESO is committed to its ongoing leadership role in enabling the transformation of the province's electricity sector and will continue to efficiently and effectively deliver on its strategic focus areas to create value for stakeholders and the province as a whole.

In preparing the Proposal, AESO Management considered the information currently available to assess the impact on both the strategic plan and budget requirements. As time progresses, new information or events may require a change to the AESO's focus areas that if material in nature, may require further stakeholder and AESO Board consideration on the impact. Appendix D highlights the circumstances and processes that would be undertaken in these circumstances.

General and Administrative Costs

General and Administrative Costs ($ million)

	2024 Budget	2023 Approved Budget[9]	$ Variance	% Variance	2022 Actual	2021 Actual
Staff Costs	**95.7**	**80.6**	15.1	19	75.7	68.3
Contract Services and Consultants	**8.4**	**5.6**	2.8	50	2.3	4.1
Administration	**5.9**	**5.3**	0.6	11	3.5	3.3
Facilities	**5.4**	**4.6**	0.8	17	4.7	4.1
Computer Services and Maintenance	**12.3**	**10.9**	1.4	13	10.4	10.6
Telecommunications	**1.4**	**1.4**	-	-	1.3	1.4
General and Administrative Costs	**129.1**	**108.3**	**20.7**	**19**	**97.9**	**91.8**

Differences are due to rounding

The AESO's 2024 proposed general and administrative budget represents a 19 per cent increase from the 2023 approved budget and reflects the estimated growth in resources required to continue to deliver on its capacity as a leader in enabling the accelerated transformation of the electricity industry in Alberta.

Each of the general and administrative costs categories above are discussed in more detail in the sections that follow.

Significant variances from the 2023 approved budget are as follows:

($ million)	
2023 Approved Budget	**$ 108.3**
Additional resources to deliver on strategic work	6.6
Impact of market, inflation, timing and turnover on staff costs	8.5
Contract service and consultants	2.8
Increase in Board remuneration	0.1
REP land registration fees	0.5
Increase in facilities costs (operating costs, utilities, taxes, etc.)	0.8
Increase in IT maintenance and telecommunications costs	1.4
2024 Proposed Budget	**$ 129.1**
Forecasted connection fee revenue offset	**(4.2)**
2024 Proposed Budget Impact	**$ 124.9**

[9] Amounts are from the 2023 BDP.

Differences are due to rounding

Staff Costs

The AESO maintains market-based compensation for staff which incorporates a benefits plan, pension plan and a performance-based variable pay program.

Budgeted staff costs for 2024 are 19 per cent higher than the 2023 approved budget. This increase reflects market adjustments for 2023 and proposed adjustments for 2024 of $2.8 million and $4.0 million respectively, resulting from the Government of Alberta's lifting of the Salary Restraint Regulation in July 2022. Prior to this, the AESO had been under a salary freeze for approximately six years. These market adjustments, along with a proposed $6.6 million in additional resource needs are paramount to the AESO's ability to retain and attract the talent it requires to continue to deliver on its strategic work in 2024.

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

Base pay adjustments – The AESO continues to review the general economic indicators and salary survey information to determine the impact on employee compensation. The proposed market adjustment for 2024 is five per cent, which also takes into consideration adjustments to employee compensation for inversions, compressions and promotions. Should market data support salary increases of up to eight per cent, an additional $2.0 million market adjustment may result.

Variable pay program – The AESO's variable pay program is based on an assessment of corporate and individual performance, as aligned to corporate objectives and key results. Variable pay targets were reduced in July 2022 with the introduction of the AESO's defined contribution pension plan.

Benefit costs – In addition to their salary, each employee participates in the organization's comprehensive benefit plan. This represents costs such as health and dental coverage, a defined contribution pension plan effective July 2022, a post-retirement benefit plan and federal payroll taxes. These costs are presented as a percentage of salary costs to determine a "benefits load factor". With the addition of the pension plan in 2022 and increasing health and dental benefits costs experienced in recent years, the overall costs are budgeted at 29 per cent for 2024, a slight increase over the 2023 budgeted costs of 27 per cent.

Connection fee revenue of $4.2 million has been forecasted for 2024. This revenue will offset, in large part, budgeted staff costs to provide connection study services and appropriately manage the growing connections queue, as well as other associated but less material budgeted general and administrative costs.

Contract Services and Consultants

($ million)

	2024 Budget	2023 Approved Budget[10]	$ Variance	% Variance	2022 Actual	2021 Actual
Consulting	**5.9**	4.3	1.6	37	2.1	3.2
Legal	**2.4**	1.2	1.2	100	0.2	0.8
Audit	**0.1**	0.1	-	-	0.1	0.1
Contract Services and Consultants	**8.4**	**5.6**	**2.8**	**50**	**2.3**	**4.1**

Differences are due to rounding

Contract services and consultants costs typically vary from year to year based on requirements to meet business initiatives or strategic focus areas.

Budgeted contract services and consultants costs for 2024 are 50 per cent higher than the 2023 approved budget. This increase is reflective of the significant work ahead of the AESO in its capacity to lead the transformation of the electricity industry, which requires specific skill sets that may not exist within the AESO.

Consulting – The AESO hires consultants to supplement staff resources for two general purposes. The first is when it is not practical to permanently retain staff with specific skill sets that may only be required for certain initiatives. In these circumstances, consultants are utilized to either complete the work or assist in training AESO staff. The second purpose is to hire consultants to address workload peaks to maintain seamless operations and continual progression on strategic focus areas.

Legal – Legal counsel is retained to support general business operations by supplementing in-house legal resources and to provide expertise on regulatory filings and more complex commercial matters. Costs associated with the AESO's involvement in an AUC proceeding to hear objections and complaints to ISO rules or any regulatory application are included in the cost category of other industry costs - regulatory process costs, as opposed to the general and administrative cost category.

Audit – The professional services of third parties are used to conduct audits or reviews on AESO processes, systems or reporting.

In 2024, $4.4 million of contract services and consultants costs are budgeted to primarily support strategic initiatives. The connection fee revenue forecasted for 2024 will, in part, serve to offset the $0.4 million in contract services and consultants costs budgeted to provide connection study services.

[10] Amounts are from the 2023 BDP.

Administration

($ million)

	2024 Budget	2023 Approved Budget[11]	$ Variance	% Variance	2022 Actual	2021 Actual
Travel and Training	**1.4**	1.4	-	-	0.5	0.3
Insurance	**1.7**	1.8	(0.1)	(6)	1.4	1.1
AESO Board Fees	**0.6**	0.5	0.1	20	0.4	0.4
Other Administrative	**2.2**	1.6	0.6	38	1.2	1.5
Administration	**5.9**	**5.3**	**0.6**	**11**	**3.5**	**3.3**

Differences are due to rounding

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

Budgeted administration costs for 2024 are 11 per cent higher than the 2023 approved budget. The increase is primarily associated with $0.5 million in budgeted one-time land registration fees related to the administration of the Renewable Electricity Program contracts.

Travel and Training – The travel and training category covers costs incurred for general business travel, staff training and associated travel, corporate meetings, and related meals, including costs related to stakeholder consultation sessions.

Insurance – The *Electric Utilities Act* (EUA) provides limited statutory protection for the business risks of the AESO organization, directors, officers, and staff. To ensure business risks are properly insured, the AESO carries insurance for exposures not covered by the EUA, specifically for direct damages resulting from negligence. The AESO has statutory protection for indirect damages, which would typically be the most costly damages that would occur for business interruption and lost revenue.

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

Other Administrative Costs – This category includes corporate subscriptions/memberships and professional membership fees, general office costs, corporate relations and recruiting.

Facilities

Facilities costs are associated with rent and operating costs for the AESO's three office locations: i) the main offices in downtown Calgary which are leased through long-term lease arrangements; ii) the AESO

[11] Amounts are from the 2023 BDP.

Operations Complex (AOC), which includes the System Coordination Centre (SCC) and additional office space, all of which is owned and operated by the AESO; and iii) additional space for the AESO's Back-Up Coordination Centre to accommodate redundant computer systems to support seamless operating performance in the event of a disruption to the operations at the SCC.

To accommodate staff and contract resources in the main offices, 105,000 square feet of office space is currently leased through agreements that will expire in 2024. The AESO has secured 90,201 square feet of newly leased office space for a 10-year term commencing January 1, 2025. Due to their long-term nature, these leases are classified as right-of-use assets and corresponding right-of-use liabilities in accordance with IFRS 16. Amortization of the right-of-use assets is captured as amortization of intangible assets, with interest related to the time value of money captured as borrowing costs. Short-term and immaterial leases remain classified as rent.

Budgeted facilities costs for 2024 are 17 per cent higher than the 2023 approved budget. The increase is primarily associated with market driven utilities, taxes and operating costs observed in the first half of 2023, which are expected to continue throughout 2024.

Computer Services and Maintenance

On an annual basis, the AESO invests in software applications and systems to support the business and IT infrastructure needs, which then require ongoing maintenance and licence agreements to support the high availability requirements of these systems. The AESO operates with a managed services model[12] for IT infrastructure operating support (e.g., network, database, and middleware platforms).

Budgeted costs for 2024 are 13 per cent higher than the 2023 approved budget. The increase is driven by a number of factors, including increased software and licensing costs, the movement of capital costs to general and administrative as software tools are commissioned and placed into service, and inflationary and foreign exchange impacts observed in the first half of 2023 which are expected to continue into 2024.

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 grid and market 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.

Budgeted costs for 2024 are consistent with the 2023 approved budget.

Borrowing Costs and Amortization and Depreciation

($ million)

	2024 Budget	2023 Approved Budget[13]	$ Variance	% Variance	2022 Actual	2021 Actual
Borrowing Costs[14]	**0.7**	1.0	(0.3)	(30)	0.6	47.1
Amortization and Depreciation	**25.3**	23.3	2.0	9	24.1	28.1

[12] A managed services model is where the AESO transfers the day-to-day management and operations of a support function (not the strategic management) to a third-party provider. With this support approach the AESO is able to leverage available technical resources and tools to provide more effective support for its critical processes. The managed services approach facilitates resource efficiencies and improves reliability.
[13] Amounts are from the 2023 BDP.
[14] 2021 Actual amount includes $45.8 million of interest costs related to Loss Factor resettlements, which was largely offset by interest revenues not presented here. Excluding this balance, 2021 Actual amount is $1.3 million.

Differences are due to rounding

Borrowing Costs

Borrowing Costs are incurred primarily as a result of interest charges on bank debt held throughout the year and the associated borrowing rate. Bank debt is issued to fund intangible and capital asset purchases, prepayments of future expenses and working capital deficiencies due to timing differences in the collection of revenues and payment of expenses. Borrowing costs are also incurred through the amortization of right-of-use liabilities in accordance with IFRS 16.

Budgeted costs for 2024 are 30 per cent lower than the 2023 approved budget, reflecting a reduction in anticipated borrowing requirements resulting from reduced working capital deficiencies.

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

Intangible and capital assets are financed through the AESO's credit facilities and associated costs are recovered over the useful lives of the assets (included in amortization and depreciation) in accordance with IFRS. The useful lives are reviewed on an annual basis. Intangible assets include the AESO's computer software purchases and development. Amortization and depreciation is also incurred through the amortization of right-of-use assets in accordance with IFRS 16.

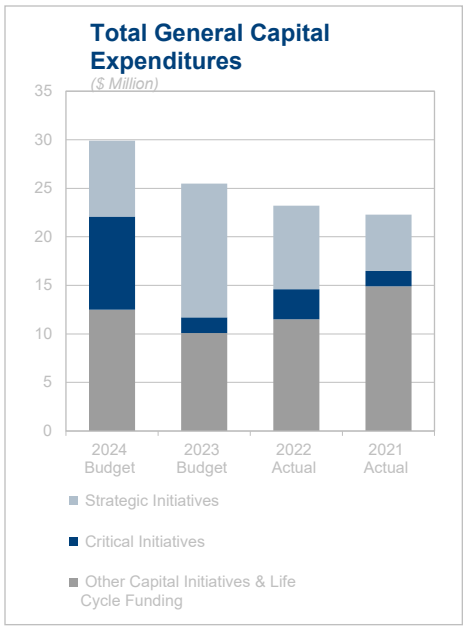
The 2024 budget is nine per cent higher than the 2023 approved budget, reflecting a higher depreciable asset base in 2024, consistent with the increased capital budget year-over-year.

Additional information on the AESO's 2024 capital projects is provided in the following section.

Section III – Capital Costs

2024 Budget

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.



Strategic Related Initiatives – Includes projects that must be completed within the timeframe identified.

Critical Initiatives – Includes the most critical projects, which must be initiated in 2024, but there is then flexibility on how they are paced. They are more internal AESO operational, business and/or security related**.**

Other Capital Initiatives & Life Cycle Funding – Other business projects and leasehold improvements that may have more flexibility in terms of timing for planning and delivery. Included in this category are hardware replacements (end of useful life) and recurring software upgrades that have required cyclical timing for updating or replacement.

Special Capital – Major projects that are over $10 million and have obtained specific Board approval. These tend to be non-typical capital projects that are not part of operational initiatives or life cycle programs.

Capital programs initiated by the AESO are reviewed and approved through a portfolio management process. Capital programs are reviewed on an ongoing basis to ensure appropriate prioritization, assess progress and budget spending, and to identify potential issues. Any new or modified requirements are reviewed and prioritized to determine how they align with existing work; part of a continual process to ensure alignment of priorities and business needs.

The following table identifies a preliminary list of programs that are planned for 2024 based on current operations and the business initiatives.

Capital Expenditures

($ million)

	2024 Budget	2023 Approved Budget[15]	$ Variance	% Variance	2022 Actual	2021 Actual
Strategic Related Initiatives	**7.8**	**13.8**	(6.0)	(43)	8.6	5.8
Enabling Transformation	4.8	6.1	(1.3)	(21)	0.5	0.3
EMS Sustainment	2.9	7.7	(4.8)	(62)	8.1	5.5
Critical Initiatives	**9.6**	1.6	8.0	500	3.1	1.6
Business System Modernization	0.4	0.2	0.2	100	1.4	0.8
Security & Compliance	1.3	1.4	(0.1)	(7)	1.7	0.8
Critical Systems Modernization & User Device Refresh	7.9	-	7.9	-	-	-
Other Capital Initiatives & Life Cycle Funding	**12.5**	10.1	2.4	24	11.5	14.9
Total General Capital	**29.9**	25.6	4.3	17	23.2	22.4
Special Capital	**18.0**	-	18.0	-	-	-
Total Capital	**47.9**	25.6	22.3	87	23.2	22.4

Differences are due to rounding

A detailed review of the capital requirements for 2024 takes into consideration the progress that has been made on the inflight projects that are multi-year in nature, the new requirements for 2024 and the AESO's capacity to design and implement system solutions. Based on these findings, the proposed capital budget for 2024 is $47.9 million, which is $22.3 million or 87 per cent higher than the 2023 approved budget of $25.6 million. This increase is largely attributable to the $18.0 million downtown relocation project, a special capital project that has obtained specific Board approval and coincides with the end of the AESO's current downtown leases. Also of note are increases related to critical initiative projects, such as the $7.9 million increase for the critical systems modernization and user device refresh category. These increases are offset by a decrease of $4.8 million related to the EMS sustainment project as it nears completion.

[15] Amounts are from the 2023 BDP.

Section IV – Revenue

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

Transmission

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

Energy Market

The AESO recovers the costs of operating the real-time energy market through an energy market trading charge on all megawatt hours traded. In accordance with the EUA, these costs may also include expenses of other related powers, duties, responsibilities and functions of the AESO.

Based on the 2024 budget and a current trading volume forecast, an energy market trading charge of 33.2¢ per MWh traded is proposed to recover the AESO's budgeted costs for 2024. The trading charge for 2024 is higher than 2023, reflecting the continuity of a refund of overcollection from previous years being more than offset by the increase in the 2024 general and administrative budget and related allocation to the energy market.

The AESO costs are 29.6¢ per MWh traded, representing an increase of 4.0¢ per MWh traded or 16 per cent from the 2023 rate of 25.6¢ per MWh traded.

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

Trading Charge (¢ per MWh)

	2024	2023	2022	2021	2020	2019
AESO Costs	**29.6**	25.6	23.0	28.5	29.8	34.7
Energy Market Shortfall / (Surplus)	**(3.3)**	(1.8)	(2.8)	1.2	6.6	3.0
AESO Component	**26.3**	23.8	20.2	29.7	36.4	37.7
AUC's Portion of Energy Market Administration Fee	**6.9**	6.3	6.3	5.4	6.2	4.8
Total	**33.2**	30.1	26.5	35.1	42.6	42.5

Differences are due to rounding

Trading Charge Recoverable Amounts ($ million)

	2024	2023	2022	2021	2020	2019
AESO Costs	**35.7**	31.9	28.5	34.3	40.0	46.8
Energy Market Shortfall / (Surplus)	**(4.0)**	(2.3)	(3.5)	1.5	8.9	4.0
AESO Component	**31.7**	29.7	25.0	35.8	48.9	50.8
AUC's Portion of Energy Market Administration Fee	**8.4**	7.8	7.9	6.6	8.3	6.5
Total	**40.0**	37.5	32.9	42.4	57.2	57.3

Differences are due to rounding

Renewables

The AESO is responsible for administering the REP and recovering the costs through fees charged to generators that receive renewable energy credits. Any cumulative shortfalls of revenue over costs will be recovered at the conclusion of the program.

Load Settlement

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

Appendix A: 2023 Updated Forecast vs 2023 Budget Review Process (BRP)

Transmission Operating Costs

($ million)

	2023 Updated Forecast	2023 Approved Forecast[16]	$ Variance	% Variance
Wires Costs	**1,899.5**	1,918.3	(18.8)	(1)
Transmission Line Losses	**327.9**	183.8	144.1	78
Operating Reserves	**488.5**	265.5	223.0	84
Other Ancillary Services Costs	**38.6**	37.5	1.1	3
Transmission Operating Costs	**2,754.5**	**2,405.1**	**349.4**	**15**

Differences are due to rounding

Wires Costs

The 2023 updated forecast for wires costs is one per cent lower than the 2023 approved forecast based on the amounts paid primarily to the TFOs in accordance with their AUC-approved tariffs.

The 2023 updated forecast is based on TFO tariffs approved or applied-for as of August 2023 with the majority of the updated forecast reflecting: i) filed 2023 tariffs; ii) filed 2023 negotiated settlements; or iii) AUC approvals for 2023 tariffs.

Transmission Line Losses

Transmission line losses costs in the 2023 updated forecast are 78 per cent higher than the 2023 approved forecast. The increase is primarily due to a 69 per cent increase in the 2023 updated forecast of average pool price of $159 per MWh compared to the 2023 approved forecast pool price of $94 per MWh. The increase in average pool price is driven by a multitude of factors, including offer behavior, coupled with scarcity prices, the delayed commissioning of some thermal assets, and an increase in operating costs due to carbon compliance and higher interest rates.

The 2023 updated forecast of transmission line losses volumes is 2,105 gigawatt hours, which is 10 per cent higher than the 2023 approved forecast of 1,906 gigawatt hours and is primarily driven by higher actual losses volumes in the first half of 2023. In addition, increased exports, congestion and constraints in certain areas, as well as wildfires in Alberta have led to increased losses.

Operating Reserves

Operating reserves costs in the 2023 updated forecast are 84 per cent higher than the 2023 approved forecast. This increase is primarily due to a 69 per cent increase in the 2023 updated forecast of average pool price of $159 per MWh compared to the 2023 approved forecast pool price of $94 per MWh. Additionally, in order to mitigate reliability concerns associated with intermittent generation, there has been

[16] Amounts are from the 2023 BDP.

a significant volumetric increase in regulating reserves standby activations, and the AESO intends to procure more active regulating reserves in the latter part of 2023 and into 2024.

The 2023 updated forecast of operating reserves volumes is 6.5 terawatt hours, which is four per cent lower than the 2023 forecast of 6.8 terawatt hours.

Other Ancillary Services Costs

The 2023 updated forecast for Other Ancillary Services Costs is consistent with the 2023 approved forecast.

Other Industry Costs

($ million)

	2023 Updated Forecast	2023 Approved Forecast[17]	$ Variance	% Variance
AUC Fees – Transmission	**10.2**	10.2	-	-
AUC Fees – Energy Market	**7.5**	7.8	(0.3)	(4)
WECC/NWPP/NERC Fees	**2.8**	2.7	0.1	4
Regulatory Process Costs	**2.1**	4.3	(2.2)	(51)
Other Industry Costs	**22.6**	**25.0**	**(2.4)**	**(10)**

Differences are due to rounding

The 2023 updated forecast for other industry costs is 10 per cent lower than the 2023 approved forecast. The decrease is primarily due to Regulatory Process Costs resulting from a reduction in unforeseen tariff proceedings costs compared to those forecasted.

General and Administrative Costs

($ million)

	2023 Forecast	2023 Approved Budget[18]	$ Variance	% Variance
Staff Costs	**78.0**	80.6	(2.6)	(3)
Contract Services and Consultants	**4.8**	5.6	(0.8)	(14)
Administration	**5.1**	5.3	(0.2)	(4)
Facilities	**4.8**	4.6	0.2	4
Computer Services and Maintenance	**10.9**	10.9	-	-
Telecommunications	**1.3**	1.4	(0.1)	(7)
General and Administrative Costs	**104.9**	**108.3**	**(3.4)**	**(3)**

Differences are due to rounding

[17] Amounts are from the 2023 BDP.
[18] Amounts are from the 2023 BDP.

Staff costs for 2023 are forecast to be 3 per cent lower than the 2023 BRP approved budget primarily due to the impact of delays in planned hires and unanticipated vacancies more than offsetting increased benefits costs.

Contract services and consultants costs for 2023 are forecast to be 14 per cent lower than the 2023 approved budget primarily due to the timing and reprioritization of initiatives requiring external legal and consulting services.

Forecasted costs for 2023 for all other general and administrative cost categories above do not vary significantly from the 2023 approved budget.

Borrowing Costs and Amortization and Depreciation

($ million)

	2023 Forecast	2023 Approved Budget[19]	$ Variance	% Variance
Borrowing Costs	**0.8**	**1.0**	**(0.2)**	**(20)**
Amortization and Depreciation	**22.8**	**23.3**	**(0.5)**	**(2)**

Differences are due to rounding

Borrowing Costs

Borrowing costs for 2023 are forecast to be 20 per cent lower than the 2023 approved budget due to a reduction in borrowing requirements resulting from a surplus in working capital.

Amortization and Depreciation

Amortization and depreciation costs for 2023 are forecast to be two per cent lower than the 2023 approved budget. This decrease is due to a lower depreciable asset base than anticipated, resulting from variations in the timing of assets being completed and placed into service.

[19] Amounts are from the 2023 BDP.

Capital Costs

($ million)

	2023 Forecast	2023 Approved Budget[20]	$ Variance	% Variance
Strategic Related Initiatives	**11.5**	**13.8**	(2.3)	(17)
Critical Initiatives	**1.2**	**1.7**	(0.5)	(29)
Other Capital Initiatives & Life Cycle	**11.4**	**10.1**	1.3	13
Total Capital	**24.1**	**25.6**	(1.5)	(6)

Differences are due to rounding

The variance between the 2023 forecast and the 2023 approved capital budget is a net decrease of $1.5 million or 6 per cent from $25.6 million to $24.1 million. This variance is mainly attributable to efforts to manage costs and defer where possible.

[20] Amounts are from the 2023 BDP.

Appendix B: Transmission Operating Cost Definitions

2024 Pool Price Forecast Methodology

Consistent with previous Budget Development Processes (BDPs), the AESO used EDC Associates' hourly pool price forecast for 2024. The hourly pool prices were taken from the seed that had an average annual price closest to the EDC summary monthly price. The hourly pool price forecast is used as an input to calculate the ancillary services and transmission line losses costs.

There are numerous variables and assumptions used in the hourly pool price forecast and it is noted that recent market fundamentals, such as those below, have been considered by EDC:

- The impact of carbon pricing and interest rates
- Pricing impacts associated with mothballs, retirements and conversion of coal assets
- Generation and transmission outages
- Natural gas prices
- Thermal assets and renewables additions in 2024

Transmission Line Losses

Transmission line losses represent the volume of energy that is lost as a result of electrical resistance on the transmission system. 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 statistical models that use variables such as economic inputs, weather, and seasonal effects to forecast hourly losses volumes.

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

Ancillary Services

Ancillary services are procured by the AESO to ensure reliability of the 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. In circumstances where procurement may not be feasible, other ancillary services may be secured through bilateral negotiations.

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.

Categories of Operating Reserves

Active operating reserves:

- Required to automatically balance small changes in supply and demand
- Required to maintain system reliability during unplanned events such as the loss of a generator, loss of a transmission line, or a sudden increase in demand
- Alberta Reliability Standards (ARS) define the minimum levels that must be procured
- Costs are the product of volumes procured multiplied by operating reserve price, which is indexed to the hourly pool price
- Represents approximately 90 per cent of total operating reserves costs
- Costs are impacted by pool price fluctuations, supply of offered reserves and market participant offer behavior

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 to provide energy
- Represents approximately 10 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

Load shed service (LSS) 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). LSS is also utilized to restore the Most Severe Single Contingency (MSSC) limit while the AIES is weakly connected or islanded from the rest of the Western Interconnection.

Fast Frequency Response (FFR) service is based on LSS, but has been adapted for new technology, such as energy storage.

The voluntary load curtailment (VLCP) program supports system reliability by providing voluntary curtailable load during periods of energy emergency alerts.

Transferred frequency response is a product which helps to satisfy the AESO's frequency response obligation within the WECC.

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 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. In 2022 the AESO ran a competitive procurement for a TMR contract within the area known as the Grande Prairie Loop. The successful proponent entered into a TMR contract which commenced in July 2022.

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 (TCR) 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 TCR payment for energy provided for that purpose. TCR came into effect on November 26, 2015.

Appendix C: Allocation of Costs

Management reviews allocation percentages on an ongoing basis and adjusts accordingly throughout the year.

Cost Type	Allocation Methodology
Direct Operating	Individual department input/analysis for current year work focus
Shared Services – Corporate Services[21]	Individual department input/analysis for current year work focus, as well as 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

[21] Corporate Services includes departments such as: Accounting, Settlement and Credit, People & Culture, Corporate Communications, Legal, etc.

Appendix D: Budget Amendments

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

Results of Forecast	Related Budget Process
If the forecast is below or in line with the previously approved budget amount	At management's discretion, any under-budget amounts will be used to advance future year business priorities or will be accumulated in the deferral accounts
If the forecast is above the previously approved budget amount and the amount is determined to be a 'manageable variance'	Management would request approval from the AESO Board and would subsequently issue a stakeholder communication
If the forecast is above the previously approved budgeted amount and the amount is in excess of a 'manageable variance'	Management will review the new funding requirements with stakeholders, followed by a request for approval from the AESO Board
A '**manageable variance**' is a forecast to actual variance that would be: • Less than 10 per cent of budgeted general and administrative expenditures • Less than 20 per cent of budgeted capital	

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