

Workshop #1

Narrative June 21, 2023



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Energy Futures Lab

An award-winning, multi-stakeholder and rights holder social innovation lab focused on the energy transition

The Energy Futures Lab is an Alberta-based coalition of innovators and leading organizations from across the energy system. It was created to address a growing sense of polarization in Canada and to tackle the most pressing system-level challenges in the energy transition. Since its inception in 2015, the Energy Futures Lab has brought together stakeholders and Indigenous rights holders from across the Canadian energy system to collaboratively accelerate progress towards our vision of a net-zero energy future, drawing on diverse perspectives to create innovative and enduring solutions to complex, system-level challenges.

Together we must uncover the solutions that will power Alberta's bright future.

A new reality is already upon us, demanding a response from a system out of sync. Applying the Energy Futures Lab's unique social innovation lens, inclusive of recognizing the rights held by Indigenous communities, to the Alberta electricity challenge can help create alignment in direction, build capacity to navigate and overcome barriers, and accelerate the adoption of innovative ideas.

With a net-zero grid being central to many decarbonization efforts, there is an increasing urgency to address this issue. To do this, we are bringing together key stakeholders and Indigenous rights holders in Alberta's electricity system to develop a systems-level understanding of its root challenges, a vision for its future, and a coordinated approach to test potential solutions.

The Natural Step Canada Partnership

The Energy Futures Lab is a part of a partnership fostering a strong and inclusive economy that thrives within nature's limits.

The Energy Futures Lab operates as an independent initiative of The Natural Step Canada, alongside the Canada Plastics Pact, Circular Economy Leadership Canada, PLACE Centre, and the Canadian Alliance for Net-Zero Agri-food (CANZA).

These multi stakeholder and Indigenous rights holders coalitions foster collective action on critical issues informed by evidence and research, including from the Smart Prosperity Institute's research network and national policy think tank.



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About Alberta's Electricity Future

How might Alberta's electricity system collaboratively orient and organize itself to meet the needs of the net-zero economy of the future?

Unlocking Canada's progress towards net-zero will require a big evolution of our electricity systems. This evolution is also key to preparing our technologies and industries to compete in emerging growth opportunities and rapidly decarbonizing global markets.

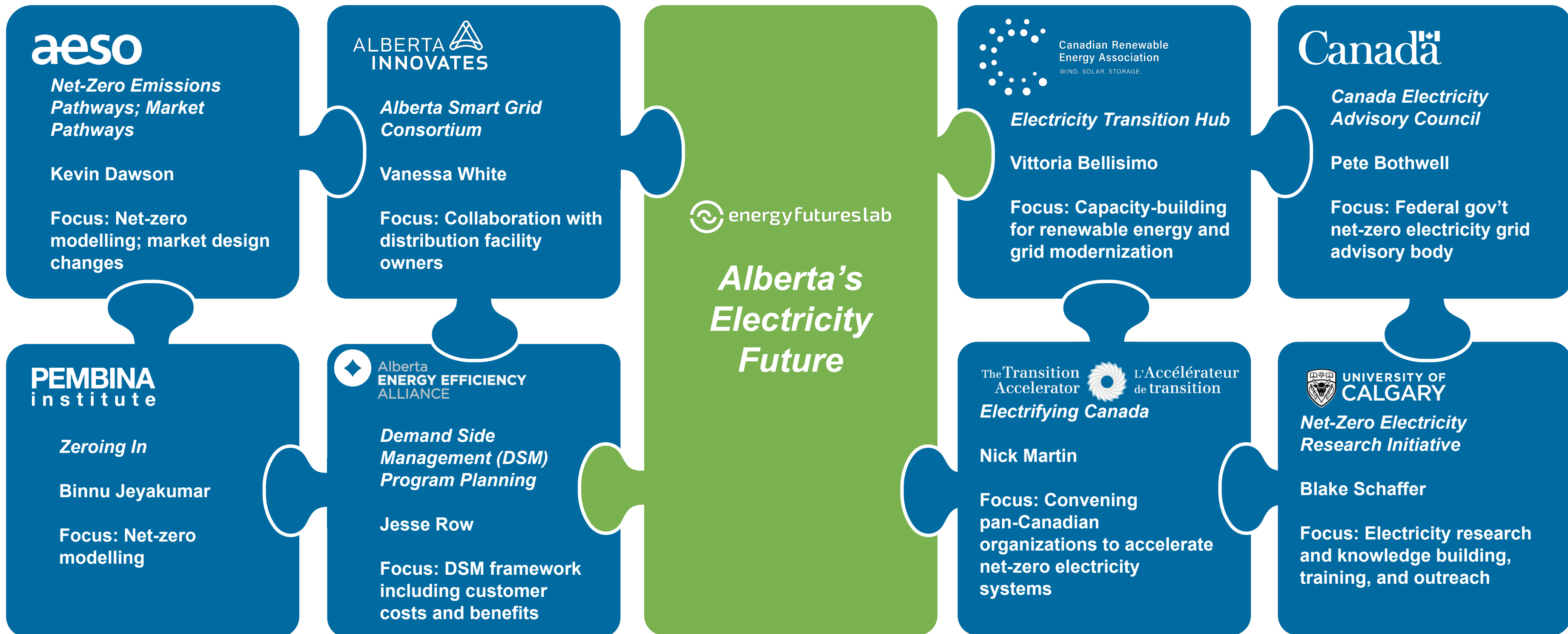
Even as experts estimate that by 2050 Canada will require an increase in supply between 62 per cent and 210 per cent, federal regulations requiring Canada's electricity grid to have net-zero emissions by 2035 are expected to be released in 2023.

While misgivings exist about the feasibility of the proposed time frame, **there is growing agreement about the importance of preparing the grid to overcome the twin challenges of increasing consumer demand and reducing emissions.**

Given individual provinces' unique context, needs, and readiness to dig into the challenge, **there is no one-size-fits-all solution.** And while there is no shortage of ideas about how to carve a path forward, the reality is that individual system actors cannot make this journey alone. For Alberta's grid to enable future prosperity and support the province as it grows and diversifies its economy, **alignment and coordination are essential.**

Formally launched in March 2023, Alberta's Electricity Future (AEF) is a three-year initiative that will collaborate and partner with traditional electricity voices like industry and government while focusing on historically underrepresented groups such as youth and Indigenous rights holders to align on collective actions that will enable the whole system to progress in a way that ensures reliable, safe, and affordable electricity for Albertans. We acknowledge that to date our engagement with Indigenous communities has been minimal. We commit to a more meaningful and robust engagement going forward.

Trust and collaboration are central to shaping the future of Alberta's electricity system. **Aligned leaders can be a powerful voice for influencing the future of electricity and driving actions that deliver the most effective outcomes.**

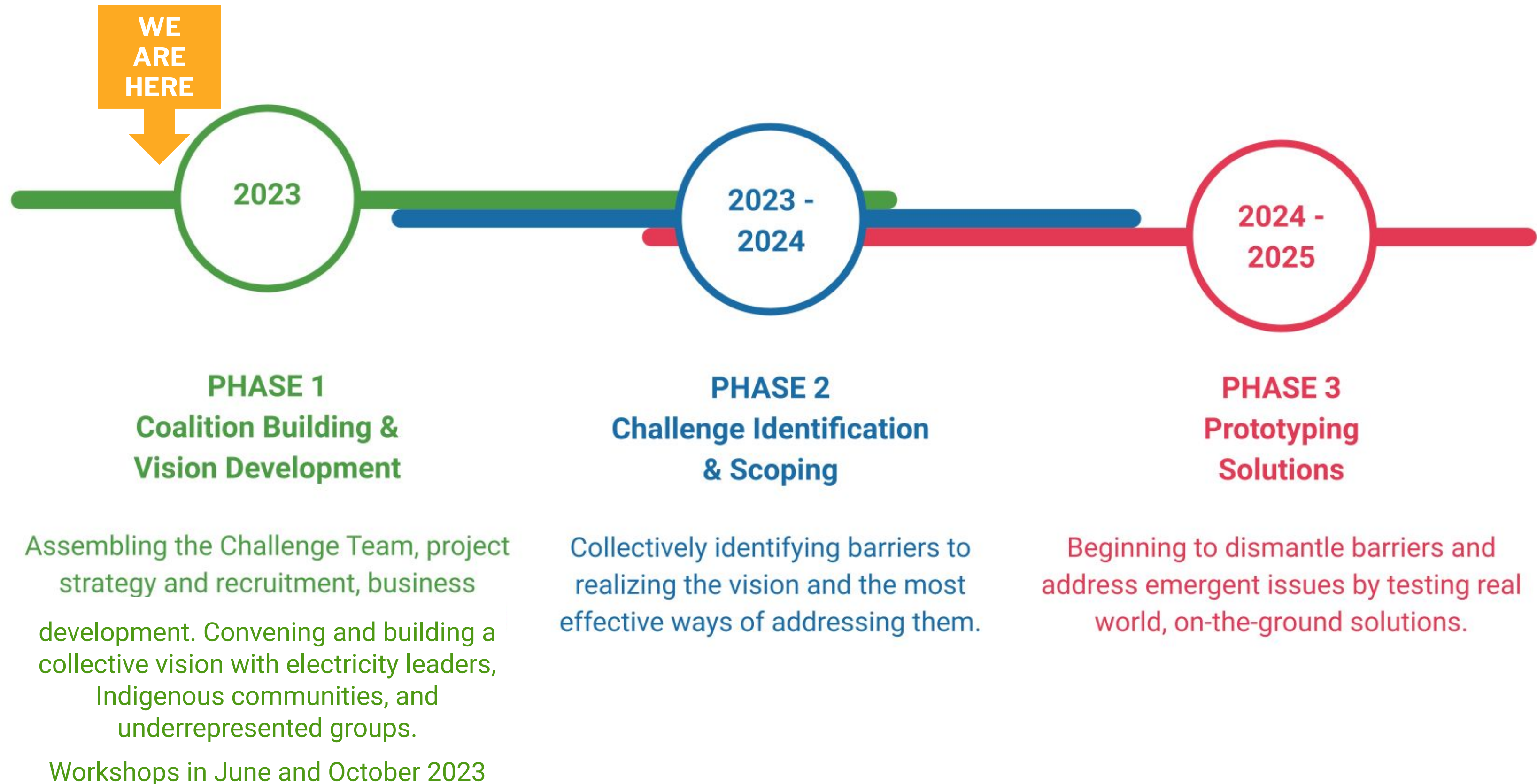


In order to minimize duplication and maximize value, the Energy Futures Lab is collaborating with and connected to other regional and national electricity initiatives.

Our Approach

“Vision without action is merely a dream. Action without vision just passes the time. Vision with action can change the world.” — Joel A. Barker

Our Approach





Our Approach

Amidst a growing imperative to modernize our electricity infrastructure while maintaining affordability, broadening accessibility and achieving a net-zero electricity system, Alberta's Electricity Future (AEF) brings together the perspective, participants, and process required to ensure that our electricity system is set up to power Alberta's prosperity in the decades to come.

In situations of unpredictable change, often the problem is not a scarcity of options and possibilities, but rather a glut - too many to evaluate properly. This prompts some to dive straight into action, trying to address the “how” of fixing the situation. However, these efforts are rarely effective. More often, they result in entirely new problems on top of the one they were originally trying to solve. This is because the underlying issues are often complex, nuanced and interconnected, and can only be addressed if they are understood and treated as a system. The AEF approach uses this fundamental understanding as a foundation of its design.

We need to think slow to move fast. Creating a net-zero electricity system is more than just enabling more low-carbon generation sources. The future system must also respond to evolving roles and expectations of different actors. AEF places the realities and experiences of consumers at the center of this effort, regardless of where they sit in the value chain. A collectively defined vision of our desired future is the first critical step in the journey - to serve as our north star as we navigate the complexities of ‘how’.

In **Phase 1**, we are focused on developing relationships and trust, with electricity leaders, Indigenous communities, and other under-represented groups to gain a shared understanding of the many perspectives across the electricity system. This will ensure the co-created vision is representative of all involved parties and evolving consumer dynamics in an Alberta-specific context.

In **Phase 2**, AEF participants will zoom into and prioritize the barriers to achieving the vision. We anticipate these barriers will touch on policy, regulations, markets, consumer engagement, technology integration and financing.

Phase 3 will focus on building out solution areas - understanding and prioritizing where and how, specifically, we need to work to advance the most important and urgent solutions, and prototyping, piloting, and scaling them. This will include a second round of participant recruitment to dive deeper into specialized solution areas and build out the expert teams who can enact needed change. The approach is phased and iterative so that learnings can be incorporated and used to enhance and accelerate prototyping.

Why now? Why this?

“The power of solutions lies primarily in the people who believe in and own them.” — V. Srinavas

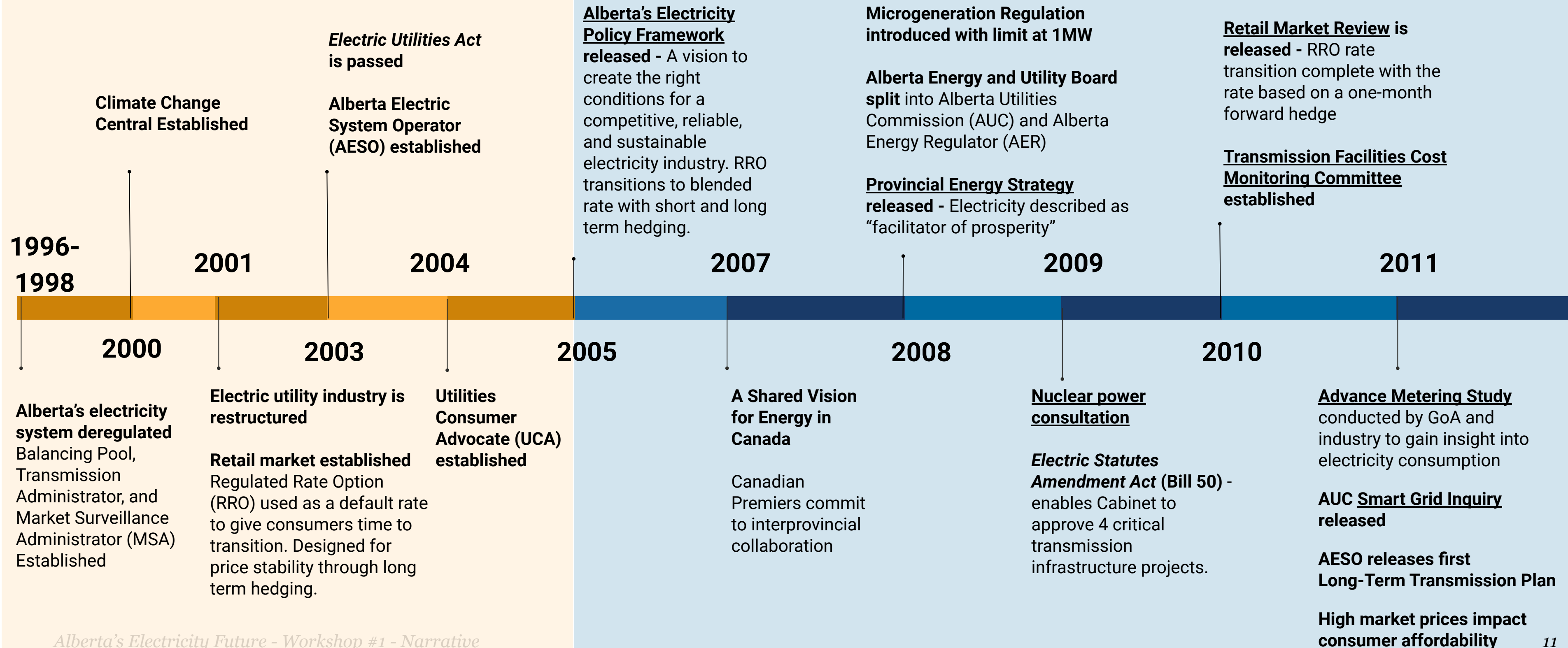
The following section was developed by EFL based on learnings from the workshop and our understanding of the electricity system. We invite your feedback so we can continue to collectively refine the importance of this initiative.



Alberta's Electricity System - Milestones

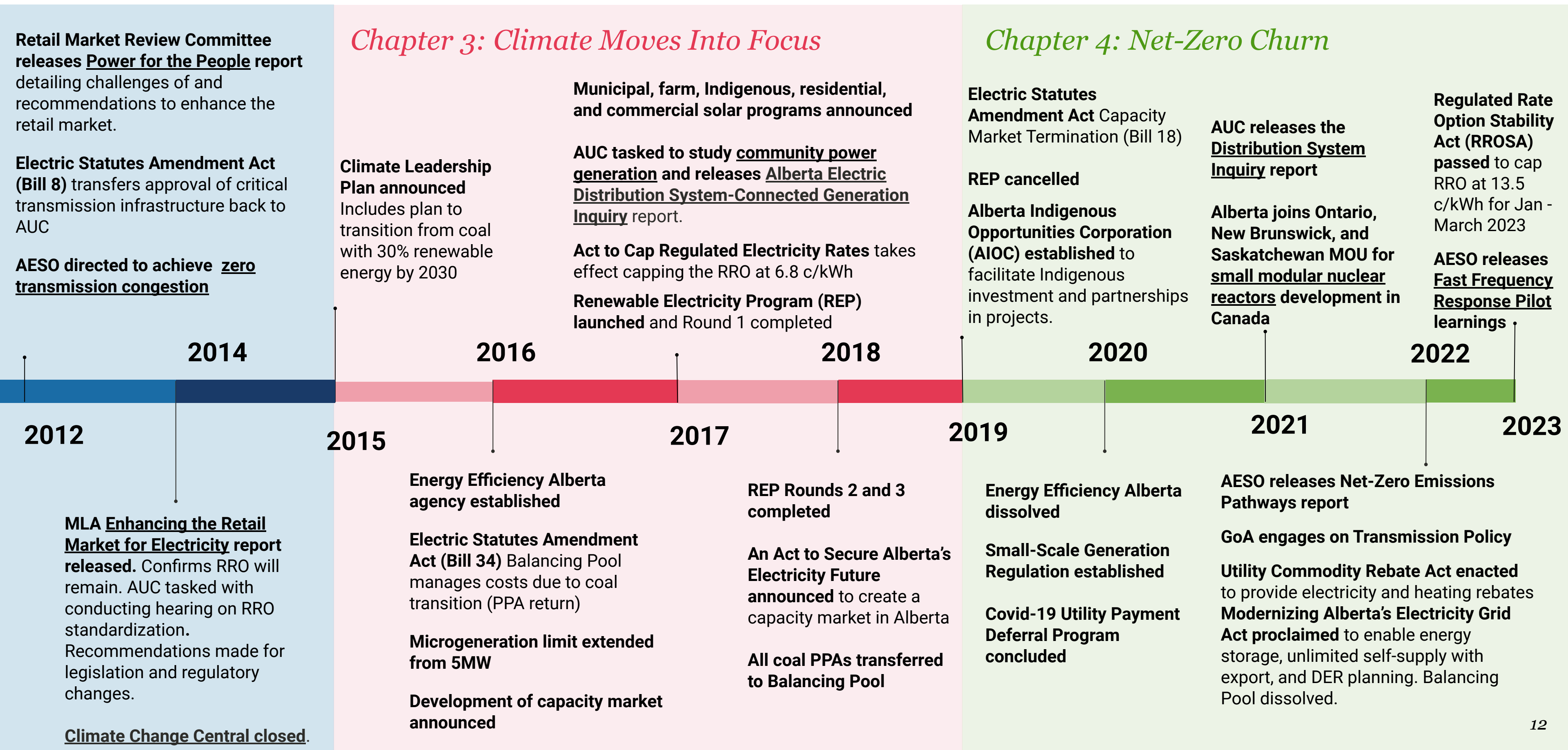
Chapter 1: A New Regime

Chapter 2: Transitioning and Refining





Alberta's Electricity System - Milestones



Why Now?

As consensus has grown around the imperative to reach Canada's net-zero goals by 2050, **four principle dynamics** have been playing out in Alberta's electricity system and making the need for an integrated, system-wide rethink more urgent than ever. The net zero future also presents a great opportunity to meaningfully include and partner with Indigenous communities.

A SYSTEM OUT OF SYNC

When Alberta's electricity system was deregulated in the 2000s, it was **designed for a coal-dominated generation fleet and baseload industrial demand**. Today, coal makes up 12% of total generation with renewable energy being 13%. Natural gas is the dominant fuel source contributing to 73% of generation.

To move towards net-zero in Canada, the Federal government is expected to release

the **Clean Electricity Regulation** (CER) this year. The CER will regulate emissions from fossil-fuel generation by setting performance standards to a stringent, near-zero value. This will impact Alberta's natural gas generation and signal more renewable energy development. The Alberta Electric System Operator (AESO)'s 2023 Long Term Outlook (LTO) draft modelling forecasts **renewable energy will reach 34 percent of generation by 2030**. Alberta's generation mix is fundamentally changing and we need to ensure the wholesale market is providing the right signals to attract the necessary investment.

The Market Surveillance Administrator (MSA) notes in Q1 2023 wind and solar generation increased to record levels. This resulted in a change in the net demand profile (net demand is demand minus wind and solar generation). This change in net

demand, which will continue to increase with more wind and solar, is likely to result in higher system ramping requirements, more thermal generation capacity being offline, and larger wind and solar forecast errors occurring more often.

AESO acknowledged the need for change in their June 2023 Stakeholder Symposium. They launched their Market Pathway engagement to explore the necessary market design changes required to maintain supply adequacy and reliability as Alberta's generation fleet continues to decarbonize.

In addition to generation changes, we are also seeing demand changes. AESO demonstrated in the 2023 LTO draft modelling that **consumer trends are shifting the load profile from primarily industrial baseload to more variable loads,**

Why Now?

with daily fluctuations. This is due to decarbonization technologies' proliferation (including EVs and distributed solar.)

SYSTEM VOLATILITY TIED TO ELECTRICITY AFFORDABILITY

In 2001, Alberta's competitive retail market was established, allowing consumers to choose their electricity from a number of different sources and for different lengths of time. Competitive retailers offer a mix of fixed or variable contracts, as well as other distinguishing attributes like green energy.

For residential, farm, and small consumers who do not select a competitive retailer, they are provided electricity through the distribution company in their area at the default rate call the Regulated Rate Option (RRO). FortisAlberta and ATCO Electric have contracted with EPCOR and Direct Energy,

respectively to provide the RRO in their service territories. The RRO fluctuates monthly based on the wholesale market price.

The MSA estimates **35% of Alberta households are served by the RRO.**

The volatility in the wholesale market translates into increased uncertainty and higher risk in the forward market. Since the monthly RRO is based on the forward market, RRO prices have increased significantly. The MSA reported the RRO rates in Q4 2022 (an average of 19.84 cents/kWh) were 25% and 73% higher than Q3 2022 and Q4 2021, respectively.

To protect consumers from the price spikes, the Alberta Government passed the Regulated Rate Option Stability Act (RROSA) placing a price cap of 13.5 cents/kWh on the

RRO for January, February, and March 2023. Any costs above the 13.5 cent price cap were deferred until April 2023 and repaid over 21 months. According to the Utilities Consumer Advocate, the RRO reached its highest price in February at around 32 cents/kWh.

Present and past Alberta Governments have used their ability to cap the RRO to reduce the impact on price volatility for residential, rural, and small consumers. Capping the RRO has the unintended consequence of creating uncertainty and higher risk for competitive retailers, hindering a true competitive retail market.

The Power for the People retail market review, completed in 2012, recommended a phasing out of the RRO to enable a more innovative, cost efficient, and dynamic retail market.

Why Now?

INCREASING INFRASTRUCTURE COSTS AND CONSTRAINTS

Further complicating matters, the **Transmission Regulation is expiring in 2023**. This regulation has not been updated since deregulation and is no longer in line with the broader system realities and needs. The regulation places the onus of transmission system construction costs on consumers, with no requirements, incentives, or signals to ensure transmission facilities are utilized to the full potential. The locational signals to incent new generators to use the existing system is not strong enough to minimize new transmission build out.

Without requiring, incentivizing, or signaling new, low-carbon generation to build where existing capacity exists and changing who pays for transmission build out, transmission costs will increase, resulting in higher consumer costs.

On the distribution system side, we are **beginning to see the impact of distributed energy resources**, such as rooftop solar and EV adoption. ENMAX Power and FortisAlberta have both launched EV charging pilots to gain a better understanding of consumer charging behavior and its impact on the grid. ENMAX noted that, without incentives, 80% of EV charging occurs at 5 p.m., when electricity demand on the grid is highest.

If traditional business models are used (i.e. installing and upgrading more wires and poles) consumer costs will increase. If, on the other hand, the regulatory environment enables new business models, such as non-wires solutions, demand response, energy efficiency supports, and other demand side management opportunities, it may serve to lessen the costs passed on to consumers.

AFFORDABILITY AT THE FOREFRONT

In Alberta, it is estimated that 1 in 5 households is experiencing energy poverty

and racialized and Indigenous households are significantly more likely to be affected. Due to a lack of metering technology, rate structures, and price signals, not all consumers have the ability to shift their consumption patterns or behaviours to reduce their electricity consumption costs and other fees.

Electricity consumers do not currently understand the trade-offs involved in their electricity service choices - that switching to a different retailer does not affect the reliability of the electricity delivered, their access to trusted information, ability to compare different products and services, or receive a better explanation of costs.

All of these system signals are telling us we need to start making changes. And these **changes need to be at a system-level**, not at the edges, as siloed changes may have significant unintended consequences for other system actors, and risk destabilizing an already-stretched system.

Outcome Summary

The EFL asked workshop participants to approach the day from four consumer lenses; Residential, Industrial, Commercial, and Remote/Rural.

Shared in the understanding that a future system cannot be realized through incremental change, workshop participants took the first steps towards identifying the desired characteristics of a future system.

Why four lenses?

In most provinces, electricity demand stems primarily from residential consumer usage. However in Alberta, industrial consumers drive the lion's share of demand, with residential consumers making up just ~20%.

Based on this, some may ask why we need to equally consider the perspectives of all four consumer segments. Current regulation dictates that consumers connected to the system must pay for transmission and distribution build out. Many large industrial consumers generate their own electricity and therefore avoid paying these costs. This means the majority of system costs are borne by residential, rural, commercial, institutional, and small industrial consumers. **We believe the future system needs to be equitable and consider all voices to ensure no one is left behind.**

This is why the AEF approach focuses on co-creating a vision that considers and represents four, interconnected consumer lenses:



Industrial



Commercial



Residential



Rural/Remote

Indigenous communities, those struggling with energy poverty, and other underrepresented voices are being engaged to participate directly in the workshops and through parallel pathways to ensure these perspectives are considered and their perspectives and concerns are incorporated.

We consulted on whether a separate Indigenous lens was appropriate, however, folks felt it needed to be incorporated holistically within the four lens approach. In reframing Alberta's electrification challenge by putting consumers at the center, the risks to continuing to make siloed, small-scale, adjustments come into focus.

Potential risks include:

- The US Inflation Reduction Act and incentives raise big questions for Alberta's competitiveness in renewable markets;
- Uncertainty and perceived higher risk in the wholesale market will continue to cause higher retail market prices impacting consumer affordability; and
- Consumer costs for both usage and infrastructure will continue to increase with few options to avoid costs, at a time when needs and expectations are evolving.
- Lack of Indigenous community support and partnership on projects.

Such things cannot be fully addressed by optimizing the existing system. The articulated From-To statements are reflective of where we are in the early stages of the initiative. They're useful in identifying the overarching shifts needed and degree of change required for an effective transition and will serve as the scaffolding for continuing to build out an aligned vision as we head into Workshop #2.



From → To

Global shifts

Misalignment - A province uncertain of its path towards alignment with global decarbonization trends.



Proactive - A province creating certainty and actively building alignment on climate change.

Policy & Regulation

Constraining - Policy and regulation as a decelerator for augmenting or transforming electricity generation and usage.



Agile - Policy and regulation viewed as an accelerator for innovation, enabling options for all customers.

Roles

Distinct - Actors have and perform distinct roles within a traditional utility business model.



Overlapping - Increased role for all actors, including end-consumers to provide energy, capacity and flexible services that were once the exclusive domain of utilities.

Infrastructure

Linear - High-cost, locked-in capital infrastructure that provides one-way delivery of electricity - from centralised generators to the rest of the system (high risk of stranded assets.)



Dynamic - Nimble, distributed and networked solutions that enable dynamic, multi-directional flows (lower risk of stranded assets.)

Business Model

Providing Products - A system based on the sale of products and units with limited incentives for producers to improve their products.



Providing Services - A system based on the sale and provision of consumer-driven products and services (i.e. characterized by service markets) that nurtures new entrepreneurship and business models.

Affordability

Extreme Volatility - Volatile electricity rates unevenly experienced by customers, partly due to a knowledge-poor environment.



Predictability - Predictable, equitable rates regardless of where you live or operate in the province, due to a more consumer-focused, competitive retail market and better consumer knowledge and options.

Connectivity

Mainly Islanded - A province that is primarily self-sufficient in electricity, independently designed and operated.



Interconnected - Electricity innovation through greater interjurisdictional cooperation, imports and exports.

Technology

Limited Deployment - Prescriptive requirements and obligations for companies on what tech they can use to meet system needs.



Broad Adoption - Rules that create appropriate flexibility for companies to innovate on how best to achieve desired objectives while mitigating harm.

Current Perspectives

Getting shared on the nature of the challenges facing people and organizations on all sides of the system, and the ideas, attitudes, and beliefs shaping our understanding of what is both possible and desirable.

The current perspectives is based on input from the workshop participants.

Current Perspective: Tailwinds and Headwinds

*In any system that is not operating in perfect equilibrium, actors from all parts of the system experience both **tailwinds** and **headwinds**.*

TAILWINDS

forces, trends, and activities driving, accelerating or amplifying momentum away from business-as-usual

HEADWINDS

forces, trends, and activities that work or may work to preserve the status quo or slow down change

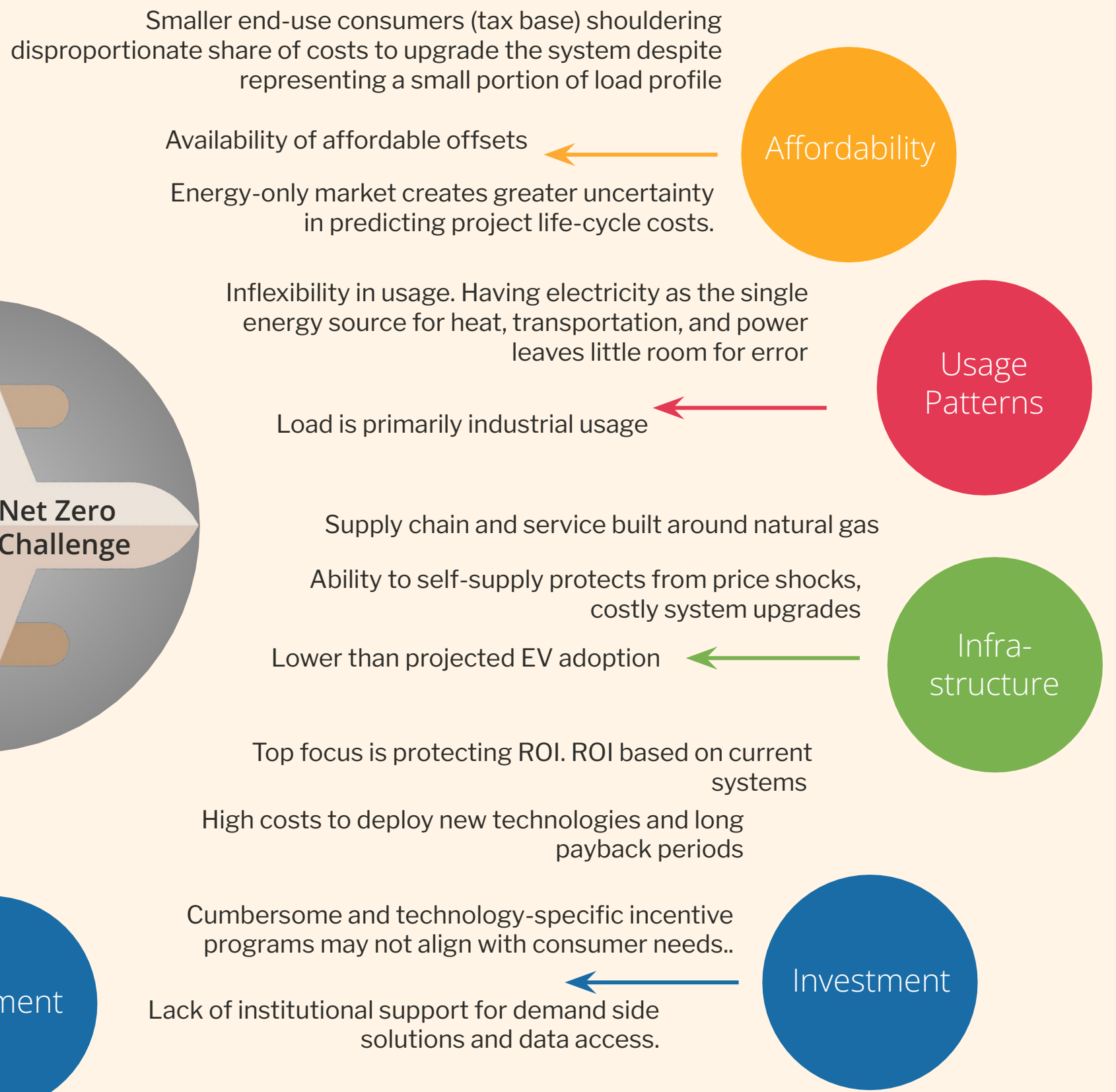
In Alberta's electricity system, not every consumer segment is experiencing the same systemic forces creating either the momentum for change or resistance to it, but taken together, patterns begin to emerge that point to core areas that merit further consideration and investigation.

The following slide is a summary of core themes shared across the four consumer segments and specific examples of drivers that emerged during the workshop. The table on slide 23 provides a list of important drivers that are unique to each segment.

→ **(TAILWINDS) ... are helping to accelerate a transition to net zero electricity**



(HEADWINDS) ... are slowing and hindering a transition to net zero electricity ←





Current State: Alberta Consumers at a Glance

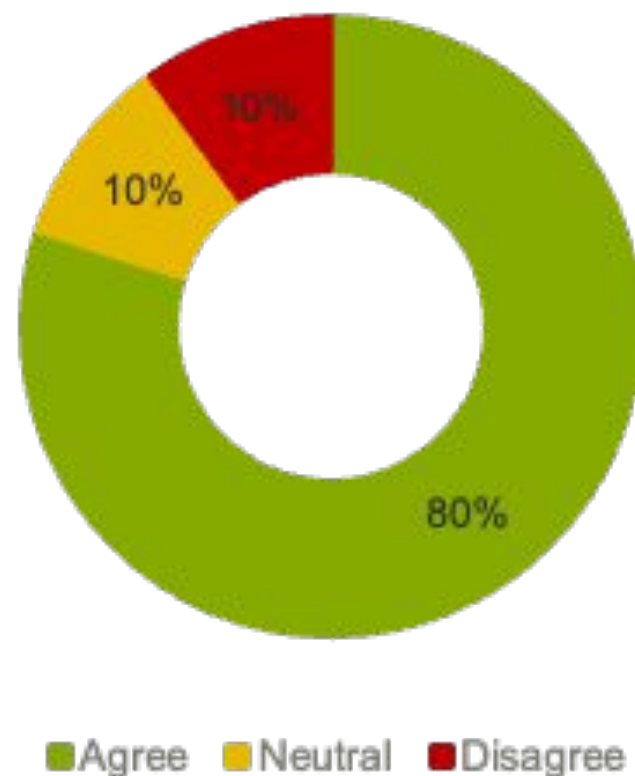
Unique realities shaping the experience of individual consumer segments

Industrial Consumers	Commercial Consumers	Residential Consumers	Rural and Remote Consumers
<ul style="list-style-type: none">● Competition matters: the goal posts on the changes and pace required of industry are shifting at a global level. To remain competitive, there is a need for harmonization of regional and global policy. The disconnect between jurisdictions in Canada is costing us opportunities. Remaining status quo is becoming risky, especially with increasing demand for decarbonized products to compete with the US.● Drivers and needs for small, medium, and large industrials will differ. For example, many industrial players are committed to co-gen and not all know of or can afford the opportunities to reduce energy use while maintaining production. There is, however, some alignment in the increasing view on customer and investor values and social license.● We need new, potentially creative rate design, to better reflect overall system costs and avoid grid defection.	<ul style="list-style-type: none">● Consumers in this segment are competing for capital investment in a global market. Any changes should seek to increase appeal and value for investors taking a global lens to decide where they put their money.● Capital investments are required to reduce carbon emissions with minimal incentives or programs available to support consumers.● The needs and wants of commercial consumers varies greatly depending on their scale, so market design should be flexible to allow the greatest share to participate.● Commercial consumers are becoming more aware of different opportunities available to them, and more informed about energy types and uses. The opportunity for buildings to be both an electricity producer and consumer will require more integration of demand side management tools and resources to assist in making the business case.	<ul style="list-style-type: none">● Affordability is a complex issue. It needs to be addressed by affordable supply and delivery costs, demand-side management, and consumer choice informed by proper pricing signals. However, not everyone has the ability to choose. To account for this, different mechanisms will be needed for lower income and underrepresented consumers.● The cost to achieve net zero is very contentious. We need to better understand the holistic energy and social costs (including transportation, heating, and electricity) and determine how to pay for them as a society. Simply putting these costs on customer utility bills will not be acceptable.● Choice and pricing mechanisms need to be easy, accessible, and economic for broad adoption.	<ul style="list-style-type: none">● Rural and remote consumers value interdependence, and favour the ability to support each other and neighbouring communities through more decentralized solutions.● Rural and remote consumers approach transition from a longer lens on the future - considering the impact of decisions at 100 years or 7 generations out, not just the typical 10-20 year “long-term” time frame.● There is competition for land use and zoning between net-zero energy solutions and agriculture.● Energy transition is seen as a political ideology aligned with one side of the spectrum and misalignment with regional politics creates misgivings about the value of transitioning the energy system without a deeper understanding of what is at stake.

Current Perspective: Alignment on the Challenge

Ahead of Workshop #1, participant interviews revealed existing areas of alignment among consumer segments, most notably on the goal of net-zero.

Is net-zero electricity a goal for Alberta?



Consistent themes between segments:

1. Net-zero must be a goal of system change.

80% of challenge participants agreed on this point, revealing greater-than-anticipated alignment on both the need for this challenge and the importance of net-zero in the vision of a future system.

2. There is a mismatch between the current design of the system and the realities of how it's being used (and a widening gulf with how it will be used in the future.)

Decisions made 20 years ago during deregulation aren't relevant for the future system. New markets, tools, pricing mechanisms, regulations and rate structures are needed.

3. We're looking at affordability all wrong.

To convey the possibility for a future grid to be more affordable, messaging needs to focus on holistic energy costs (which includes transportation, heat, and electricity). There is a risk in decoupling electricity from holistic energy costs. All-in energy costs do not necessarily increase in a low carbon/net-zero future.

4. Prosumers are here to stay, and help extend the capacity of the system. We should be supporting them.

There is increasing interest in consumers taking on the dual role of producing and consuming electricity. Their ability to participate needs to be automatic and easy on the residential and small commercial side. Greater demand-side management and pricing signals are needed to facilitate broader adoption.

Barriers to Change

Addressing different challenges requires varying degrees of effort and results in varying degrees of impact. We think of these on a spectrum from **stumbling blocks** (low impact, low effort), to **hurdles** (high impact, low effort), to **barricades** (high impact, high effort). There is value in solving challenges in each category, but to make significant change requires building the collective capacity to take on barricades, which hold the greatest potential for system-shifting impact.

The following slides summarize the **hurdles** and **barricades** identified by the workshop participants.

Barriers to Change

Hurdles

(LOWER EFFORT / HIGH IMPACT)

- **Outdated laws and regulations**
 - Land use laws originally designed for agricultural development don't easily facilitate renewable energy projects
 - Provincial regulatory process and data access required to incent innovation in demand-side management
 - Energy efficiency solutions not seen as a priority
- **Market rules not set up to handle complexity of modern technologies**
 - Market access lacking for alternative solutions, including net-zero technologies, and new market entrants
 - Alberta competitiveness for global renewable investment is lagging other jurisdictions (e.g. for aggregators, grid storage)

- **Problems with siloed funding and incentive programs**
 - Inequities in access to programs
 - Programs prescribe solutions instead of enabling choice to meet consumer challenges
- **Lack of education and training opportunities in energy transition for the next generation of the workforce**
 - Lack of labour available to realize grid modernization at scale
 - False perception exists of having to choose between traditional energy and net-zero renewables
- **Outdated planning approaches**
 - Current planning and modelling are based on a traditional system
- **Outdated and siloed standards and codes**
 - Buildings are not currently designed or built for distributed generation or to have high energy efficiency levels

- Building codes have minimal performance thresholds and carbon emissions requirements
- Emergent technologies are competing for market dominance - therefore, no standards exist for interoperability

Barricades

(HIGHER EFFORT / HIGH IMPACT)

- **Lack of alignment between different levels of policy makers (federal, provincial, municipal, Indigenous)**
 - Lack of long term stability (governments change every 4 years and so do their policies)
 - Big, short-term subsidies boost the local economy but are not sustainable. Long-term policy, market design, and regulatory change is needed.
 - A perceived need for "Made in Alberta" solutions prevents collaboration and leads to automatic rejection of ideas coming from outside (Alberta vs. the world thinking)

Barriers to Change

- The association of energy transition with a particular political ideology has made any transition effort feel like an assault on other political identities
- **Focus on special / individual interests**
 - A single focus on preserving a natural gas economy stalls advancements of other technologies. Natural gas is currently the largest source of electricity supply, so lack of policy on the future of natural gas creates uncertainty and increased costs.
 - Real collaboration can be difficult when there is a perceived threat to current business
 - Fear of losing high-paying jobs through the energy transition
- **Lack of understanding and perceived benefit of net-zero value chain**
 - Sustainability standards are slow to be adopted and benefits are not fully understood or seen as desirable (only the downside feels tangible)
- Demand for net-zero technology is currently stifled by limited market choices and supply in Alberta (access to knowledge, suppliers, supply chain to select, install, and operate new technologies is still patchy)
- **Conflicting objectives between market segments and regulated segments**
 - New technology is being developed and piloted faster than regulatory and policy frameworks are updated, which impedes broader development
 - Need more technology advancement and innovation to accelerate transition
 - Availability and ease of access to new technology is sometimes limited or delayed
 - Electricity planning is top-down and doesn't take into account locational issues and benefits
- **Rising Costs and Challenges to Affordability**
 - The high current cost of delivered electricity is making the need to invest more money to make change a more difficult choice, especially when considering who will bear the costs, how to incentivize tax payers, rate payers, offsets, system, etc.
 - Energy poverty in low-income households and businesses limits financial ability for individuals to invest in alternative energy solutions. However, low-income housing is often the least energy efficient.
 - Inflation and aging buildings are increasing financial pressure on all households and businesses.
 - Cost of the last 10% - i.e. reaching 100% net-zero electricity system versus 90% or having limited flexibility on how the remaining 10% is achieved.
 - Inability to treat electricity supply as an export commodity. For example, forest products, oil and gas, and livestock are economic exports.

Defining Success

Phase I of Alberta's Electricity Future sets out to establish the guard rails for a viable path to a thriving future electricity system, while leaving space for flexibility and maximizing our ability to respond to new challenges and realities that emerge throughout the transition. Doing this helps us maintain cohesion in our direction even as the playing field changes.

The statements on the following slides are based on input from the workshop participants.

Defining Success

*It's no later than 2050.
Alberta has realized a safe,
affordable, reliable, equitable,
net zero electricity system.*

*This is a future where we have
realized the following:*

- **Energy issues are depoliticized**
Collaboration on the energy file has unlocked agreement on long-term strategy (beyond election cycles) and allowed more people to see the benefit in a net-zero grid. It has helped create more stable incentives and the predictable funding environment critical for attracting investment. It has spurred regional innovation based on a deep knowledge of the Alberta system, but also created an openness to collaborative solutions, facilitating a faster, smoother transition thanks to a shared sense of ownership and buy-in.
- **Affordability is defined** and able to be measured so the system can quickly take steps to ensure it is maintained.
- **System actors and consumers are empowered and supported to innovate in predictable, yet flexible, market and regulatory environments.** Long term policy clarity (including land use policy), regulator and utility mandates, and market design that tethers supply and demand have enabled more technology participation and demand side management supports through pricing signals and consumer-centric programs.
- **We have optimized the grid through the application of conservation and efficiency focused technologies,** and we've reached the point where high efficiency homes and buildings are the norm, regardless of income or revenue.

Defining Success

- **Existing and new industries are flourishing and diversified** due to Alberta's net-zero electricity system. Standards for building performance have spurred on creation of a more robust ecosystem for energy services in the building retrofit market. Alberta's products and services are preferred globally due to high sustainability standards and strong Indigenous partnerships.
- **Consumers of all types are empowered to understand their options for meeting their electricity needs** through transparent communications, simplified processes, and greater electricity and energy efficiency literacy. Return on investment is made tangible through personalized and demonstrated value (through access to data.)
- **The system is aligned with the values and needs of future consumers** because underrepresented consumers and the next generation of leaders were engaged in the transition.
- **Energy policy and environmental policy are seen as economic policy**, which has created a system optimized for
 - Flexibility (to allow for innovation)
 - Readiness for mass adoption of new technologies
 - Affordability for all consumers
- **Midterm and final targets were achieved using a variety of approaches**, driven by innovation, technology deployment, and market mechanisms.



Emergent Tensions

Rather than making trade-offs from the outset, by noticing and holding the tensions emerging in our conversations, we believe we can put them to work helping generate more innovative and creative solutions to the challenge at hand.

What follows are the EFL's observations of some tensions we heard in Workshop #1. We will continue to pay attention to these tensions and invite your feedback on them in service of refining and understanding them further.



Emerging Tensions: Individual Segments

Top tensions between the current versus desired system from the POV each consumer segment (as interpreted by the EFL)

Consumer Segment	On the one hand...	Tension	On the other hand...
Rural and remote	Reliability through regional interdependence	Rural and remote consumers value interdependency to support each other and reduce vulnerability through decentralised microgrids versus a system designed to maximize efficiencies through centralization with locational grid services.	Reliability through centralized system
Residential	System-driven change Simple choices make decision to change a 'no-brainer'	There are two schools of thought: one is a perceived need for residential consumers to understand the electricity system and increase electricity literacy to motivate system change. The other is the notion that a successful transition would be characterized by consumers barely noticing the transition and behavioural shifts.	Consumer-driven change Increased energy literacy leads to demand for change
Commercial	Desire to achieve net-zero to protect investment opportunity	Commercial consumers desire to achieve net-zero and address climate-risk versus controlling the increasing costs of products, aging assets, and standard of living due to inflation.	Desire to curb short-term inflation and rising asset costs to keep products reasonably priced and remain in business
Industrial	Letting market forces guide the role of behind the fence natural gas generation Potentially a bumpy ride	Industrial consumers need clarity on the future of natural gas - but will a phase out or decarbonization of natural gas be achieved through an integrated plan for natural gas assets and associated industry versus letting competitive forces sort it out?	Integrated and aligned plan for transitioning behind the fence natural gas generation Potentially smoother, but seen as interfering



Emergent Tensions: A Rural / Urban Divide

The rural-urban divide is particularly acute in Alberta: top tensions between these two consumer segments (as interpreted by the EFL)

Consumer Segment(s)	Perspective	Tension	Perspective	Consumer Segment(s)
Rural and remote	Favour bespoke solutions	Rural and remote consumers want Alberta-made policy versus commercial and industrial consumers who require alignment with global policies and pace of change to remain competitive.	Favour globally aligned solutions	Urban and Industrial
	Fear of repeating historical energy reclamation challenges	Lack of trust from previous energy development and ability to veto leases has the potential to stifle a renewable energy boom	Renewable energy can be repowered and won't require reclamation	
	Energy will compete with agriculture for primacy in land use	Rural and remote customers want to ensure industry contributes to rural economic development	Updated land use policy creates opportunity for net-zero electricity development	
	Focused on improving long-term resilience	Rural and remote consumers are most vulnerable to climate change yet current incentives and investments primarily benefit urban and industrial consumers.	Focused on attracting near-term investment	
	Rationale for shift seen as primarily ideological	Rural and remote consumers feel rationale for decarbonization is primarily ideological, and often misaligned with traditional political representation in their regions (especially in the current Alberta political landscape).	Rationale for shift seen as primarily economic and maintaining competitiveness	



Emergent Tensions: The Cart/Horse Paradox

Top tensions across all consumer segments: drivers for change, timing, and where Alberta wants to be on the net zero adoption curve (as interpreted by the EFL)

On the one hand...	Tension	On the other hand...
Provincial government sensitive to Federal incursion and enforced timelines	Misalignment on net-zero timeline and terminology, i.e. net-zero versus carbon neutrality.	Federal government creating net-zero targets to meet global commitments
Waiting on EVs (risk of system being overwhelmed by unanticipated demand)	EV adoption rate in Alberta is still low, so current risk to the system is minimal. However, global data has illustrated a long history of systems underestimating the pace of technology adoption.	Anticipating EVs (risk of excessive capacity too soon)
Regulated environment incentivizes capital expenditures	Consumers need ease and access to demand side management (DSM) in a regulated environment set up to incentivize increased electricity use supported through capital expenditures.	Non-wires solutions and DSM to incentivize efficiency
Keeping costs low and maintaining short term affordability by maximizing lifespan of existing technology	The actual costs to transition to net-zero technologies, business models and/or services versus forgone opportunity costs of remaining business-as-usual and the impacts of becoming less competitive.	Minimizing opportunity costs and aligning and diversifying economy with new realities
Letting the market drive demand for change (reactive)	Tension between using market forces versus regulation and policies. Existing mandates do not include environmental stewardship or climate change considerations.	Coordinating as a system to minimize shocks as a result of change (proactive)
Semi-competitive retail market that provides a backstop	A government-authorized default retail rate (Regulated Rate Option) that follows the hourly wholesale market designed for generators and that can be capped impacts competitive business strategies and the ability of consumers to understand alternatives.	Robust competitive retail market enabling consumer choice and benefit

The Next Sprint

“We can’t impose our will on a system. We can listen to what the system tells us, and discover how its properties and our values can work together to bring forth something much better than could ever be produced by our will alone.” — Donella H. Meadows

The Next Sprint: Defining A Vision

We must align around a common vision of success so actors in Alberta's electricity system can work synergistically and efficiently to achieve the needed change. The next AEF sprint advances this effort and will express further granularity in the continued buildout of an aligned vision of electricity system players.

In October 2023, Alberta's Electricity Future will reconvene participants to further build out the components of a vision outlined in June. Once complete, the vision will be validated and refined with input from a citizens panel, built to represent diverse voices within Alberta's electricity system, with special focus on Indigenous, low-income and other marginalized voices.

The future belongs to everyone.

The guiding vision around which electricity system players mobilize must be built by representation from the full system. It will be further enhanced with input from **industry and academic experts** to ensure it is truly fit for the future. The final version will be presented to workshop participants in late 2023 / early 2024.

Once we know where we need to go, the real work begins.

Phase 2 of this initiative involves diving more deeply into the challenges and barriers hindering progress toward the established vision. This phase will be developed in collaboration with electricity system players and experts and augmented with research conducted by established academic partners and organizations.

Completion of this phase will provide clear articulation of the most urgent and necessary activities and items to tackle which require a systems approach and a more fulsome understanding of who is most implicated and therefore necessary to involve in addressing these issues.