

2023 YEAR IN REVIEW

Acting now to create the power system of the future



MESSAGE FROM THE PRESIDENT AND CEO



As the pace of transformation across the sector continued to accelerate through 2023, the commitment and contributions of our AESO staff were exemplary. Managing the transmission system was especially challenging from a physical control perspective. Our System Controllers did an exceptional job of maintaining reliability across an increasingly complex grid due to the ongoing integration of inverter-based generation. They effectively resolved a broad range of challenges over the past year, including the extraordinary 2023 wildfire season. AESO representatives from across the organization successfully collaborated with industry, government and emergency response services to keep the power on for businesses and residents as fires raged in northern Alberta and other areas of the province—no small feat.

The past year marked an increase in engagement with our industry partners, as well as the Government of Alberta, on a broad range of issues. We consulted with government and stakeholders on the challenges of the transforming grid, working to identify the emerging issues related to grid reliability, market sustainability, and affordability, recognizing that the current market is struggling to deliver all reliability attributes.

Our meetings with government were well-informed by input from our industry partners, as we had evolved our engagement approach to facilitate more in-depth discussions. In June 2023, our inaugural Stakeholder Symposium brought together the AESO’s executive team with key industry and association executive leaders. We discussed critical issues and priorities facing the electricity sector, and how various AESO-led initiatives—many of which are defined in our *2023 Reliability Requirements Roadmap*—are intended to address the reliability and affordability challenges posed by a rapidly evolving electricity system.



When government requested the expedited delivery of recommendations on market design, we leveraged the new engagement approach and established an Executive Working Group to obtain input. Senior leadership from across industry provided insights on current challenges and the future evolution of the market. The AESO is immensely grateful for their response to our call to participate, and in helping to define a path to meet the government’s objectives of reliability, affordability, decarbonization by 2050, and reasonable implementation timelines.

Another priority for the AESO in 2023 was responding to the federal government’s proposed *Clean Electricity Regulations (CER)*, a set of measures aiming to decarbonize Canada’s electricity grid by 2035. While the AESO’s formal submission clearly explained our concerns regarding the potential impact of the proposed federal regulations on the future reliability of Alberta’s grid, we also took the unique action of hosting a [news conference](#). Our objective was to ensure policymakers at all levels were aware of and considered the hurdles Alberta faces in transitioning to a carbon-neutral electricity system by 2035.

Overall, 2023 was a year of remarkable challenges and achievements, underscored by the exceptional dedication and collaboration of our team, industry partners, and government. The AESO looks forward to continuing to lead the transformation, managing the changes in a manner that will grow investor confidence while reliably delivering electricity to all Albertans, every minute of every day.

Sincerely,

Michael Law
President and Chief Executive Officer



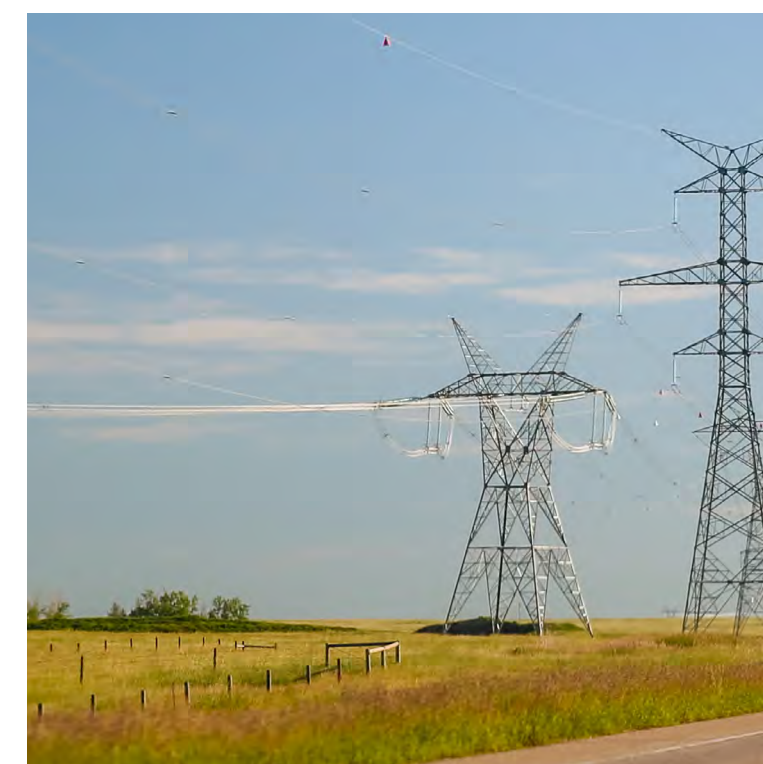
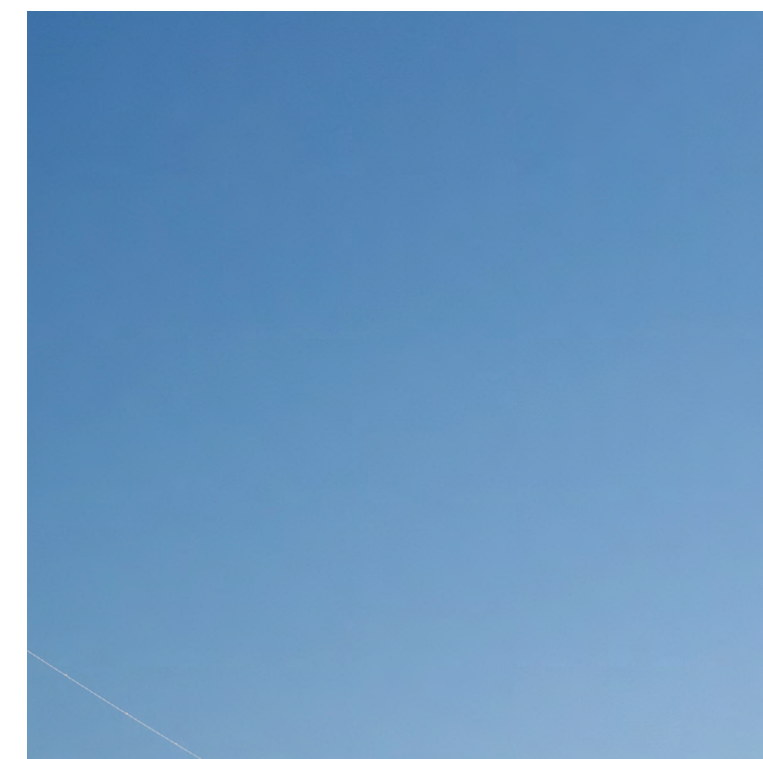
OUR PURPOSE

Providing Leadership to Power Alberta Today and Into the Future

The Alberta Electric System Operator (AESO) is committed to playing a leadership role in enabling the transformation of the provinces’s electricity sector while ensuring reliable, affordable power is always available to Albertans. ”

This *Year in Review* provides a snapshot of how the AESO delivered on our mandate in 2023 by focusing on our strategic priorities, including maintaining reliability and market sustainability through the transformation, and energizing our people and culture, while continuously improving and strengthening our core business functions.

In 2023, the number of participants in the Alberta wholesale electricity market increased by more than 10 per cent to 276, while the value of energy transacted dropped by more than 20 per cent to \$15.8 billion. This reflected the reduction in the annual average pool price for wholesale electricity, which fell approximately 18 per cent from 2022 to \$133.63/megawatt hour (MWh). One of the drivers for the lower price was increased competition in the energy market from new wind and solar generation.





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Our Purpose



Our Achievements



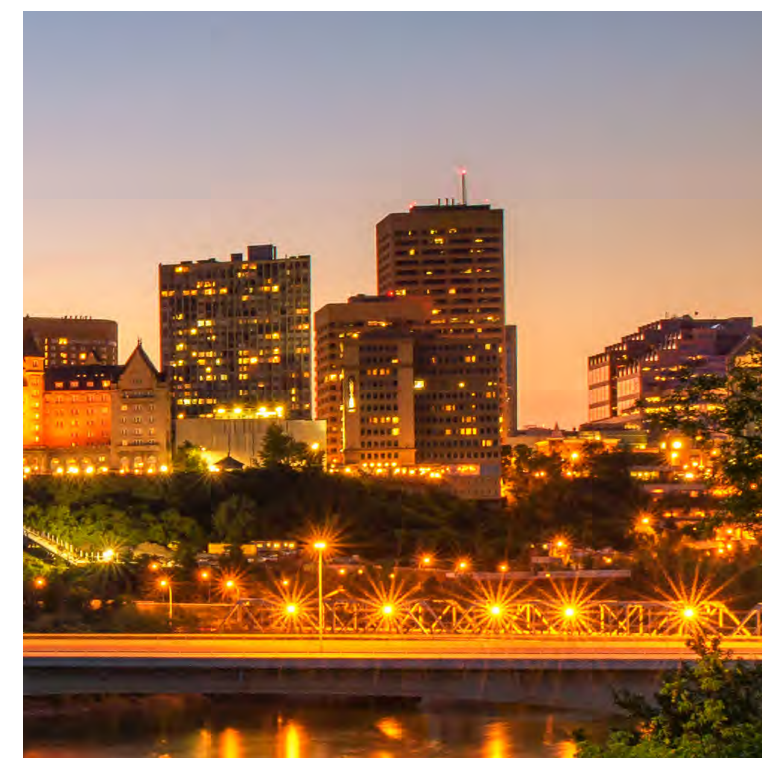
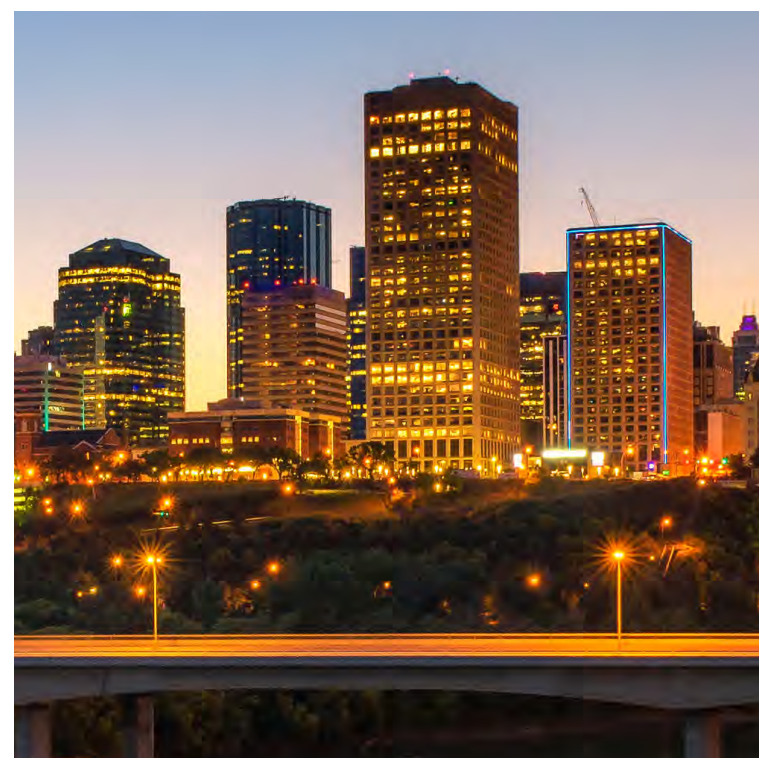
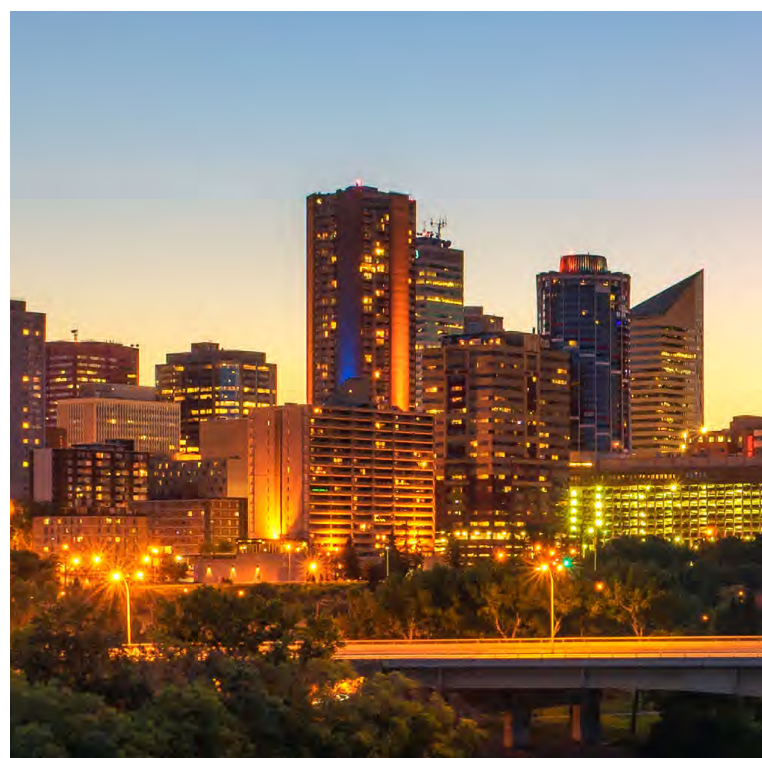
Looking Forward

OUR ACHIEVEMENTS

Transitioning to a Sustainable Market

In 2023, the Government of Alberta was heavily engaged with the AESO, industry, regulators and agencies, providing policy direction and driving the changes needed to ensure the short- and long-term reliability, affordability and sustainability of Alberta’s electric system. The AESO, along with our counterparts at the Alberta Utilities Commission (AUC) and Market Surveillance Administrator (MSA), coordinated and aligned our efforts as we worked to meet our respective directives. A priority was the market structure review,

recognizing that the current market is struggling to deliver all reliability attributes. With a delivery deadline of February 1, 2024, set by the Minister of Affordability and Utilities, the AESO sought input from industry through an expedited and intensive engagement process. We developed and delivered a [*Restructured Energy Market Recommendation*](#), which meets the government’s objectives of reliability, affordability, decarbonization by 2050, and reasonable implementation timelines.





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Enabling Transformation

The AESO has evolved the ISO tariff consultation to establish a foundation of trust and transparency, and leverage industry experience to determine how best to evolve the way regulated transmission costs are recovered from load

customers. We worked with stakeholders to identify and resolve issues, enhance the clarity of the proposed amendments, and promote an understanding of the AESO's objectives.

 NEW ALL-TIME PEAK DEMAND

 SUMMER PEAK DEMAND

 PROVINCIAL ELECTRICITY DEMAND

 TOTAL GENERATION CAPACITY



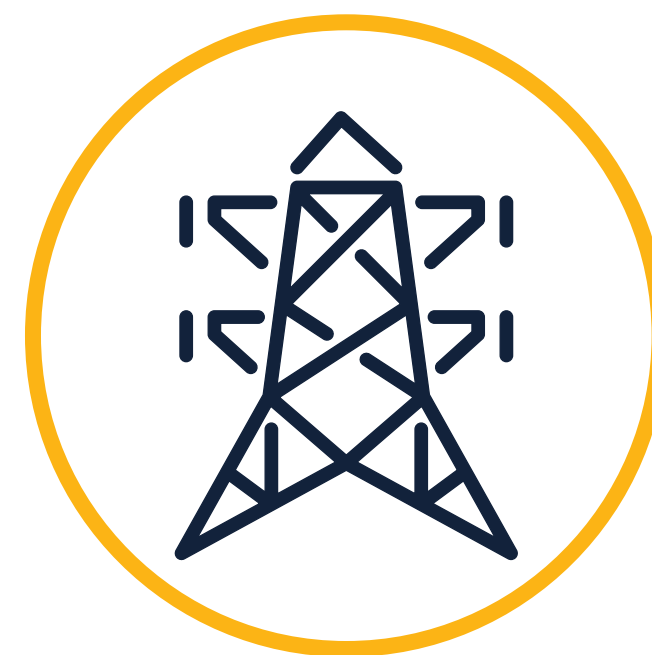
12,384 MW

▲ 191 MW **increase** from 2022



11,522 MW

▲ 141 MW **increase** from 2022



86,293 GWH

▼ 0.3% **decrease** from 2022



20,777 MW

▲ 13.3% **increase** from 2022

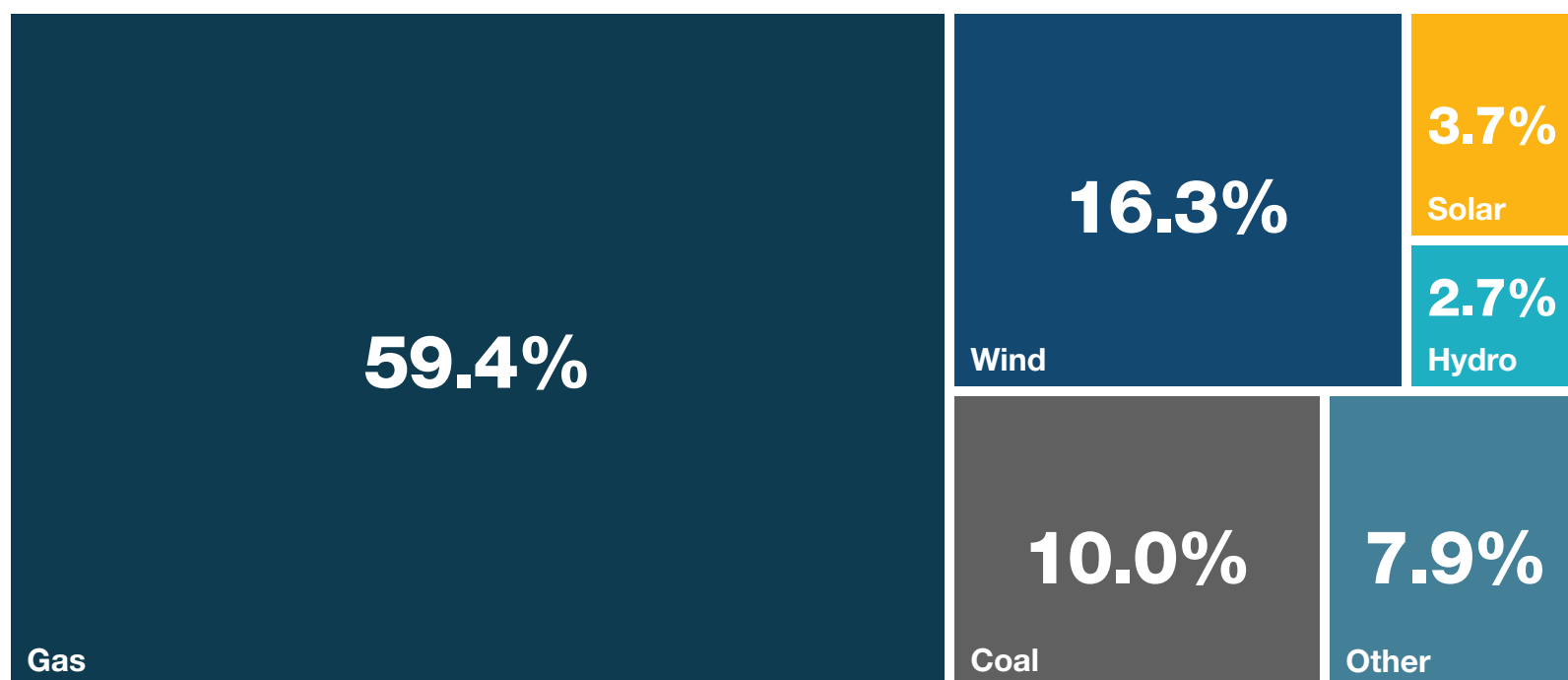


OUR ACHIEVEMENTS

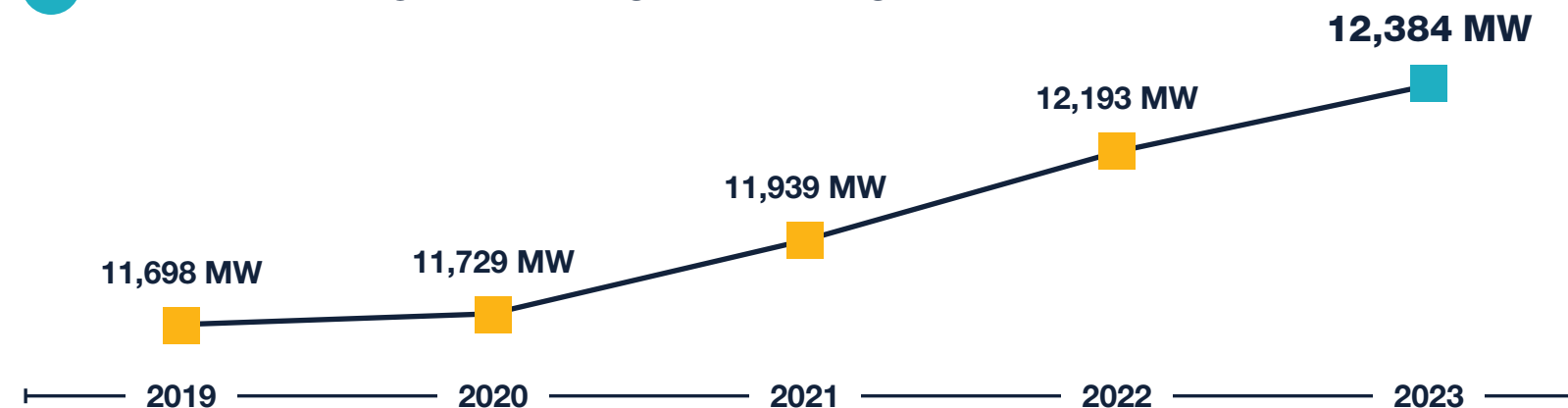
Strengthening and Evolving the Grid

We are well into an energy transformation, and reliability issues resulting from Alberta’s rapidly changing supply mix and generator fleet composition are happening now. We published the [2023 Reliability Requirements Roadmap](#), which addresses complex engineering challenges in response to the transformation of the province’s electricity system. The AESO progressed action items in the critical reliability focus areas of frequency stability, system strength and flexibility capability.

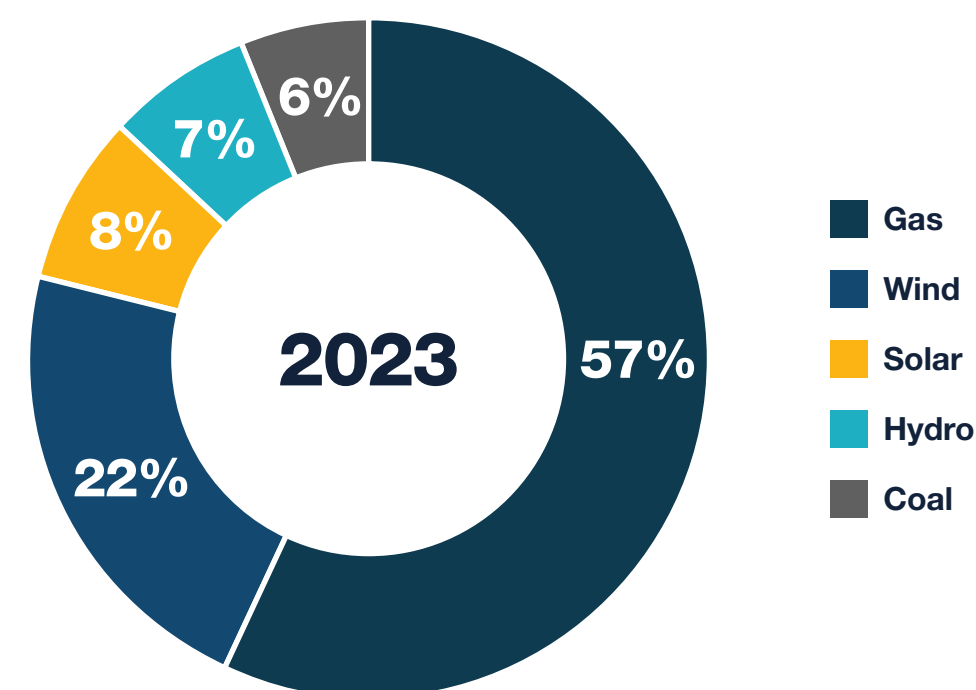
NET-TO-GRID GENERATION



PEAK DEMAND OVER THE PAST FIVE YEARS



INSTALLED CAPACITY BY FUEL SOURCE





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Looking Forward

OUR ACHIEVEMENTS

Advancing Energy Storage

The AESO filed new and amended ISO rules and definitions that will facilitate new technologies that are an important part of the energy transformation and maintaining electric system reliability. The filing—and subsequent approval of the

amendments in June—was a significant achievement, marking the culmination of years of hard work with stakeholders to promote an understanding of the AESO’s objectives, identify and resolve issues, and clarify proposed amendments.

The Energy Storage ISO Rule Amendments consist of:



1
NEW
ISO RULE



35
AMENDED
ISO RULES



145
STAKEHOLDERS PARTICIPATED IN
THE AESO’S CONSULTATION PROCESS



16
ISO RULES RESTRUCTURED
(FROM 7) AND AMENDED



4
NEW
DEFINITIONS



4
STAKEHOLDER
SESSIONS HOSTED



36
AMENDED
DEFINITIONS



5
DEFINITION
RETIREMENTS



3,331
PAGES OF CONSULTATION MATERIAL
FILED WITH THE APPLICATION



OUR ACHIEVEMENTS

Enhancing Grid Resiliency and IT Operational Readiness

While the large-scale adoption of renewables generation offers a compelling and exciting future, it also presents new challenges with respect to the complexity of information technology and infrastructure. The AESO continued to make significant progress in assessing short- and long-term needs of our critical systems and making the changes to meet these challenges, ensuring System Controllers have a solid foundation to keep Alberta’s grid and market running reliably today and into the future.

Streamlining the Connection Process

The AESO worked extensively with stakeholders throughout 2022 and 2023 to develop and refine the Connection Process in response to the growing volume and complexity of projects. The goals of these streamlining changes are to deliver shorter project execution, provide greater efficiency and project certainty, minimize rework, and align to available resource capacity. In 2023, a key aspect of the revised process included the introduction of a Cluster Assessment Process, which involves studying projects in a defined geographic region in “clusters.” This approach also helps the AESO to identify congestion risk and improve alignment with regional planning.

Highlights from Cluster 1 Application Period*

- The AESO received **146 System Access Service Requests (SASRs)** for over **22,000 MW***
 - **91 connection** and **54 Behind-the-Fence (BTF)** projects
- Busiest regions:
 - Central | **55 SASRs** for **8,915 MW**
 - Southeast | **31 SASRs** for **4,567 MW**
- MW by generation type:
 - Solar | **12,000 MW**
 - Wind | **4,400 MW**
- **58 SASRs** were either entirely storage, or had storage included, for **2,800 MW** of storage discharge capability

**Note: some projects were cancelled and/or did not meet requirements to remain in the Connection Process.*



OUR ACHIEVEMENTS

Reinforcing the Transmission System

In 2023, the AESO filed a Needs Identification Document (NID) Application to reinforce transmission in the northeast area of the City of Edmonton to reliably serve growing demand for electricity in the area and replace aging transmission infrastructure. We also obtained Alberta Utilities Commission approval on our NID for the Vauxhall Area Transmission Development, concurrent with approval for the transmission facility owner’s Facility Application.

This includes increasing the capacity of existing lines and adding a new line to connect new generation in the area. The Vauxhall NID approval was noteworthy and important to the AESO and stakeholders because it was the first time the AUC had granted a 15(2) exception (allowing for congestion). This provided important guidance in the decision regarding the circumstances in which a 15(2) application is required, the timing of an application, and the type of information to include.

Energizing People and Culture

The AESO’s skilled and diverse workforce is leading the transformation through their commitment to technical and professional excellence. Revisions to our performance assessment process—which focused on key results, competencies and alignment with the AESO’s values—facilitated our shift toward a coaching style that supports the development and career progression for all employees.

LinkedIn Learning, which contains a vast catalogue of resources for employees with all levels of experience and knowledge, was also introduced in 2023. The application features targeted learning streams for different employee and leader interests that can be tailored for delivery based on an individual’s preferred pace. This is an optimal solution for employees with time-constrained schedules.



STAKEHOLDERS ENGAGEMENT



4,390

STAKEHOLDERS ENGAGED



261

SESSION HOURS



66

STAKEHOLDER SESSIONS

Learn more about our Stakeholder Engagement and Engagement Framework on aeso.ca and [AESO Engage](#).



LOOKING FORWARD

Enabling the transformation of the Alberta Interconnected Electric System (AIES) remains a critical focus for the AESO in 2024:

- Reliability solutions and operational readiness remain a priority during a time of unprecedented state of strain on Alberta’s electric system. As changes in the generation fleet continue to accelerate, the AESO is progressing action plans identified in the *2023 Reliability Requirements Roadmap* to ensure adequate frequency response and sufficient flexibility and system strength. We are leveraging methods and tools that can be implemented efficiently while maintaining flexibility and/or alignment with anticipated changes to the market framework.
- Changes to the market framework are needed to foster reliability and investor confidence as the province moves towards decarbonization. The AESO delivered a paper to the Minister of Affordability and Utilities that outlined recommendations, developed in collaboration with stakeholders, for a Restructured Energy Market. We will continue to work with stakeholders to advance government’s policy objectives and to develop a practical and reasonable transition approach that maintains market confidence. We will continue to support and inform government on development of the necessary legislation and regulatory shifts.

With an increasing rate of change and regulatory uncertainty at provincial and federal levels, the AESO is intensifying its planning efforts, acknowledging that scenarios previously forecast as unlikely are becoming more probable. To successfully manage the pace and volume of work in 2024, the AESO will assess the impacts of transmission policy and market framework changes and prioritize critical issues, ensuring a forward-looking approach.

We are committed to working closely with industry and government to drive the transformation of Alberta’s electric system while managing the transmission system and electricity market efficiently and reliably, every day.



aeso

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