CHALLENGE STATEMENT #1

Incentivizing the optimization of existing electricity assets and infrastructure

What is the systemic barrier?

We define **optimizing** as transforming the electricity system by first leveraging what already exists. This includes measures to reduce electricity demand and consumption and increase the efficiency of the overall system (not just the efficiency of individual assets), in order to reduce energy costs. Where economically and operationally feasible, optimizing will maximize value of existing investments, minimize stranding infrastructure and reduce electricity costs for customers.

Alberta's transmission and distribution companies (i.e., utilities) play a critical role in deploying infrastructure and assets to deliver electricity to citizens, Rights and Title holders, communities and businesses. While incentives are in place to encourage utilities to find operating efficiencies, few drivers exist to encourage them to optimize existing electricity system assets and infrastructure, or explore solutions that are not seen as capital investments. This results in a preference for new capital expenditures, on which utilities earn a rate of return, over operating costs, which are typically needed for optimization and for which there is no rate of return for utilities. This can lead to underutilized assets and under-realization of broader environmental and social benefits that may come from non-asset based investments.

Factors currently working against optimization include:

- Utilities earn revenue by the amount of electricity they deliver to customers so they have no incentive to encourage solutions, such as energy efficiency and conservation, demand side management, etc., to reduce electricity consumption as part of optimizing the system.
- There is minimal opportunity to earn revenue by using operational solutions when they are equally or more cost-effective than viable capital solutions with similar benefits/outcomes.
- Transmission regulations focused on zero-congestion and cost-allocation to load customers do not encourage generators to connect to the grid in places with excess capacity.

Not enabling more optimization increases the risk of an overbuilt, underutilized and high cost system at a time when the province is facing increasing electrification driven, in part, by a greater emphasis globally on sustainability.

Why is this critical to achieving our vision?

Within Alberta's Electricity Future vision, we have identified affordable, abundant and emissions-free electricity as being critical to maintaining and strengthening Alberta's competitive advantage. A net-zero electricity grid is a key enabler for decarbonizing Alberta's economy and attracting new businesses and industries. Through optimization, we can lower capital investment needs, decrease GHG emissions and other environmental impacts while also expanding supply, and reducing the near- and long-term costs to ratepayers.

Unlocking this barrier moves us towards a system that "delivers more than just electrons" by investing in technologies and services that optimize the existing grid.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved. The following are examples of surface level-barriers that are the result of a system where utilities are largely incented to invest in new infrastructure, not to optimize.

- **Limited availability of demand-side management programs in Alberta**
- **Utilities, retailers and generators' growth in sales is tied to growth in consumer consumption**
- **Non-wires solutions are allowed only to relieve congestion and under specific circumstances**
- **New generation is not strongly incented to connect in areas with existing transmission or distribution capacity**
- **Utilities are not incented to invest in innovative technology solutions**
- **Customers have little ability to reduce their electricity bills through changes in their electricity consumption**
- **There is no distribution policy or direction to optimize**

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CHALLENGE STATEMENT #2

A wholesale market structure that fully recognizes the benefits of diverse supply and demand resources

What is the systemic barrier?

Alberta's wholesale electricity market was created roughly 20 years ago when the majority of electricity generation in the province came from coal-fired power plants. The services and technical rules governing the market were designed with the attributes of coal and natural gas generation in mind. They were also designed to attract and entice investor-owned generation into the province at the outset of deregulation. As renewable energy sources and emerging solutions, such as energy storage have come onto the system, the market design, services and rules need to be adjusted to account for their benefits and limitations.

Even as the 2024 Restructured Energy Market (REM) scope and engagement intends to address supply-side issues that might enable new generation sources and emerging solutions to participate in the market, greater connection to and enhanced participation from the electricity system's demand-side remains a gap. Enabling more demand-side participation in the market can help industrial and commercial customers manage their electricity costs, enabling them to remain competitive, while also making new products and services available to residential customers that allow them to influence their energy bills.

Why is this critical to achieving our vision?

Alberta's Electricity Future (AEF) vision seeks to create a future where the system delivers more than just electrons. It seeks a system where vastly expanded sets of goods and services are created and sold. A service-oriented electricity system will nurture new entrepreneurship and business models, create new efficiencies and potentially even new income streams for customers. To do this, the system must also have the ability to predict, calculate, coordinate and balance demand and supply through inter- and intra-jurisdictional imports and exports, creating resilience in the face of unexpected disruptions.

A fundamental enabler for achieving this is a wholesale market designed to recognize the advantages offered by new generation sources, energy storage solutions, and demand side management, and be adaptable to incorporating emerging solutions as they become

commercially available. A wholesale market designed to properly assess and value the benefits of demand side management and emerging solutions inline with the AEF vision is critical to establishing Alberta as a destination for innovators, investors and businesses focused on delivering a greater diversity of electricity solutions.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved.

The following are examples of surface level-barriers that are the result of a wholesale market not enabled to fully recognize the benefits of emerging solutions.

- **More regular electricity system blackout notifications**
- **More zero-priced hours, making it harder for generators to recover their costs**
- **Difficulty in coordinating a growing number of small-scale resources whose market participation differs from large generators**
- **Lack of market incentives to optimize the grid and deploy new technologies**
- **Difficulty in building complete business cases for new resources, products, services, and expanding interties**
- **Lack of investor confidence in the stability of the market to deploy new generation**
- **Economic growth constraints due to lack of abundant clean, affordable, reliable electricity to fuel future companies**
- **Market rules limit participation from new entrants**

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CHALLENGE STATEMENT #3

Indigenous engagement / Indigenous-led projects are key to electricity expansion

What is the systemic barrier?

Historically, Indigenous communities have been engaged in the development of electricity projects only when these projects have impacted or run through Reserve land. Further, this engagement on projects has typically followed colonial models for decision-making that have limited the ability of Indigenous communities to share broadly in the benefits of major electricity infrastructure projects. Specifically, Indigenous communities have typically been denied equity ownership on electricity developments on or proposed developments within their traditional territories or Reserve land; been prevented through the *Indian Act* to leverage existing assets for loans or to access reasonable and competitive capital to develop their own power projects; and, Indigenous nations are still building the capacity to develop such projects should opportunities arise.

Why is this critical to achieving our vision?

With the exception of the National Parks, all of Alberta falls under Treaty agreements. There is no road to an expanded electricity system that does not pass through Indigenous territory. On the one hand, the electricity system and connecting infrastructure must be expanded to meet both growing and changing demand and contribute to a net-zero future. On the other hand, there is a growing potential that Treaty law will be recognized and respected, meaning that potentially all land and its use in Alberta will be subject to review through the lens of Treaty rights. Additionally, increased Indigenous ownership levels in Canada have been generating a range of benefits for major projects, including "reduced regulatory risk, accelerated permit approvals, improved communications channels, and better long-term alignment of interests between industry and Indigenous [nations]."[1] The evolving electricity system must aim to further build on these benefits.

Indigenous communities must be engaged as equal partners in any decision-making that broaches any aspect of their rights under Treaty, or involves land governed by it. Failing to do so may result not only in Indigenous communities opposing projects that encroach on their

[1] P. 26 https://fnmpc.ca/wp-content/uploads/FNMPC_National_Electrification_digital_final_04222024.pdf

traditional territories and/or which do not offer mutual benefit to affected communities, but also fail to honour the Truth and Reconciliation Commission's (TRC) Calls to Action.

This is directly correlated to three core principles of Alberta's Electricity Future vision, including: facilitating equity, adapting to change and diversifying solutions, leading to growing economic opportunities, investor confidence and creating jobs for the benefit of the many, including (and in some cases especially) Indigenous communities.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved.

The following are examples of surface level-barriers that are the result of a system that does not prioritize Indigenous engagement/Indigenous led projects:

- **Outdated and colonial approaches to engaging with Indigenous communities on power projects**
- **Lack of access to competitive capital for Indigenous communities to participate in projects**
- **Lack of capacity within Indigenous communities to construct, operate and maintain clean electricity projects, particularly in remote areas**
- **Opposition of infrastructure projects on Indigenous land due to lack of mutual benefits**

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CHALLENGE STATEMENT #4

Frameworks and governance structures that reflect evolving climate realities

What is the systemic barrier?

In 2023, the Alberta government released their *Emissions Reduction and Energy Development Plan*, which includes a stated aspiration to achieve a carbon neutral economy by 2050. While such policy frameworks are essential for signally intent and overarching policy direction for the industrial sectors in the province, it has not yet been translated into specific mandates for the electricity regulator or the system operator to ensure these objectives are driving (or at least factored into) generators' or utilities' planning and decision making. As a result, generators, utilities, the regulator and the system operator may be prevented from ensuring the investments, decisions and rules they make or approve are consistent with the government's stated, long-term climate goals. This increases the risk of making decisions now that, by virtue of long implementation periods, can exponentially limit needed progress on decarbonization while continuing to create policy uncertainty and erode Alberta's appeal as a destination for investment and business innovation.

Why is this critical to achieving our vision?

Alberta's Electricity Future vision seeks a future-oriented electricity system that requires policy to be an accelerant and catalyst. This can then help to enable the creation and sale of a vastly expanded set of goods and services; enable and enhance multi-directional connections between neighbours, communities, regions, provinces and across international borders; and maintain and strengthen Alberta's competitive advantage through affordable, emissions-free electricity.

To achieve this, both the regulated and deregulated parts of Alberta's electricity system must have decarbonization as a strategic objective. They must also prioritize innovation as a way to balance the costs of decarbonization with the benefits it will provide. Without clear mandates that set this is out specifically as an objective of regulators and system operators in the electricity system, such entities will be limited in changes they can make within the relatively narrow scope of their roles and responsibilities. This is because these entities have been established largely to implement policy direction, and are therefore not in a position to anticipate what future policies could or should look like.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved.

The following are examples of surface level-barriers for electricity system transformation that are the result of provincial frameworks and governance structures currently being limited in how they reflect climate realities:

- **There is insufficient strategic and net-zero-aligned energy planning across all system actors**
- **Utilities and service providers are hamstrung in providing decarbonization solutions and regulators can not support or incent decarbonization solutions without clear direction from government**
- **Narrow authority and prescriptive mandates for regulators and utilities**
- **Climate change and energy transition are actively being used to polarize perspective towards political ends**
- **Insufficient information is available to provide clarity around the availability of financial incentives and their usefulness in attracting low-cost capital for transition projects**
- **Limited expertise and resourcing are available to support regulatory innovation, resulting in regulations being unable to keep pace with technological advances**

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CHALLENGE STATEMENT #5

Minimizing stranded assets as the electricity system evolves

What is the systemic barrier?

From power plants to wires and substations to customer meters, electricity system infrastructure have a built-in lifespan upwards of 20 to 40 years. In Alberta, power plants are paid off over a period of time through revenue generated within the electricity market, transmission and distribution infrastructure are paid off through the rates they collect from their customers. These assets become stranded when they still have remaining lifespan, but no longer earn a return on investment, due either to economic factors (e.g. market dynamics make the asset too expensive to operate profitably) or regulatory factors (e.g. policy interventions limit demand or preemptively curtail the asset's use).

As Alberta transitions to a net-zero electricity grid there is a possibility that some traditional electricity infrastructure (eg. power plants, wires, substations, etc.) may become stranded due to decarbonization policies, increasingly frequent and severe weather events such as wildfires, or alternative technical solutions coming online. The potential of stranded assets has significant implications, in particular from an economic and liabilities perspective. Transmission and distribution companies may shy away from attracting and deploying new and disruptive innovations that move the electricity system toward net-zero if they also increase the potential of stranding existing assets. This may limit the degree and speed by which the system overall will change.

Why is this critical to achieving our vision?

Electricity planning has a time horizon of decades and decisions made today have a material impact on our ability to make the shifts needed to achieve the vision we've set as our North Star. However, even if a new resource, business model, or technology that reduces overall electricity system costs and demonstrates additional benefits were to become available, it may face resistance if its implementation undermines the economics of previous investments. To avoid this, any solutions seeking to address this issue must involve a larger cultural change.

To align with Alberta's Electricity Future Vision's principles of diversifying solutions, embracing environmental integrity and adapting to change, we must provide players in a

deregulated system clarity on how assets at risk of obsolescence under a new electricity paradigm might effectively be wound down, repurposed or transformed.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved.

The following are examples of surface level-barriers given the financial risk of stranded assets as the electricity system continues to evolve:

- **Investor confidence is diminished by uncertainty over future Federal Clean Electricity Regulations and resulting targets**
- **Uncertainty over new regulations is causing capital to flee to other markets**
- **Complicated, overlapping, unpredictable and rapidly-shifting policy prevents credible investment modeling**
- **Businesses are struggling to make a case for investment in decarbonization due to lack of data**
- **Integrating distributed energy resources (DERs) may cause stranded assets, increasing the perception of DERs as a threat to current business models**
- **Regulatory decisions don't historically favour shortening amortization (asset life) of capital investments to align with higher pace turnover in technology assets. (e.g. smart meters)**

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CHALLENGE STATEMENT #6

Tailored electricity programs and services to reduce energy poverty

What is the systemic barrier?

'One-size-fits-all' electricity cost reduction programs, rebates and services may create barriers that disadvantage many of Alberta's most vulnerable and marginalized people. While intended to streamline participation, a one-size fits all design may create burdensome processes, financial barriers, and accessibility issues. Taken together, this leads to inequities that hinder potential beneficiaries' ability to participate in programs, rebates or services designed for them. Such inequities include uneven disbursement of resources and program support/funding; increased proportion of system costs for customers who can not afford to install distributed energy resources; and an entrenched reliance on existing electricity sources for those who can not/do not access the programs.

For such programs and services to be effective, they need to take into account different customer needs, regional opportunities or barriers, and the resourcing and skill sets required to deliver and sustain them. This is difficult, time consuming, and costly to do. However, if one-size-fits-all programs, rebates and services continue to be the norm, only those privileged by bias inherent in the design will be able to access their benefits, to the further detriment of other groups. This can only serve to widen gaps between economic groups, create further inequity and increase the number of people living in energy poverty.

Why is this critical to achieving our vision?

At its heart, Alberta's Electricity Future vision is intended to make customers of all kinds visible and centred within the electricity system. One of its core principles is 'facilitating equity' through balancing the cost of achieving net-zero electricity between ratepayers and taxpayers, and ensuring an equitable distribution of benefits. When a household spends 6% or more of their income on home energy needs, they are considered to be living in energy poverty. Currently 1 in 5 Albertans meet that definition, and not all those experiencing energy poverty are considered 'low income'. For a prosperous society that believes in the dignity and worth of all people, this is unacceptable. Energy poverty also increases costs to other parts of a public system, including through bigger and more frequent draws on the

healthcare system. We must make the provision of affordable and accessible electricity to all people in Alberta a metric of success that the whole system is accountable to. While this is a complex undertaking, we can begin to address it by removing barriers that lock in a 'one-size-fits-all' approach to solutions, choices, and supports, enabling a more robust and resilient system.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved. The following are examples of surface level-barriers given a system characterized by one-size fit all programs, rebates and services:

- **High upfront costs and poorly communicated benefits for energy home improvements and rooftop solar installations make it difficult for people with limited income and time to participate**
- **Poor credit history and security deposit requirements can limit access to affordable services**
- **Limited funding for programs restricts public awareness of their availability, understanding of eligibility requirements or exclusions, and knowledge of how to stack applications to maximize their benefit.**
- **Program information and application processes are not accessible to all intended audiences (language supports beyond English/French are not always available, exclusively online applications require internet connection, etc.)**
- **Renters have limited agency to participate in programs if landlords are not willing to make improvements.**
- **Eligibility criteria for energy poverty support programs exclude certain people who require support: most eligibility requirements consider household income, but income is not the only indicator of energy poverty**
- **Rebate programs often don't consider income or energy poverty criteria in their determination of eligibility or consideration of benefit amounts**
- **Rate of Last Resort (default rate) is not the cheapest rate, and yet it applies primarily to the most vulnerable customers which exacerbates the challenge of energy poverty**
- **Program applicants lack trust in program delivery contractors or agencies, leading to low participation**
- **The government programs created to address energy poverty or track its prevalence are limited**

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CHALLENGE STATEMENT #7

Regulatory processes accommodate capacity differences across consumers

What is the systemic barrier?

Provincial electricity policy and regulations are intended to ensure individuals, communities, Right and Title Holders, and businesses in Alberta receive safe and reliable electricity services at just and reasonable rates. The challenge is that, while changes in the electricity system can impact all consumers across this spectrum, not everyone has the time, finances, awareness and literacy on electricity matters to effectively participate and engage in the development of policy and regulation. Related processes have not been designed in a way that prioritizes broad awareness of the matter under review, diverse opinions and lived experiences, nor provide education and capacity supports to enable formal participation in proceedings.

Effectively engaging numerous types of consumers with unique perspectives and concerns takes time. The need for representative engagement must be balanced with keeping processes efficient to support timely, transparent decision-making . The challenge becomes additionally complex as it applies to engaging Indigenous Rights and Title holders, communities, and businesses, especially where trust-based relationships have not already been established.

To build effective relationships, historical and ongoing harms to Indigenous Rights and Title holders must be addressed in a way that respects Treaty obligations and legal realities; engages Indigenous communities as partners at planning stages; and reflects actions and commitments towards reconciliation in final decisions. Going forward, effective relationships with Indigenous communities will be critical for de-risking projects and avoiding prolonged delays, in particular for electricity infrastructure expansion.

Why is this critical to achieving our vision?

Alberta's Electricity Future's vision puts consumer needs at the centre to ensure Alberta's electricity system reflects evolving consumer expectations and enables sectors to remain competitive as the world continues to decarbonize. During the 2024 emergency power alerts, people and businesses in Alberta demonstrated their willingness to make short-term adjustments to their electricity usage to avoid rotating power outages. This willingness to participate is in itself an asset that can be leveraged with increased transparency, literacy, tools and reward structures. By enabling diverse groups of consumers to participate in policy and regulatory processes, policy-makers, regulators and utilities will gain a broader

understanding of changing consumers' needs. This, in turn, can support the creation of a new set of products and services, as well as more equitable services and programs. Additionally, consumers would gain an understanding of why decisions are made, and help them make better informed choices.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved.

The following are examples of surface level-barriers as a result of policy and regulatory processes that currently do not accommodate capacity differences across consumers:

- **There is no common definition of affordability or energy poverty in Alberta to determine just and reasonable rates**
- **The lived experience of electricity consumers is not sought out in regulatory decisions**
- **There is no requirement for regulators or applicants to deeply engage with Indigenous communities or build ongoing relationships**
- **Lack of funding for intervenors limits participation in regulatory proceedings**
- **Methods, timelines and communications employed in the regulatory process limit the engagement of affected communities, individuals and organizations**
- **Emerging need for and business opportunities in creating regional data centres will have substantial electricity needs that require consideration**
- **Industrial consumers have to participate in both federal and provincial regulatory processes, e.g. Clean Electricity Regulation**
- **Lack of avenues for collaboration between government, regulator and consumer groups**

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CHALLENGE STATEMENT #8

Empowering consumers to exercise choice and meet their energy needs simply and economically

What is the systemic barrier?

Consumers in Alberta lack effective tools and incentives to manage their electricity bills. Depending on the type of consumer, electricity bills are typically made up of one or both of the following components:

1) total electricity consumed over a period of time (consumption,) and

2) the maximum amount of electricity they need to power their home or business at any given moment (demand.)

These components impact different customers' electricity bills in different ways.

Residential consumers can offset or reduce a portion of their bill (consumption) if they can afford to install solar panels or high-efficiency appliances. However, these and other energy efficiency approaches may have limited impact on overall bill cost, as fixed costs (e.g. fees for distribution, local access, admin, etc.) can make up a significant portion of these bills. Rural and remote customers may pay even more than their urban counterparts for these fixed and variable fees, as some are calculated based on the distance power has to travel to reach the customer and directly influenced by the number of customers in that region.

Industrial and commercial customers have a few more tools to reduce their bills, given they may be charged based on a combination of consumption and demand, and may be able to participate in wholesale market services. However mechanisms currently available to these customers, including reducing peak demand or participating in operating reserves may not provide sufficient savings, or may require infeasible modifications to their business operations to meet the requirements for participation. Similarly to residential customers, installing behind the meter generation to provide more flexibility may not be feasible options due to space or cost constraints.

Finally, most customers in Alberta have low energy literacy. Alberta's electricity system is uniquely complex and current bill structures are confusing. If customers are even interested in understanding how to lower their bills through consumption and demand, there are few signposts to guide them on where to start.

Why is this critical to achieving our vision?

At the heart of the changing electricity system in Alberta are changing customer expectations and needs. Alberta's Electricity Future's vision sees a future where customers are empowered to be as deeply (or as little) involved in all aspects of their interaction with electricity as they choose and where their proactiveness is rewarded with greater agency over what they pay for electricity. Because of advances in technology, the role of the customers, whether residential, commercial or industrial, is shifting from one of passive consumption to active participation. A simple example is customers who choose to sell self-generated electricity back onto the grid.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved.

The following are examples of surface level-barriers related to consumers being deprived of the agency to materially affect their electricity costs:

- **Most residential customers in Alberta are paying an industry-accepted percentage for their electricity relative to their household income. However, the lowest income customers are paying a higher percentage and consequently experiencing a higher energy burden**
- **Opaque electricity services/options/bills make it difficult for consumers to make choices in their own greatest interest**
- **The current rate design does not incentivize consumers to use electricity efficiently or accurately reflect true system costs**
- **The lack of real-time metering limits rates structures and programs that can enable consumer choice and encourage behavioural changes**
- **The retail market's "rate of last resort" creates a pseudo-competitive market where offerings do not vary much in terms of overarching choice for customers.**
- **Customerswho rent their homes or buildings may be limited in terms of what they can physically do to the building (i.e. energy efficiency improvements, solar installation, etc) to reduce their costs.**

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CHALLENGE STATEMENT #9

Evolving traditional business and delivery models to accommodate DERs

What is the systemic barrier?

Electricity customers are increasingly choosing to install distributed energy resources (DERs) to reduce their carbon footprint, insulate against rising electricity costs, and provide greater resiliency. Generators also see economic opportunities in utilizing the technology, and its potential to provide services to the grid. The addition of DERs creates two unique challenges that will require utilities to adapt their business and delivery models: two-way electricity flow on the distribution system and appropriate cost allocation.

First - two-way electricity flow now requires distribution utilities to have a level of visibility and control into their system never before required. This may increase both the utilities' expenses and customer costs by requiring system upgrades, the installation of new equipment and the development of new skill sets and processes. Two-way flow may also enable DERs to provide support to the operation of the grid and help optimize the use of existing infrastructure.

Second - customers leveraging DERs rely less on traditional grid-supplied electricity, reducing their contributions to maintaining grid infrastructure. To account for this loss in revenue, this may result in utilities redistributing their costs among the fewer remaining customers, further increasing customer bills and encouraging more customers to invest in self-supply through DERs. To ensure customers who cannot install DERs are not left footing the bill for those that can, and potentially increasing inequity, new cost allocation models and pricing structures need to be considered.

Why is this critical to achieving our vision?

Alberta's Electricity Future's vision imagines a system where DERs play a key role, and where utilities have evolved their business and service models to offer a vastly expanded set of products and services. These products and services will enable customers to produce, use, monitor, direct and store electricity in a simple and automated fashion while ensuring the grid infrastructure is there when needed and the utility maintains a viable revenue model. The introduction of a broader spectrum of electricity options, which could be

enabled by DERs, is a key pathway for minimizing the risk that low income customers are left supporting the operation and maintenance of the grid—a key to creating an equitable system. DERs that enhance customer control may drive service-oriented design of utility delivery models and programs, and nurture new entrepreneurship and business models. This has the potential to create new efficiencies and even new income streams for customers.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved.

The following are examples of surface level-barriers to transforming traditional business and delivery models to accommodate increased integration of DERs.

- **DER integration raises reliability, data sharing and privacy concerns**
- **There is insufficient data to model/forecast greater DER integration and its impact, or to inform where DERs may complement / benefit the system**
- **There is limited clarity on how the costs of DER integration will be allocated among different stakeholders (e.g. ratepayers, taxpayers, utilities, consumers)**
- **High volumes of DER integration may require system upgrades / investments in capacity and infrastructure to enable efficient two way power flows**
- **Current regulatory and market structures have limited mechanisms for attributing value and system benefits to DERs, including demand-side flexibility**
- **Mistrust between utilities and customers creates a challenging environment for negotiation and partnership in the creation of better services to benefit both the utility and customer**
- **Some communities and individuals lack the financial and planning resources and expertise to operate and maintain DERs throughout the asset's life span**
- **There is limited visibility and communications within the distribution system to coordinate and dispatch DERs.**
- **Customers experience high costs and a lengthy process to connect DERs to the grid**

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CHALLENGE STATEMENT #10

Regulatory processes that can adapt to change as the energy transition evolves

What is the systemic barrier?

Alberta's regulatory system and its processes were designed for a centralized, large-scale electricity generation system with well-understood risks. The drive to decarbonize electricity grids as well as ensure a reliable and affordable supply is giving rise to new energy solutions, generation sources, business models, and use cases that current processes are not effectively equipped to anticipate, adapt to, or enable in a timely manner. This is because, while new solutions bring potential benefits, there tends to be limited data, models or predictability of those potential benefits to meet current regulatory requirements for project approval.

This challenge goes beyond the volume of change required simply to continue to grow the existing system. The shift required is more fundamentally around managing the uncertainty of the energy transition while continuing to enable forward progress. While a regulatory system that is proactive and can manage increasing uncertainty is needed, any new approach will also need to provide procedural clarity and eligibility requirements to enable investment and economic development. These constraints currently create complex tensions that, if not addressed, create a risk of inaction and fleeing capital, putting the system further and further behind.

Why is this critical to achieving our vision?

Alberta's Electricity Future's vision seeks to enable a more service-oriented delivery design, facilitate greater multi-directional connections, attract new industries, and ensure predictable and equitable rates. In short, it is a future system that delivers value beyond electrons.

Achieving this vision will require us to develop, test, and scale new business models, technologies and innovations, investment models, services, etc. The data gathering, tracking, and analysis required to assess these opportunities is complex and resource intensive. By current standards, there may be minimal conventional data available to support the approval of emerging opportunities, but as standards change their benefits may come into clearer view. However, building the foundational knowledge and experience regionally to be able to seize these opportunities will require a regulatory framework that can embrace

some uncertainty. Further to that, regulatory risks need to be minimized to ensure critical investments are made to successfully transition Alberta's energy systems and grow the economy for the benefit of all consumers.

What surface-level barriers are related to this systemic barrier?

Surface level barriers are often what actors see or experience as a result of a systemic barrier. Such barriers provide insights into areas that can be improved should the systemic barrier be resolved.

The following are examples of surface level-barriers related to traditional regulatory processes not being equipped to account for uncertainty driven by energy transition.

- **Regulators are being asked to rule on complex issues that extend beyond their traditional mandates**
- **There are limited publicly available modeling tools or datasets utilities can use for evaluating emerging opportunities.**
- **Model results may not consider future scenarios or possible outcomes depending on when the model was created and the information available during development**
- **Regulators use proven cost-benefit assessments to approve investments, new solutions have not been proven, causing a chicken-and-egg barrier to new solution approvals**
- **Regulators may require Alberta-specific proof before approving new programs or solutions which have been proven in other jurisdictions**
- **Risk-reward calculations have not been revised to reflect either mitigated risks or additional benefits, leading to excess caution over innovation**
- **Utilities cannot experiment with solutions and iterate with their customers, for fear of unrecoverable costs and significantly wasted time and resources**
- **The system is not encouraged to utilize diverse solutions to meet the bulk and distributed systems' operational needs**
- **The authority to make or change regulations must be expressly delegated through enabling legislation**
- **There is lack of clarity on the planning timelines that need to be considered and modelled**