

2020 YEAR IN REVIEW

GUIDING INDUSTRY TRANSFORMATION WITH A FOCUS ON FLEXIBILITY, RESILIENCY & ADAPTABILITY

VISION

As the trusted leader, the AESO is shaping the transformation of Alberta's electricity future to deliver reliability and enhance the quality of life for Albertans.

MISSION

The AESO provides for the safe, reliable and economic operation of the Alberta electricity system while facilitating a fair, efficient and openly competitive market for electricity.

In 2020, the Alberta economy and power industry were significantly impacted by record-low oil prices and the emergence of the COVID-19 pandemic. Despite these unforeseen challenges, the Alberta Electric System Operator (AESO) successfully delivered its complex mandate through the unwavering commitment and diligence of its employees. Following the implementation of public health measures aimed at reducing the spread of the coronavirus, AESO employees quickly adapted to the remote work environment: day-to-day business was accomplished, grid reliability was maintained, competitively priced power was delivered, and stakeholders were engaged virtually, supporting the ongoing evolution of the province's grid and electricity market.

This *Year in Review* highlights the successful progression and delivery of initiatives aligned with the three pillars of the AESO's *2019-2023 Strategic Plan*—People, Framework and Technology. Throughout 2020, identifying opportunities to reduce regulatory burden and cost were foremost considerations across all areas of planning and operations.



PEOPLE

Fostering talent agility and building organizational capabilities

The AESO maintained its focus on fostering a knowledgeable, agile, and solution-oriented culture, building on a strong foundation of programs designed to grow and develop employees' skill sets and expertise within their disciplines. A priority in 2020 was expanding the functional role-based competencies of the AESO's workforce to enhance future organizational capabilities. This was achieved by facilitating cross-functional engagement through secondments, exchange programs, education initiatives, and teams dedicated to driving strategic initiatives. The AESO is pleased to report this approach is building employees' business acumen and capabilities while also fostering diverse and adaptive ways of organizational learning.

A *Secondment Practice* was formally established to guide employees and leaders on the application process and secondment experience. Employees have the opportunity to apply their skills, knowledge, experience and competencies to a new business or operational function. In addition to aiding employee development and broadening experience, secondments facilitate cross-functional organizational knowledge sharing.

In 2020, the AESO established a cross-functional team to drive change in four areas: right-sizing governance, right-sizing project management, challenging committee culture and delegating decision making. In 2020, the team simplified processes, identified efficiencies, and removed hierarchy. These changes have improved flexibility and agility, resulted in time and cost savings through streamlined processes, and provided employees with more opportunities for interesting and challenging work.

Enhancing and promoting inclusion and diversity

The AESO recognizes the intrinsic value that its diverse employee population brings to the organization. To support the AESO's objective of fostering an inclusive, safe, and productive environment that allows employees to thrive and be their best, an *Inclusion & Diversity (I&D) Statement* and *I&D Practice* were introduced in 2020 to support the *I&D Program*. The new *I&D Practice* outlines a consistent approach for employees in the evolution of the AESO's culture toward workplace flexibility, agility, collaboration and innovation.

Incorporating stakeholder knowledge and expertise into AESO decisions and actions

The *Stakeholder Engagement Framework*, formally rolled out in January 2020, provides structure and consistency to the AESO's engagement approach. After quickly transitioning to virtual meetings in early 2020 due to the pandemic, the AESO facilitated 47 in-person and virtual sessions, with an additional 25 written consultations. Stakeholders provided valuable expertise and insight, helping to shape decisions on a range of important initiatives such as the budget review process, energy storage, Independent System Operator (ISO) rules and reliability standards, ISO tariff, grid optimization, and market participation.

The AESO also established two new forums for encouraging collaboration, open dialogue and improving alignment on strategic long-term priorities for the electricity industry: a *CEO Industry Roundtable* and an *Industry Associations and Agencies Roundtable*. A cross-section of senior electricity industry representatives from the private sector, associations and agencies are participating.

**ACHIEVING SUCCESS
THROUGH COLLABORATION
& ENGAGEMENT**



FRAMEWORK

Ensuring delivery of a stable and flexible electricity framework

The AESO continues to focus on optimizing the grid and enhancing methods to maximize the use of existing transmission infrastructure, increasing certainty for the timing of new infrastructure, and seeking lower-cost solutions. Congestion analysis is being used to define construction milestone triggers, aligning transmission construction as close to when it is needed to minimize cost to ratepayers.

The *Central East Transfer-out Transmission Development Needs Identification Document Application* was filed with the Alberta Utilities Commission (AUC) in 2020. The project will enable the integration of 700–900 megawatts of competitive renewable generation into the market. The new congestion analysis methodology was employed to time construction for this project.

Pulling together to reduce red tape

The AESO has been working diligently to progress the Government of Alberta's *Red Tape Reduction Initiative*, a commitment to reduce regulatory requirements by one-third by 2023. A comprehensive review of the AESO's regulatory requirements was undertaken, and anticipated outcomes and impacts, cost-savings for industry, target dates and action plans were defined. The vast majority of the AESO's regulatory requirements are within ISO rules and reliability standards and the ISO tariff. Because stakeholder engagement and a full regulatory process are required before changes can take effect, efforts in 2020 focused on Information Documents. Over the longer term, the emphasis will shift toward identifying opportunities within ISO rules and reliability standards, the ISO tariff, and the connection process. Every team across the organization is working to support red tape reduction, either directly or indirectly, to drive better cost management across the value chain and create a simpler and more agile approach to business processes.

Modernizing the ISO tariff

The AESO is proposing changes to the ISO tariff, specifically to the bulk and regional rate design, to support the ongoing transformation of Alberta's electricity system while also ensuring all customers pay their fair share of future transmission costs. Following a delay due to the pandemic, in fall 2020 the AESO re-initiated the stakeholder engagement process, which continues through 2021. Consultation objectives included defining high-priority design elements. The AESO is targeting introduction of the preferred rate design for the bulk and regional ISO tariff in early 2021.

Changing the AESO connection process

In the 2018 ISO Tariff Application, the AESO proposed changes on the timing for the execution and effectiveness of System Access Service Agreements, the timing and application of Generating Unit Owner's Contribution amounts, and other process efficiencies.

Extensive planning and stakeholder engagement on the connection process and ISO tariff implementation were conducted in 2020 in anticipation of AUC approval, ensuring a smooth transition on January 1, 2021.

Meeting the customer-connection mandate

The AESO and its customers safely and successfully overcame the challenges of working through the pandemic—in 2020, the AESO consistently managed the execution of more than 200 customer projects. Enabling renewables generation and large power consumer connections in an efficient and cost-effective manner is integral to supporting Alberta's economy, including a favourable capital investment climate and job market.

Other achievements in 2020 included significant enhancements to the existing *AESO Connection Project List*, based on stakeholder input and suggestions. A complementary interactive Geographic Information System map, scheduled for deployment in 2021, was also developed to support customers in the connection process.

Coordinating transmission and distribution system planning

The ongoing transformation of the grid from the one-way delivery of electric energy to an interconnected system of two-way power flows requires increased coordination and planning between the transmission and distribution systems. In 2020, the AESO continued its work with industry and government on the *Transmission/Distribution Coordinated Planning Framework (Tx/Dx Framework)* to support the coordination and alignment of planning, forecasting and reliability requirements at the transmission and distribution interface.

With the continued growth of distributed energy resources (DER) within distribution networks impacting energy flows in both directions, the distribution system was a key focus in 2020. The AESO participated in the *AUC Distribution System Inquiry*, progressed initiatives under the *Distributed Energy Resources Roadmap (DER Roadmap)*, and engaged transmission facility owners (TFOs), distribution facility owners (DFOs), industry and ratepayer groups through a series of collaborative technical sessions. Through the engagement process, the AESO gained important insight into the rationale for DFO requests, while improving DFO understanding about the AESO's public interest obligations for decisions on new transmission.

Feedback and recommendations were gathered to build alignment on a decision-making framework for DFO-driven transmission projects. Objectives for the framework, targeted for completion in 2021, include helping to improve project efficiencies and providing transparency in decision-making for stakeholders on whether expansion or enhancements of transmission system capability are required.



TECHNOLOGY

Implementing the DER Roadmap

The DER Roadmap, which outlines a plan for a future state that is characterized by a higher penetration of DER, was published in June 2020. Activities within the DER Roadmap include evaluating the potential impacts to reliability and the ISO tariff. Priorities in 2020 included defining technical connection requirements and ensuring locational information is centrally available.

Significant collaboration amongst the AESO, DFOs and TFOs was undertaken to develop the DER Roadmap and will be ongoing as new DER and energy storage projects are integrated into the transmission system.

DER initiatives are being progressed by a large AESO-wide cross-functional team. The team is focused on ensuring ongoing alignment with interrelated initiatives, including energy storage modeling, market participant thresholds and aggregation, Tx/Dx framework and the ISO tariff.

Evolving energy storage

The electricity industry is experiencing tremendous growth and technology innovation in energy storage. The AESO recognizes that energy storage resources, such as battery storage, are a game-changing technology for Alberta and has invested significant effort and resources in working with industry and government to progress its *Energy Storage Roadmap*. In 2020, the AESO:

- facilitated the connection and energization of three transmission and distribution-connected battery storage projects by their in-service dates;
- developed information documents to provide clarity on participation in the energy and ancillary services markets, within the existing framework and rules; and
- established an Energy Storage Industry Learnings Forum (ESILF) to gather energy storage industry leaders from across North America to share perspectives on energy topics and discuss key learnings from energy storage integration in other jurisdictions.

Supporting the workforce and replicating the System Coordination Centre

One of the most significant technology achievements was the smooth transition on March 16, 2020 of approximately 400 employees from the AESO's offices to working from home due to urgent public health measures brought about by the pandemic. With a strong technology platform already in place, the Information Technology (IT) team was well positioned to expedite the roll-out of new tools and software—a previously planned 2020 IT strategic initiative—ensuring employees had the equipment and connections to continue their work without interruption, and ultimately increase productivity through mobility.

Maintaining the health and safety the AESO's System Controllers, who are classified as essential service providers, was one of the organization's top priorities. At the outset of the pandemic, the AESO modified operations and established rigorous new protocols, including activating the Back-up Coordination Centre. To further mitigate risk, the entire System Coordination Centre was replicated in a third location within weeks of the pandemic, an incredible technology achievement.

Replacing legacy systems

The design and integration of the AESO's new Finance and Human Resource management systems into a new Enterprise Resource Planning tool was completed through remote processes in 2020, and successfully launched on the first day of the new year. A comprehensive employee awareness and change management program was also developed to support the implementation of the new tool.

Advocating for new technologies

A new *Technology Advocate* role was launched for industry to engage the AESO on technology and innovation. A framework of technology areas/owners was also developed in conjunction with this role to help the AESO monitor key value-chain technologies impacting the electricity industry.

Deploying, planning and protecting technology

In 2020, a new communication protocol between industry parties and AESO System Controllers, called Open Access Gateway, was seamlessly deployed to the Energy Management System (EMS). Vulnerability assessment scans and a mock penetration test on the EMS were also successfully conducted so cyber-security risks to the AESO's most critical systems can be further reduced.

The AESO also undertook a comprehensive review of Grid & Market systems and tools and developed a flexible maximum-value, multi-year investment plan as part of its cost-management initiative.

Investigating new technologies

The AESO is actively exploring new technologies that could benefit the transmission system, such as the application of Smart Wires. This powerful control device is designed to detect when a transmission line reaches capacity, and redirect flow to underutilized lines. The application of this tool would allow the AESO to defer or avoid building new transmission lines to further optimize the existing system and reduce future costs for customers.

LOOKING FORWARD

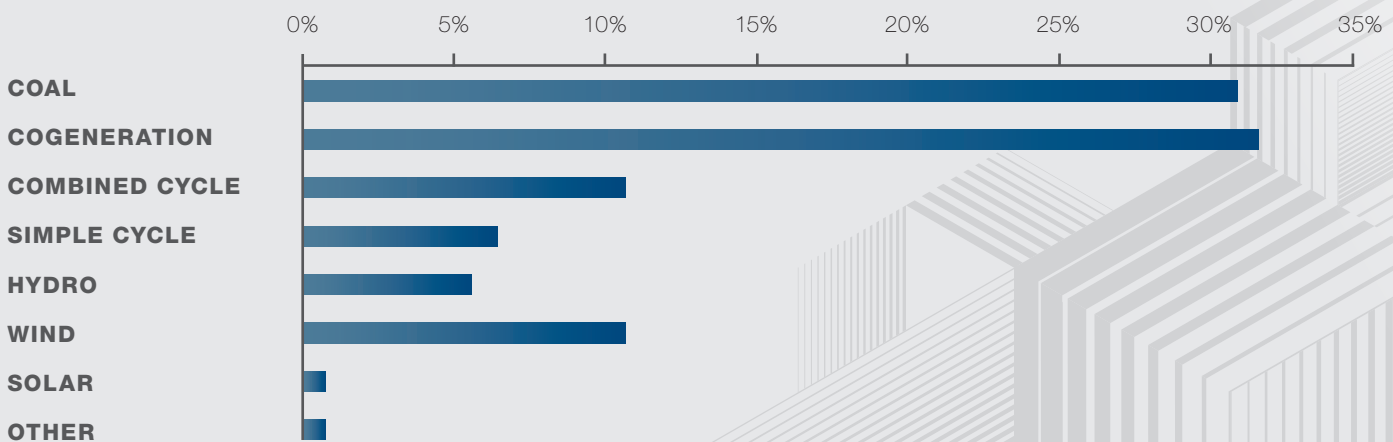
The AESO continues to monitor the impacts of the COVID-19 pandemic on its operations. Precautions to minimize risk will remain in place in alignment with continued direction from the government. The AESO will continue to be an organization that is flexible, resilient and adaptable.

In 2021, the AESO remains committed to minimizing cost, reducing red tape, developing appropriate pricing signals, and actively participating in ongoing transmission policy work. With the economic challenges impacting the province, continuing to create efficiencies through the optimization of existing infrastructure to achieve long-term cost reduction also remains a top priority.

The AESO's comprehensive understanding of the Alberta Interconnected Electric System, in-depth expertise across the full value chain, strong leadership and strategic focus will be instrumental to our success.

The AESO is well-positioned to safely and efficiently integrate all forms of generation and load requirements onto the transmission system, ensuring investor confidence and supporting Alberta's economic recovery.

INSTALLED CAPACITY 2020



**PROVINCIAL
ELECTRICITY
DEMAND**

83,115 GWh

▼ 2.4% decrease from 2019



**TOTAL
GENERATING
UNITS**

390

▲ increase of 38 units from 2019



**TOTAL
GENERATION
CAPACITY**

16,270 MW

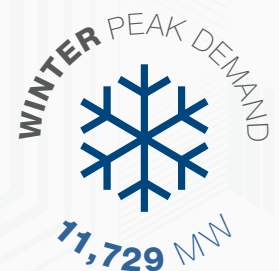
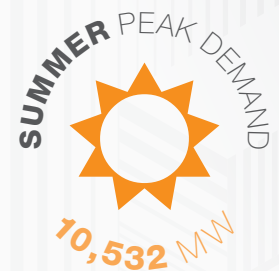
▼ 1.5% decrease from 2019



**AVERAGE
POOL
PRICE**

\$46.72 MWh

▼ 15% decrease from 2019



(New all-time peak load)

NOTE FROM THE PRESIDENT AND CHIEF EXECUTIVE OFFICER



The AESO has expertise in forecasting, developing scenarios, and planning for contingencies; however, no one could have predicted the global COVID-19 pandemic. We were truly put to the test as we were forced to transition, literally overnight, to a new operating environment and we were tested daily

at every level—as people, as a business community and as a society.

Teams across our organization mobilized and collectively met the challenge head-on. Over the past year, we delivered on our strategic priorities across each area of our mandate, while maintaining reliable operation of the grid and energy market. We made meaningful differences for Albertans, not only by literally keeping the lights on through the darkest of times, but by helping to support the provincial economy through bill deferral activities and by encouraging private sector investment through a stable market and commitment to an unconstrained transmission system.

The AESO consistently managed the execution of more than 200 customer projects, including integrating new solar and wind generation, facilitating the connection and energization of transmission and distribution-connected energy storage projects, and delivering electricity to major industrial consumers.

Following the formal rollout of our new *Stakeholder Engagement Framework* in January 2020, a robust schedule of engagements on a range of initiatives was established, and we were eager to solicit your input, knowing it would help us achieve our business goals. Your willingness to abruptly change course with us and engage virtually to accommodate social distancing requirements is sincerely appreciated.

The AESO recognizes that your businesses were also under pressure, adapting to interruptions in your operations due to new health and safety protocols, and dealing with resource constraints that were endemic due to depressed oil prices and the economic impact of COVID-19. Thank you for your collaboration and commitment to the process.

Through the pandemic, the AESO will continue to provide stability to an industry that is moving through substantive transformational change. We recognize the financial pressures on all Albertans and are committed to cost management within the AESO's own budget, as well as across the industry value chain. Facilitating business in Alberta and ensuring a simple and agile approach to the AESO's operations through red tape reductions remain top priorities.

For the foreseeable future, we will continue to work with stakeholders in a virtual environment to progress important projects, such as the ISO tariff, and to evolve ISO rules and standards, as well as to advance and align initiatives under the Transmission/Distribution Coordinated Planning Framework and our various roadmaps, including Distributed Energy Resources, Energy Storage and Ancillary Services.

I would like to extend my sincerest thanks to our staff, leadership and Board for their hard work and commitment to serving all Albertans through the challenges of 2020.

Sincerely,



Michael Law
President & Chief Executive Officer