

AESO 2023 Business Plan and Budget Proposal



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Table of Contents

Executive Summary.....	3
Background	4
Strategic Focus	6
Financial Highlights.....	9
Appendix A: 2022 Updated Forecast vs 2022 BRP	25
Appendix B: Transmission Operating Cost Definitions.....	29
Appendix C: Allocation of Costs.....	32
Appendix D: Budget Amendments	33

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Executive Summary

The AESO's *2023 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 2023, 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 now impacting the electricity sector. Shifting generation technologies, distributed resources, changing consumer preferences and optionality expectations are driving this transformation. 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 required to consult on its budget as per the Transmission Regulation, and the process originally developed for this has been in place for a number of years. Following feedback received on the 2022 Budget Review Process (BRP), and the results of an internal review, the Executive felt there would be benefit to both stakeholders and the AESO if the existing budget review process was restructured. As a result, the AESO implemented a revised consultation process for the 2023 budget—the Budget Development Process (BDP)—that will replace the former BRP.

The most significant change in the new BDP is the addition of strategically focused consultations that take place well in advance of the budget development cycle. Specifically, senior executive stakeholders met 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, these sessions occurred June 1-3, 2022, where the majority of stakeholders outlined four themes of strategic importance that strongly aligned with the AESO's [2022 Strategic Plan](#) and recognized 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 2023.

The AESO is committed to playing a leadership role in enabling the transformation of the electricity industry while maintaining system reliability, acting in the public's interest, and providing information and analysis to policymakers and stakeholders. Alberta's electricity industry is undergoing significant change, and the pace of this change is accelerating. Transitioning to a decarbonized grid, coupled with a growing volume of project connections, creates a highly complex environment characterized by significantly increased workloads and complexity of projects. The AESO recognizes this increasing complexity and rapidly growing volume of connection projects are outpacing its resources. It further recognizes that this critical work requires resource expertise and significant industry collaboration, and that this work must be done in a timely manner. The AESO has determined that it must therefore retain, develop and attract resource expertise and increase its funding requirements in order to be effective. A lack of proper execution and planning today could have far-reaching cost and reliability impacts on Alberta's power system in the future.

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" will be its key focus in 2023 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 reliable, 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, priorities and pace 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 2023 budget.

Table: Summary of the Aggregated Forecast and Budgeted Costs for 2023

(\$million)

	2023 Forecast/ Budget	2022 Forecast/ Budget ¹	\$ Variance	% Variance
Transmission Operating Costs	2,405.1	2,250.1	155.0	7
Other Industry Costs	25.0	24.1	0.9	4
General and Administrative	109.1	95.7	13.4	14
Borrowing Costs	1.0	2.8	(1.8)	(64)
Amortization and Depreciation	23.3	24.6	(1.3)	(5)
Capital Expenditures	25.6	25.3	0.3	1

Differences are due to rounding

Background

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 revised approach provides greater opportunities for the AESO to gain stakeholder insight on areas of focus earlier in the process. 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.

The previous BRP created challenges for stakeholders as it set an expectation that the AESO would make substantial alterations to its budget, specifically as it related to staff costs, in response to stakeholder feedback provided during the process. The revised approach facilitates a more meaningful exchange with stakeholders as it enabled an opportunity for stakeholders to influence the type, timing and priority of work the AESO undertakes. Stakeholder insights on these matters then assisted the AESO with the allocation of its staff resources and the determination of consulting and capital expenses.

Below are the four strategic areas (themes of strategic importance), outlined by stakeholders at the June 1-3 meetings with the AESO Board:

Net-zero -- With Alberta’s power sector undergoing significant change driven by new technologies, carbon policy, broad electrification and a societal desire for cleaner forms of energy, stakeholders believe the net-zero work is the most critical and most challenging work the AESO will undertake over the next decade.

¹ Amounts are from the 2022 BRP

Stakeholders underscored the importance of the leadership role of the AESO in providing guidance and analysis to both industry and the provincial and federal governments, where possible, on the potential net-zero emissions pathways for Alberta's electricity sector. Stakeholders identified the critical role the AESO will play in the reliability of the system and proper functioning of the market during the net-zero transition.

Cost of delivered energy -- Stakeholders are concerned about the rising costs of delivered energy and believe collaboration is needed to develop meaningful solutions for both large and small consumers. Stakeholders see this as an important focus area and believe the AESO is the right conduit to facilitate this work to balance polarized interests while ensuring reliable, affordable power is always available to Albertans.

Reliability implications and impacts of our changing system -- Stakeholders are concerned about the ongoing reliability of the power system through the transformation, including whether the AESO and industry are doing enough to ensure grid resiliency, and whether there is a robust enough understanding of the challenges posed by a transition of the generation fleet. Stakeholders emphasized that the AESO needs to continue its focus on grid resiliency and reliability, ensuring it has a strong understanding of the risks, challenges and implications to the changing system, and the desire for the AESO to work closely with industry to ensure we are collectively reinforcing "the reliability" of the system through this transformation.

Market sustainability -- Generators are concerned with the sustainability of the market going forward with the influx of renewables in addition to the potential pathways to net-zero. Each had a slightly different viewpoint of what may work to maintain a well-functioning market, but ultimately see it as a top priority for the AESO to ensure it is fostering market fidelity and investor confidence through the transformation.

Stakeholders conveyed their understanding of the current pressures on AESO resources and the volume and pace of challenges ahead and stressed the importance of the AESO being staffed appropriately to effectively deliver on its mandate. These themes strongly align with the AESO's 2022 Strategic Plan and recognize the integrated challenges it faces as the power system transforms. The AESO considered the stakeholders' thoughtful observations, ideas and expertise to identify its corporate focus areas and associated priorities for 2023 and beyond.

The Complexity of Transformation

Connection projects have become significantly more complex to integrate into the power system due in part to new challenges associated with variable generation and inverter-based technologies, the volume of connections occurring at any specific time and the growth in project sizing. This results in longer connection timelines, more effort per project to manage, and management of an overall increase in volume of projects. Project requirements are outpacing AESO resources, and the backlog of AESO deliverables continues to grow resulting in longer execution times. Furthermore, the system complexity is growing with an increase in generation projects in resource rich areas adding more complexity in studying and processing applications, with increased congestion with Remedial Action Scheme (RAS), and coordination with system planning required for orderly development.

The discipline of power system engineering is shifting, and the AESO needs additional skillsets to plan for and operate the system due to increased complexity and the need for understanding of simulations related to the frequency domain. System planning and operations, market design, forecasting and analysis, connection processes, internal systems and stakeholder communications must all align to create a path forward and ensure we have the price signals, technical requirements and products needed to sustain system reliability as the generation fleet and the industry more broadly transform.

Strategic Focus

The AESO's [2022 Strategic Plan](#) and the corresponding alignment with the identified stakeholder themes of strategic importance and concerns is as follows:

Table: Alignment of Stakeholder Themes of Strategic Importance with 2022 Strategic Plan

		AESO 2022 Strategic Plan							
		Future of Electricity - Strategic Focus Areas			Strengthening Today's Core Business Functions				
AESO Mandate	What We Heard	Energizing People and Culture	Delivering Value Through Grid Optimization	Enabling Transformation	Markets and Competition	Grid Resiliency	Data and Digitalization	External Engagement	
Within	Stakeholder Themes of Strategic Importance	Net-Zero	x	x	x	x	x		x
		Cost of Delivered Energy		x	x	x			
		Reliability and Resiliency			x		x		
		Market Sustainability			x	x			
	Stakeholder Concerns	Staffing Requirements	x		x				
		Connection Process Efficiencies	x	x	x				x
Outside	Limited New Policy Implementation			x	x			x	
	Regulatory Uncertainty			x	x			x	

2022 Strategic Plan: Enabling Transformation

The transformation of the province's electricity system will support economic growth and help shape Alberta's future. We play a leadership role in enabling this transformation while maintaining system reliability, acting in the public's interest, and providing guidance to policymakers and industry.

Strategic Actions

- Ensure our framework can enable electrification and is flexible and adaptable to integrate technological change on a level playing field
- Proactively provide information and insights to government at both the provincial and federal level regarding policies that impact the electricity sector, with a focus on carbon policy
- Continue to assess system reliability needs and proactively identify and implement required changes.
- Complete modernization of the tariff to ensure appropriate price signals for use of the transmission system, enable optionality without undue cross-subsidization and reduce barriers to entry

Outcomes

- We provide a fair and balanced framework that ensures customers have optionality without shifting costs to other consumers
- We implement policy changes in a manner that sustains or enhances reliability and the functioning of a competitive market
- We have the price signals, technical requirements and products needed to sustain system reliability as the generation fleet and the industry more broadly transform

The table below contains AESO priorities identified for 2023. Although Enabling Transformation will be the AESO’s prominent focus area for 2023, the AESO will continue to progress the other strategic focus areas and core business functions as per the Strategic Plan

Table: 2023 Priorities

Priorities to Enable Transformation in 2023		What We Heard					
		Stakeholder Themes of Strategic Importance				Stakeholder Concerns	
		Net-Zero	Cost of Delivered Energy	Reliability and Resiliency	Market Sustainability	Staffing Requirements	Connection Process
1	Assess specific implications of carbon policy implementation mechanisms on the electricity sector to provide insights to government and industry	x	x	x	x	x	
2	Identify required market initiatives to support long-term sustainability and competitiveness of the energy-only market structure, based on output from carbon policy analysis and assessments	x	x	x	x		
3	Assess different fleet scenarios (from carbon policy analysis), and options to implement (technical requirements, market design changes and new ancillary service products)	x	x	x		x	
4	Implement Energy Storage (ES) and Distributed Energy Resources (DER) integration	x	x	x	x		
5	Streamline the connection process		x			x	x
6	Ensure staffing requirements can effectively deliver the AESO’s priorities to enable transformation	x				x	x
7	Manage costs and effectively implement policies		x				

In order to enable the transformation, the AESO staff will be prioritizing and making strategic shifts for 2023 on how they deliver on the AESO’s mandate, such as:

- Evaluating the Long-Term Plan and Long-Term Outlook products to determine an appropriate scope that delivers value to our stakeholder and meets our regulatory obligations, with the objective of improving efficiency and agility
- Evaluating the AESOs 2023 Tx/Dx and DER workplans and prioritizing actions based on criticality and efficiency in resources
- Continued transformation work initiated in 2022
- Connection process streamlining

- Shifting focus from continuous improvement work in market design and tariff, to market sustainability in a Net-Zero transformation

The AESO strives to have a proactive approach and to work in a coordinated manner and limit regulatory burden as it navigates the challenges of enabling transformation and adapting as needed. The complexity and speed of transformation requires growth stage strategies in order to deliver on the AESO's priorities. The forthcoming section on Financial Highlights details the staffing cost increases determined to be required to deliver on these priorities.

As the AESO stewards the reliability of the grid and efficient market function on behalf of all Albertans, its success is dependent on its engagement with stakeholders. The AESO is committed to continuing to work in meaningful and productive ways with its stakeholders and to build upon the advancements made over the past several years.

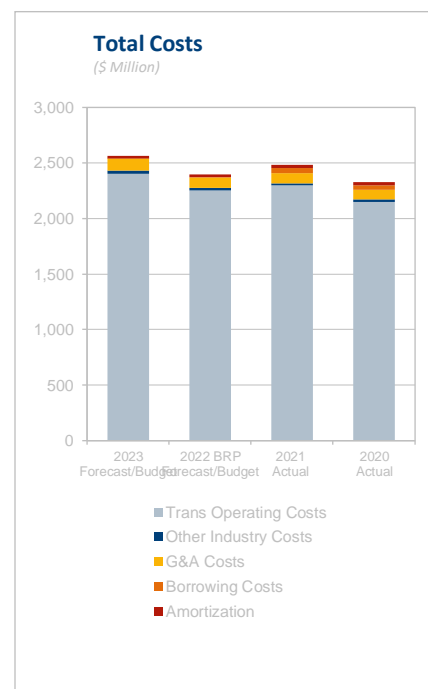
Financial Highlights

As part of this 2023 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)

	2023 Forecast/ Budget	2022 Forecast/ Budget ²	\$ Variance	% Variance	2021 Actual	2020 Actual
Transmission Operating Costs	2,405.1	2,250.1	155.0	7	2,296.6	2,147.3
Other Industry Costs	25.0	24.1	0.9	4	21.6	22.7
General and Administrative	109.1	95.7	13.4	14	91.8	88.1
Borrowing Costs ³	1.0	2.8	(1.8)	(64)	47.1	38.0
Amortization and Depreciation	23.3	24.6	(1.3)	(5)	28.1	30.7
Capital Expenditures	25.6	25.3	0.3	1	22.4	23.2

Differences are due to rounding

² Amounts are from the 2022 BRP. On June 30, 2022, the AESO Board approved an amendment to the 2022 G&A Budget, an increase of \$2.1 million, bringing the total approved G&A Budget for 2022 to \$97.8 million.

³ 2020 and 2021 Actual amounts include \$33.6 million and \$45.8 million, respectively, of interest costs related to Loss Factor resettlements, which were largely offset by interest revenues not presented here. Excluding these balances, 2020 and 2021 Actual amounts are \$4.4 million and \$1.3 million, respectively.

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)

	2023 Forecast	2022 Approved Forecast ⁴	\$ Variance	% Variance	2021 Actual	2020 Actual
Wires Costs	1,918.3	1,896.7	21.6	1	1,713.6	1,872.1
Transmission Line Losses	183.8	143.3	40.5	28	201.8	92.7
Operating Reserves	264.5	169.3	95.2	56	333.7	144.8
Other Ancillary Services Costs	38.5	40.8	(2.3)	(6)	47.5	37.7
Transmission Operating Costs	2,405.1	2,250.1	155.0	7	2,296.6	2,147.3

Differences are due to rounding

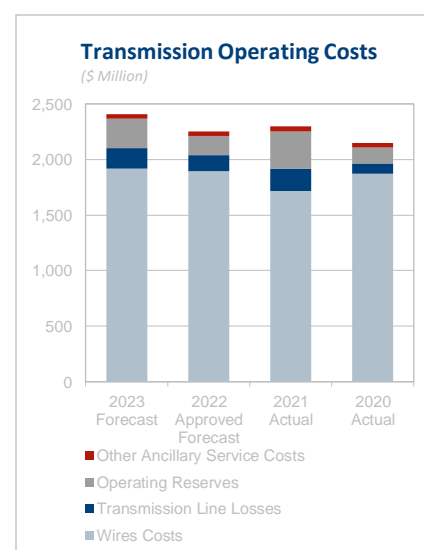
Additional information on the 2023 forecast methodology and descriptions of the cost categories is provided in Appendix B (Transmission Operating Cost Definitions).

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.

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

The 2023 forecast is based on TFO tariffs of \$1,917.9 million (2022 - \$1,895.0 million), which have been approved or applied-for as of August 2022 with a majority of the forecast reflecting: i) filed 2023 tariffs; ii) filed 2023 negotiated settlements; or iii) AUC approvals for 2022 and 2023 tariffs. The 2023 forecast also includes the AESO's forecast for LBC SO costs of \$0.4 million (2022 – \$1.7 million).



Transmission Line Losses

The 2023 forecast for transmission line losses is 28 per cent higher than the 2022 approved forecast. This increase is primarily attributable to an increase in the 2023 forecasted average pool price of \$94 per megawatt hour (MWh) which is 27 per cent higher than the 2022 forecast of \$74 per MWh. The higher pool prices anticipated for 2023 can be mainly attributed to the trends being seen year-to-date in 2022, being an increase in natural gas prices and the expensive operation of thermal units because of increasing carbon compliance costs that must be recovered through the market.

⁴ Amounts are from the 2022 BRP

The 2023 transmission line losses volumes forecast is 1,906 gigawatt hours, which is consistent with the 2022 forecast of 1,900 gigawatt hours.

Operating Reserves

The 2023 forecast for operating reserves costs is 56 per cent higher than the 2022 approved forecast. The cost of operating reserves is impacted by actual volumes, hourly pool prices, and operating reserve prices.

The 2023 operating reserves volumes forecast is 6.8 terawatt hours, which is consistent with the 2022 approved forecasted volumes.

The average pool price used for the 2023 forecast is \$94 per MWh, which is 27 per cent higher than the 2022 forecast of \$74 per MWh.

Contributing to higher operating reserve costs is the impact of the active operating reserves prices, which are the most significant operating reserve costs and are derived from pool price and a premium or discount to pool price. During periods of low pool prices, the discounts offered reflect the offer strategies associated with the lower pool prices, which are low or small discounts. In periods of higher pool prices, the discounts will typically increase to correspond with the higher pool prices. While the prices of operating reserves procured are indexed to the pool price, changes to the average pool price do not result in proportional changes to the operating reserve costs. The premiums and discounts used in the 2023 forecast are derived from the 2022 and 2021 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 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)

	2023 Forecast	2022 Approved Forecast ⁵	\$ Variance	% Variance	2021 Actual	2020 Actual
Load Shed Service for Imports (LSSi) and Fast Frequency Response (FFR)	26.6	29.4	(2.8)	(10)	31.4	28.3
Contracted Transmission Must-run (TMR)	2.3	-	2.3	-	-	3.0
Conscripted Services - Operating Reserves (OR) and Transmission Must-run (TMR)	3.0	5.0	(2.0)	(40)	8.1	0.7
Reliability Services	2.9	2.9	-	-	2.9	2.9
Black Start	2.7	2.5	0.2	8	2.4	2.3
Transmission Constraint Rebalancing (TCR)	1.0	1.0	-	-	2.7	0.5
Other Ancillary Services Costs	38.5	40.8	(2.3)	(6)	47.5	37.7

Differences are due to rounding

⁵ Amounts are from the 2022 BRP

The 2023 forecast for other ancillary services costs is 6 per cent lower than the 2022 approved forecast primarily due to the following:

LSSi and FFR costs for 2023 are forecast to be 10 per cent lower than the 2022 approved forecast and are based on the expected operations of the transmission system in 2023 and reflect contract pricing for LSSi and FFR services. The 2023 forecast considers historical availability levels and forecast import and arming volumes.

The 2023 forecast for contracted TMR includes cost estimates for the new TMR contract for the Grand Prairie Loop, which commenced in July 2022. As this contract was awarded in 2022, the related terms were unknown when the 2022 forecast was approved.

The 2023 forecast for conscripted OR and TMR services is 40 per cent lower than the 2022 approved forecast. This is primarily due to the TMR contract that commenced in July 2022, which will reduce the need for conscripted TMR services in the northwest region of Alberta.

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 Western Electricity Coordinating Council (WECC), Northwest Power Pool (NWPP) 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 directions or recommendations that are beyond the routine operations of the AESO. This does not include application preparation costs.

Other Industry Costs (\$ million)

	2023 Forecast	2022 Approved Forecast ⁶	\$ Variance	% Variance	2021 Actual	2020 Actual
AUC Fees – Transmission	10.2	10.3	(0.1)	(1)	9.7	10.8
AUC Fees – Energy Market	7.8	7.8	-	-	7.3	7.2
WECC/NWPP/NERC Fees ⁷	2.7	2.5	0.2	8	2.3	2.5
Regulatory Process Costs	4.3	3.5	0.8	23	2.3	2.2
Other Industry Costs	25.0	24.1	0.9	4	21.6	22.7

Differences are due to rounding

⁶ Amounts are from the 2022 BRP

⁷ Western Electricity Coordinating Council / Northwest Power Pool / North American Electric Reliability Corporation

AUC Fees

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

WECC/NWPP/NERC Fees

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

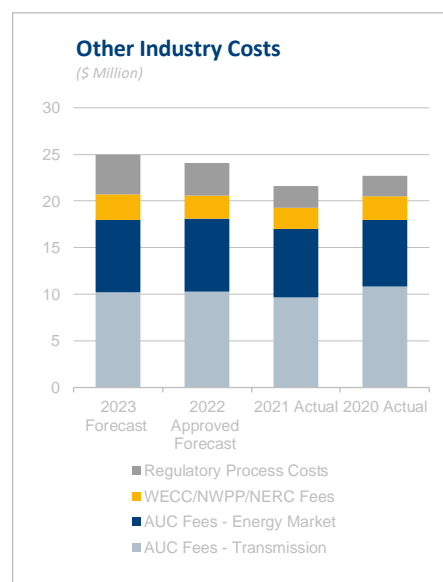
The AESO is also a member of the NWPP, which operates to achieve maximum benefits of coordinated operations for its member organizations. Participation in the NWPP allows the AESO to take advantage of their Reserve Sharing Group, thereby reducing Alberta’s reserve requirements at times.

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

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 2023 forecast for regulatory process costs is 23 per cent higher than the 2022 approved forecast primarily due to 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

2023 Budgets

The following table provides a summary of the general and administrative costs budgeted for 2023. 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 economic 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 while ensuring reliable, affordable power is always available to Albertans. The AESO 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

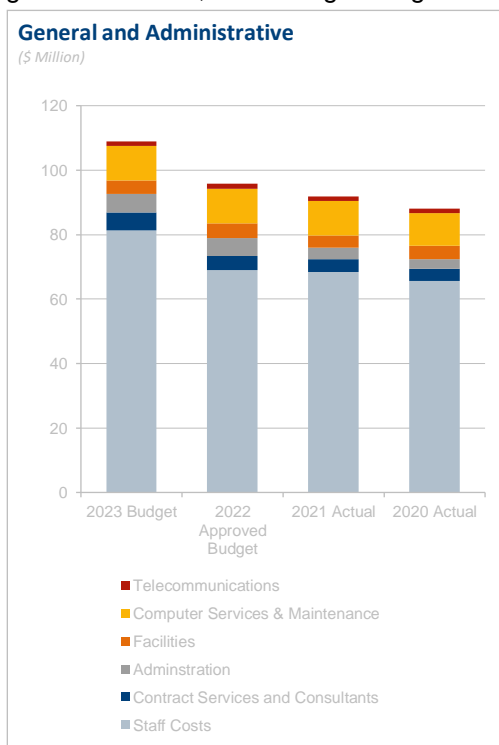
General and Administrative Costs (\$ million)

	2023 Budget	2022 Approved Budget ⁸	\$ Variance	% Variance	2021 Actual	2020 Actual
Staff Costs	81.3	68.9	12.4	18	68.3	65.7
Contract Services and Consultants	5.6	4.5	1.1	24	4.1	3.7
Administration	5.7	5.5	0.2	4	3.5	3.0
Facilities	4.1	4.5	(0.4)	(9)	3.9	4.1
Computer Services and Maintenance	10.9	10.9	-	-	10.6	10.2
Telecommunications	1.4	1.4	-	-	1.4	1.4
General and Administrative Costs	109.1	95.7	13.4	14	91.8	88.1

Differences are due to rounding

In 2022, the AESO's focus has been on optimizing the grid, enabling transformation, and strengthening our core business through grid resiliency and market function. The AESO's 2023 proposed general and administrative budget represents a 14 per cent increase from the 2022 approved budget and reflects the estimated growth in resources required 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.



⁸ Amounts are from the 2022 BRP. On June 30, 2022, the AESO Board approved an amendment to the 2022 G&A Budget, an increase of \$2.1 million for Staff Costs, bringing the total approved G&A Budget for 2022 to \$97.8 million.

Significant variances from the 2022 approved budget are as follows:

(\$ million)		
2022 Approved Budget		\$ 95.7
Staff Costs		
Impact of 2022 market adjustments to Staff Costs	4.5	
Resource needs	5.2	
2023 market adjustment to Staff Costs	2.8	12.4
Contract Services and Consultants		1.0
2023 Proposed Budget		\$ 109.1
Connection revenue offset – Staff Costs	(1.4)	
Connection revenue offset – Consultants	(0.5)	(1.9)
Net Cash Impact		\$ 107.2

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 pay-at-risk.

Budgeted staff costs for 2023 are 18 per cent higher than the 2022 approved budget. This increase reflects market adjustments for 2022 and proposed adjustments for 2023 of \$4.5 million and \$2.8 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 6 years. These market adjustments, along with a proposed \$5.2 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 focus areas in 2023.

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 2023 is 5 per cent, which also takes into consideration adjustments to employee compensation for inversions, compressions and promotions.

Short-term (annual) incentive plan – The AESO's short-term incentive plan (STIP) is based on an assessment of corporate and individual performance, as aligned to corporate objectives and key results. STIP targets were reduced in July 2022 with the introduction of the AESO's defined contribution pension plan.

Vacancy rate – The AESO has discontinued its practice of budgeting a vacancy rate for 2023 and will instead manage its staff costs in accordance with budgeted positions and an ongoing assessment of resource needs. AESO Management determined that given the current growth state of the electricity industry, a vacancy rate was not advantageous in managing its overall staff costs budget.

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, the overall costs are budgeted at 26 per cent, a slight increase over the 2022 budgeted costs of 21 per cent.

With proposed connection fee revenue in 2023 to help offset additional budgeted general and administrative costs to appropriately manage the growing connections queue, connection revenue offset of \$1.4 million has been budgeted for staff costs.

Contract Services and Consultants

Contract Services and Consultants (\$ million)

	2023 Budget	2022 Approved Budget ⁹	\$ Variance	% Variance	2021 Actual	2020 Actual
Consulting	4.3	3.4	0.9	26	3.2	3.0
Legal	1.2	1.0	0.2	20	0.8	0.6
Audit	0.1	0.1	-	-	0.1	0.1
Contract Services and Consultants	5.6	4.5	1.1	24	4.1	3.7

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 2023 are 24 per cent higher than the 2022 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 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.

⁹ Amounts are from the 2022 BRP

In 2023, \$1.0 million of contract services and consultants costs are budgeted to primarily support strategic initiatives. With proposed connection fee revenue in 2023 to help offset additional budgeted general and administrative costs to appropriately manage the growing connections queue, connection revenue offset of \$0.5 million has been budgeted for contract services and consultants costs.

Administration

Administration (\$ million)

	2023 Budget	2022 Approved Budget ¹⁰	\$ Variance	% Variance	2021 Actual	2020 Actual
Travel and Training	1.4	1.6	(0.2)	(13)	0.3	0.5
Insurance	1.8	1.5	0.3	20	1.1	0.7
AESO Board Fees	0.5	0.5	-	-	0.5	0.4
Other Administrative	2.0	1.9	0.1	5	1.6	1.4
Administration	5.7	5.5	0.2	4	3.5	3.0

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 2023 are 4 per cent higher than the 2022 approved budget. The increase is primarily associated with an increase in insurance premiums due to continued increasing pressure in the market.

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 Alberta Minister of Energy. While the number of Board members can vary from time to time, there can be no more than nine members, with their compensation based on a retainer fee and additional fees based on their Board committee involvement and time spent on corporate matters.

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

¹⁰ Amounts are from the 2022 BRP

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 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. 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 2023 are 9 per cent lower than the 2022 approved budget. The decrease is primarily associated with market driven operating costs observed in the first half of 2022.

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 model¹¹ for IT infrastructure operating support (e.g., network, database, and middleware platforms).

Budgeted costs for 2023 are consistent with the 2022 approved budget.

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 2023 are consistent with the 2022 approved budget.

¹¹ A managed service model is where the AESO transfers the day-to-day management and operations of a support function (not the strategic management) to a third-party provider. With this support approach the AESO is able to leverage available technical resources and tools to provide more effective support for its critical processes. The managed services approach facilitates resource efficiencies and improves reliability.

Borrowing Costs and Amortization and Depreciation

Borrowing Costs and Amortization and Depreciation (\$ million)

	2023 Budget	2022 Approved Budget ¹²	\$ Variance	% Variance	2021 Actual	2020 Actual
Borrowing Costs ¹³	1.0	2.8	(1.8)	(64)	47.1	38.0
Amortization and Depreciation	23.3	24.6	(1.3)	(5)	28.1	30.7

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 2023 are 64 per cent lower than the 2022 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 2023 budget is 5 per cent lower than the 2022 approved budget, reflecting a lower depreciable asset base in 2023 as significant assets will reach the end of their useful lives.

Additional information on the AESO's 2023 capital projects is provided in the following section.

¹² Amounts are from the 2022 BRP

¹³ 2020 and 2021 Actual amounts include \$33.6 million and \$45.8 million, respectively, of interest costs related to Loss Factor resettlements, which were largely offset by interest revenues not presented here. Excluding these balances, 2020 and 2021 Actual amounts are \$4.4 million and \$1.3 million, respectively.

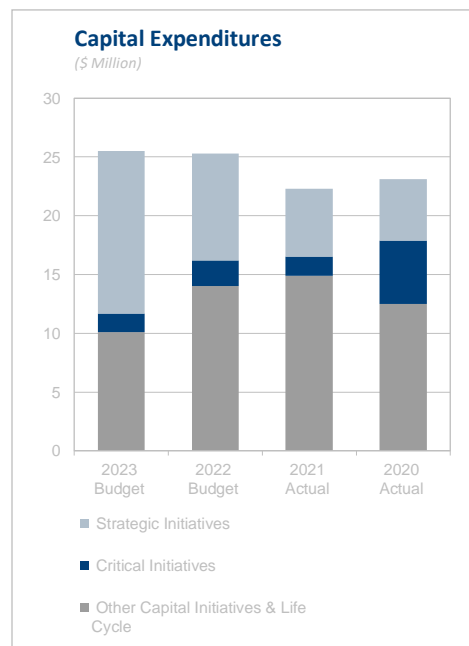
Section III – Capital Costs

2023 Budget

A detailed review of the capital requirements for 2023 takes into consideration the progress that has been made on the inflight projects that are multi-year in nature, the new requirements for 2023 and the AESO's capacity to design and implement system solutions. Based on these findings, the proposed capital budget is \$25.6 million for 2023 which is consistent with prior year (1 per cent or \$0.3 million increase), despite inflationary pressure.

The AESO considers the budgeting process for capital expenditures as the determination for the annual level of capital expenditures for use in an internal corporate capital management program process. Capital programs initiated by the AESO are reviewed and approved through this process. This process is led by senior management and facilitates a regular review and prioritization of programs to ensure business requirements are met and, at the same time, achieve the most beneficial and cost-effective results. This process also allows for the flexibility required to re-evaluate capital plans throughout the year.

The following table identifies a preliminary list of programs that are planned for 2023 based on current operations and the business initiatives. As time progresses across the identified planning period, requirements and circumstances may change and the portfolio management process will be used to manage these changes.



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. Capital programs are reviewed on an ongoing basis to assess progress and budget spending and identify potential issues. Any new or modified requirements are also reviewed and prioritized to determine how they align with existing work. This is a continual process to ensure alignment of priorities and business needs.

Strategic Related Initiatives – Strategic related initiatives must be completed within the timeframe identified.

Critical Initiatives – Most critical projects that must be completed within the timeframe identified – more internal AESO operational, business and, or security related.

Other Capital Initiatives & Life Cycle Funding – Other projects that have more flexibility in planning or delivery, so timing has more flexibility. Includes leasehold improvements, hardware replacements (end of useful life) and recurring software upgrades.

Capital Expenditures (\$ million)

	2023 Budget	2022 Approved Budget¹⁴	\$ Variance	% Variance	2021 Actual	2020 Actual
Strategic Related Initiatives	13.8	9.1	4.7	52	5.8	5.2
Enabling Transformation	6.1	0.9	5.2	578	0.3	0.2
EMS Sustainment	7.7	8.2	(0.5)	(6)	5.5	5.0
Critical Initiatives	1.6	2.2	(0.6)	(27)	1.6	5.4
Business System Modernization	0.2	0.8	(0.6)	(75)	0.8	-
Cyber Security & Critical Infrastructure Protection	1.4	1.4	-	-	0.8	1.3
Productivity & Critical Systems Interface Modernization	-	-	-	-	-	4.1
Other Capital Initiatives & Life Cycle	10.1	14.0	(3.9)	(28)	14.9	12.5
Total Capital	25.6	25.3	0.3	1	22.4	23.2

Differences are due to rounding

¹⁴ Amounts are from the 2022 BRP

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 administration and load settlement to maximize benefits under the *Electric Utilities Act* (EUA). This integration results in cost allocations in many parts of the organization for the purpose of cost recovery. In determining the revenue requirement on a function-by-function basis, all AESO costs are assigned or allocated to one of the four functions. Additional information on the cost allocation methodology is provided in Appendix 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.

Additionally, and new in 2023, is proposed connection fee revenue of \$1.9 million to help offset additional budgeted general and administrative costs to appropriately manage the growing connections queue. While the proposed connection fee revenue process will not be implemented until 2023 and therefore continues to evolve, it is anticipated that this revenue will serve to reduce the amount of transmission revenue to be collected via the AESO’s tariff rates.

Energy Market

The AESO recovers the costs of operating the real-time energy market through an energy market trading charge on all megawatt hours traded. Based on the 2023 budget and a current trading volume forecast, an energy market trading charge of 30.1¢ per MWh traded is proposed to recover the AESO’s budgeted costs for 2023. The trading charge for 2023 is higher than 2022, reflecting the continuity of a refund of overcollection from 2021 being more than offset by the increase in the 2023 general and administrative budget and related allocation to the energy market.

The AESO costs are 25.6¢ per MWh traded, representing an increase of 2.6¢ per MWh traded or 11 per cent from the 2022 rate of 23.0¢ 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)

	2023	2022	2021	2020	2019	2018
AESO Costs	25.6	23.0	28.5	29.8	34.7	23.7
Energy Market Shortfall / (Surplus)	(1.8)	(2.8)	1.2	6.6	3.0	(5.5)
AESO Component	23.8	20.2	29.7	36.4	37.7	18.2
AUC’s Portion of Energy Market Administration Fee	6.3	6.3	5.4	6.2	4.8	3.2
Total	30.1	26.5	35.1	42.6	42.5	21.4

Differences are due to rounding

Trading Charge Recoverable Amounts (\$ million)

	2023	2022	2021	2020	2019	2018
AESO Costs	31.9	28.5	34.3	40.0	46.8	30.4
Energy Market Shortfall / (Surplus)	(2.3)	(3.5)	1.5	8.9	4.0	(7.0)
AESO Component	29.7	25.0	35.8	48.9	50.8	23.4
AUC's Portion of Energy Market Administration Fee	7.8	7.9	6.6	8.3	6.5	6.5
Total	37.5	32.9	42.4	57.2	57.3	29.9

Differences are due to rounding

Renewables

The AESO is responsible for administering the Renewable Electricity Program (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: 2022 Updated Forecast vs 2022 BRP

Transmission Operating Costs

(\$ million)

	2022 Updated Forecast	2022 Approved Forecast ¹⁵	\$ Variance	% Variance
Wires Costs	1,927.0	1,896.7	30.3	2
Transmission Line Losses	227.4	143.3	84.1	59
Operating Reserves	307.8	169.3	138.5	82
Other Ancillary Services Costs	41.1	40.8	0.3	1
Transmission Operating Costs	2,503.3	2,250.1	253.2	11

Differences are due to rounding

Wires Costs

The 2022 updated forecast for wires costs is 2 per cent higher than the 2022 approved forecast based on the amounts paid primarily to the TFOs in accordance with their AUC-approved tariffs.

The 2022 updated forecast is based on TFO tariffs approved or applied-for as of August 2022 with the majority of the updated forecast reflecting: i) filed 2022 tariffs; ii) filed 2022 negotiated settlements; or iii) AUC approvals for 2022 tariffs.

Transmission Line Losses

Transmission line losses costs in the 2022 updated forecast are 59 per cent higher than the 2022 approved forecast. The increase is primarily due to a 58 percent increase in the 2022 updated forecast of average pool price of \$117 per MWh compared to the 2022 approved forecast pool price of \$74 per MWh, which is driven by higher than forecast natural gas prices, as well as high import volumes and the impact of planned outages of the Alberta-British Columbia intertie.

The 2022 updated forecast of transmission line losses volumes is 1,935 gigawatt hours, which is 2 per cent higher than the 2022 approved forecast of 1,900 gigawatt hours and is driven by higher actual losses volumes in the first half of 2022.

Operating Reserves

Operating reserves costs in the 2022 updated forecast are 82 per cent higher than the 2022 approved forecast. This increase is primarily due to a 58 percent increase in the 2022 updated forecast of average pool price of \$117 per MWh compared to the 2022 approved forecast pool price of \$74 per MWh.

The 2022 updated forecast of operating reserves volumes is 6.7 terawatt hours, which is 1 per cent lower than the 2022 forecast of 6.8 terawatt hours.

¹⁵ Amounts are from the 2022 BRP

Other Ancillary Services Costs

The 2022 updated forecast for Other Ancillary Services Costs is consistent with the 2022 approved forecast.

Other Industry Costs

(\$ million)

	2022 Updated Forecast	2022 Approved Forecast ¹⁶	\$ Variance	% Variance
AUC Fees – Transmission	8.9	10.3	(1.4)	(14)
AUC Fees – Energy Market	6.8	7.8	(1.0)	(13)
WECC/NWPP/NERC Fees ¹⁷	2.4	2.5	(0.1)	(4)
Regulatory Process Costs	6.4	3.5	2.9	83
Other Industry Costs	24.5	24.1	0.4	2

Differences are due to rounding

The 2022 updated forecast other industry costs is 2 per cent higher than the 2022 approved forecast. The slight overall increase is due to a decrease in AUC Fees and other industry-related membership fees being more than offset by an increase in Regulatory Process Costs resulting from unforeseen tariff proceedings costs over and above those forecasted.

General and Administrative Costs

(\$ million)

	2022 Forecast	2022 Approved Budget ¹⁸	\$ Variance	% Variance
Staff Costs	71.9	68.9	3.0	4
Contract Services and Consultants	4.2	4.5	(0.3)	(7)
Administration	4.5	5.5	(1.0)	(18)
Facilities	4.3	4.5	(0.2)	(4)
Computer Services and Maintenance	10.6	10.9	(0.3)	(3)
Telecommunications	1.4	1.4	-	-
General and Administrative Costs	96.9	95.7	1.2	1

Differences are due to rounding

¹⁶ Amounts are from the 2022 BRP

¹⁷ Western Electricity Coordinating Council / Northwest Power Pool / North American Electric Reliability Corporation

¹⁸ Amounts are from the 2022 BRP. On June 30, 2022, the AESO Board approved an amendment to the 2022 G&A Budget, an increase of \$2.1 million, bringing the total approved G&A Budget for 2022 to \$97.8 million.

Staff costs for 2022 are forecast to be 4 per cent higher than the 2022 BRP approved budget primarily due to the lifting of the Government of Alberta’s salary restraint in July 2022, allowing for market adjustments to salaries in the second half of the year. Additionally, the implementation of the AESO’s defined contribution pension plan and a change in methodology related to the recognition of vacation accruals have added to the increased forecasted costs. In June 2022, the AESO Board approved a \$2.1 million amendment to the BRP approved budget, bringing the total 2022 approved budget for staff costs up to \$71.0 million, and bringing the forecasted variance to this amended budget down to 1 per cent.

Administration costs for 2022 are forecast to be 18 per cent lower than the 2022 approved budget due to the ongoing impacts of COVID-19. Lower than budgeted costs are anticipated related to training, travel, meals, office costs and other administrative costs.

Forecasted costs for 2022 for all other general and administrative cost categories above do not vary significantly from the 2022 approved budget.

Borrowing Costs and Amortization and Depreciation

(\$ million)

	2022 Forecast	2022 Approved Budget ¹⁹	\$ Variance	% Variance
Borrowing Costs	1.1	2.8	(1.7)	(61)
Amortization and Depreciation	24.0	24.6	(0.6)	(2)

Differences are due to rounding

Borrowing Costs

Borrowing costs for 2022 are forecast to be 61 per cent lower than the 2022 approved budget due to a reduction in borrowing requirements resulting from a surplus in working capital.

Amortization and Depreciation

Amortization and depreciation costs for 2022 are forecast to be 2 per cent lower than the 2022 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 2022 BRP

Capital Costs

(\$ million)

	2022 Forecast	2022 Approved Budget ²⁰	\$ Variance	% Variance
Strategic Related Initiatives	8.8	9.1	(0.3)	(3)
Critical Initiatives	2.8	2.2	0.6	27
Other Capital Initiatives & Life Cycle	12.4	14.0	(1.6)	(11)
Total Capital	23.9	25.3	(1.4)	(6)

Differences are due to rounding

The variance between the 2022 forecast and the 2022 approved capital budget is a net decrease of \$1.4 million or 6 per cent from \$25.3 million to \$23.9 million. This variance is mainly attributable to efforts to manage costs and defer where possible.

²⁰ Amounts are from the 2022 BRP

Appendix B: Transmission Operating Cost Definitions

2023 Pool Price Forecast Methodology

Consistent with previous BRPs, now the Budget Development Process (BDP), the AESO used EDC Associates' hourly pool price forecast for 2023. The hourly pool prices were taken from the seed that had an average annual price closest to the EDC summary annual 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 understood that recent market fundamentals, such as those below, have been considered by EDC:

- The impacts of carbon pricing
- Pricing impacts associated with mothballs, retirements, and conversions of coal assets
- Outages of generation units or transmission assets
- Natural gas prices, and
- Renewables additions

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) able 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.

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 95 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 5 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 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 AESO is currently piloting a technology-neutral Fast Frequency Response (FFR) service for a 1-year term. The FFR pilot requirements are based on LSSi but have been adapted for new technology, such as energy storage.

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 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 C: Allocation of Costs

Beginning in 2021, management reviews allocation percentages on an ongoing basis and adjusts accordingly throughout the year. Prior to 2021, allocation percentages were reviewed twice a year, when the annual budget was prepared and at year-end when the allocations were finalized based on actual activities and costs for each department.

Cost Type	Allocation Methodology
Direct Operating	Individual department input/analysis for current year work focus
Shared Services – Corporate Services²¹	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 <u>below or in line</u> 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 <u>above</u> the previously approved budget amount and the amount is determined to be a 'manageable variance'	Management may request approval from the AESO Board and may subsequently issue a stakeholder communication
If the forecast is <u>above</u> 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
<p>A 'manageable variance' is a forecast to actual variance that would be:</p> <ul style="list-style-type: none"> • Less than 10 per cent of budgeted general and administrative expenditures • Less than 20 per cent of budgeted capital 	