

## Context

Alberta's power sector is undergoing significant change. This change is being driven by multiple factors within the power system and beyond. New technologies, carbon policy, broad electrification and a societal desire for cleaner forms of energy are creating substantial and rapid change across the electricity value chain, from production to consumption. These changes are disruptive and have the potential to drive significant cost and impact reliability if not managed appropriately; ultimately, consumers will bear these impacts. In most cases, the nature and magnitude of the potential policy changes are not well understood outside the power industry. This information gap and resulting lack of awareness of the potential consequences creates a material risk to the power industry and the organizations that operate within it.

## Purpose

The AESO believes it is necessary to stimulate discussion and determine a set of collective actions that can provide guidance to industry, government and consumers to ensure a sustainable, reliable and cost-effective future electricity system. To achieve this outcome, it is necessary to develop good data, an understanding of options and choices that need to be considered and reach a level of consensus and alignment to drive action.

## Discussion

As opinions will differ significantly on what the correct carbon policy might be, or which technologies will ultimately become mainstream, it is important to focus on areas of high-level agreement. What we can likely all agree on as an industry is that electrification and decarbonization are strong, growing trends with significant cost, reliability and consumer impacts if not managed appropriately. The reliability/cost balance is a critical lens to assess all changes through and rests with the AESO, Alberta Utilities Commission (AUC), transmission facility owners (TFOs) and distribution facility owners (DFOs) in their respective roles, while commercial investment and technology choices will be driven by others in industry. Although there are differing roles for our respective organizations, coordination and alignment will be critical to ensuring a least-cost outcome.

### *Decarbonization and Electrification*

The societal goal of decarbonization is here to stay, and while opinions will vary on the timeframe and the technological solutions to get us there, the future of the power system is clear: lower to no carbon emissions. Without a concerted and unified focus from industry, there is a high risk that policy decisions will be made without a full understanding of the physical implications, timeline requirements or costs associated with different paths to decarbonization. This will be negative to all parties concerned, with a risk of inconsistent or shifting policy approaches that are costly and disruptive.

Closely linked to the concept of decarbonization, yet fundamentally different, is that of electrification. Electrification is both a challenge and an opportunity for the Alberta power sector as we seek a solution to decarbonization. The duality of opportunity and challenge of electrification comes from the expected load growth that electrification drives. Decarbonizing the current grid is a challenge, yet load growth is the simplest mechanism to maintain cost efficiency and reduce rate shock to consumers as all aspects of the value chain rebuild themselves to serve a different kind of consumer and system. Electrification, especially

in transportation, is a significant future load growth driver that can help mitigate some impacts of decarbonization - yet it brings cost implications of its own.

With load growth, however, comes a significant challenge to the power system, primarily at the distribution level, where physical infrastructure is not designed to meet the demands of future electrification. The cost implications of upgrading a distribution system are not well socialized and the cost-recovery approach and proactive build requirements place the distribution companies in a challenging position. Aggressive investment to facilitate the electrification shift will drive significant cost to consumers early on while adoption remains lower. Conversely, distribution companies that choose not to invest may find themselves in the position of being a potential barrier to electrification in the future.

### *Time horizons and stringency*

The pace of change and high-level policy desires have created a range of potential time horizons and decarbonization stringency outcomes. The most aggressive approaches focus on a decarbonized future in the mid-2030s, while others look to a 2050 timeline.

In the same manner that time horizons vary, there continues to be a lack of clarity with respect to the actual nature of decarbonization. Zero carbon emissions can be contrasted against a range of “net-zero” approaches.

For Alberta’s power system, little concrete work has been undertaken to map the possible paths and approaches to determine what is physically achievable and when, and which ideas and concepts are unattainable or will result in grid reliability concerns or untenable cost escalation.

## Path forward

With the support of the Industry CEO Roundtable, the AESO proposes that **Decarbonization** and **Electrification** be recognized as the electricity industry’s two strategic priorities in Alberta and that industry and the AESO undertake a collaborative process to determine the highest impacts of each of these broad trends to the electricity framework. We will achieve this by assessing what the potential paths of decarbonization and electrification will mean to Alberta under differing timelines and stringency levels along with grid-level impact and associated cost drivers. This will require a unified effort by the AESO and industry and an analysis from the AESO, together with analysis from industry, will result in the most comprehensive assessment.

This collective effort will allow industry to speak with a consistent voice to policy makers, and the general public, around the known and agreed upon aspects of electrification and decarbonization, and the practical impacts and realistic paths forward for the province. Without this consistency, differing commercial and organizational perspectives will create confusion for government, paralyzing its ability to advance policy in a structured and strategic manner.

***Proposed Next Steps:***

- 1) Confirmation that decarbonization and electrification are Alberta's two key strategic priorities
- 2) AESO analysis (Q1-Q2 2022)
  - a. Net zero and zero carbon scenarios and associated time horizons (2035 – 2050)
  - b. Develop grid level impacts of scenarios and reliability envelope assessment.
- 3) Industry analysis
  - a. Electrification impacts to the distribution system
  - b. Alberta-specific generation technologies such as carbon capture and sequestration.
- 4) Discuss implementation strategy
  - a. Collectively, what do we do with this information?
  - b. How do we package and share the analysis?
  - c. What is our approach with the provincial and federal governments?
  - d. Do we engage the public in an information campaign?