Lionstooth Energy
AESO Board Presentation

November 2021

Agenda & Key Messages

Agenda:

- Introduction to Lionstooth Energy
- What the Market is Seeing & the resulting Impacts on the Integrated Electric System
- What the Market needs to See Going Forward

Key Messages:

- To achieve Alberta's electricity future, the market needs to follow direction from customers, support the transition to decarbonized two-way energy flows, & accommodate more DCG
- This requires necessary change by the AESO:
  - Radically revised & improved planning
  - The AESO needs to adjust the focus to supporting customers
  - A measured & thoughtful pace to change, supported by quantitative analysis
- The result should be a more efficient & effective system, the benefits of which, will flow to customers, through lower wires charges

Lionstooth Energy

Who is Lionstooth Energy?

Experienced DCG Developer
Team involved with over 120 MW developed since 2009

Low-Carbon Power Experts
Pursuing low-carbon projects, including solar, gas-fired, cogeneration, & waste energy recovery

Actively Developing DCG
30 MW of DCG in development with a 2022 in-service date, followed by 50 MW in 2023, representing $160 million in investment

Industrial Power Demand
Helped industrial operators manage the delivered cost of electricity, through commercial & technical solutions

Active DCG Advocate
Involved in AESO, AUC & DOE engagement, including DSI, substation fractioning, the AMP, ISO tariffs, tariff credits, SS&E, & TReg

Represent DCG Views
Engaged other DCG developers to inform the Key Messages in this Presentation

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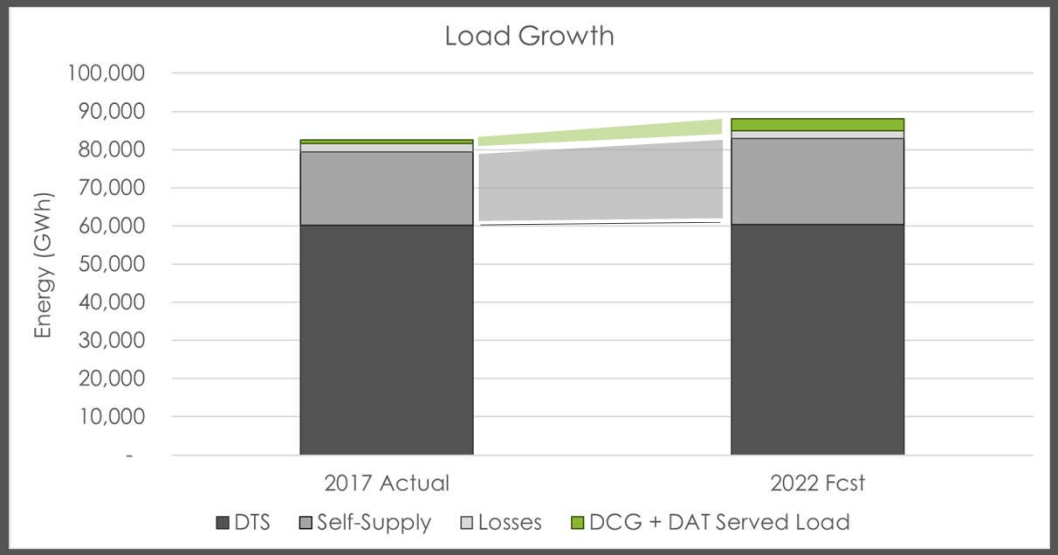
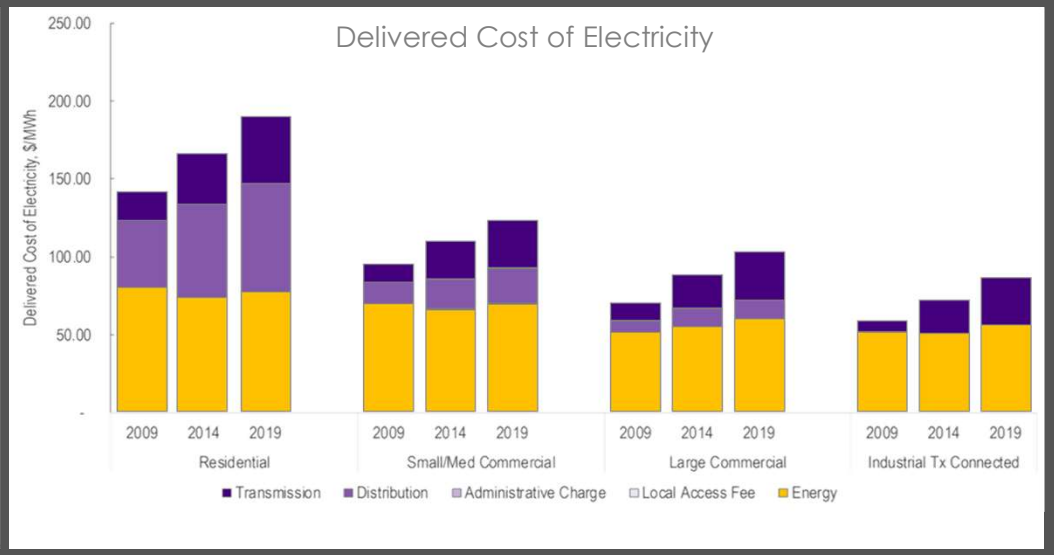
Level Setting: Demand & the Delivered Cost of Electricity





- Practically no increase in Loads over which DTS rates are charged
- Load growth driven by customers choosing self-supply & those being served by DCG

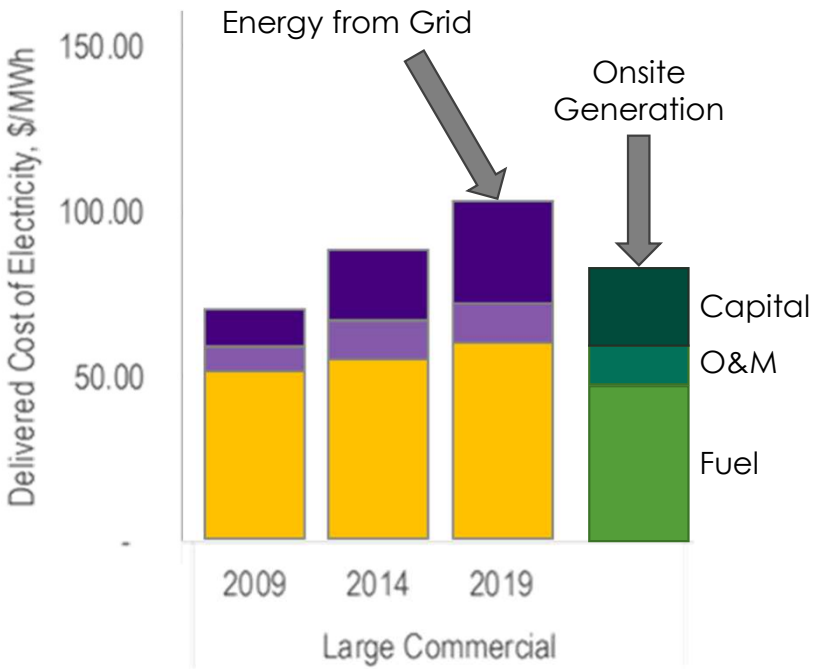
Source: Graph reproduced from AESO BRP Presentations

- In contrast, the Delivered Cost of Electricity has risen
- Driven not by Energy costs but instead by Tx & Dx Wires costs

Source: Graph reproduced from "AESO Delivered Cost of Electricity Estimates Presentation"

AESO Interaction with Load: Failure to Understand

The **rising Delivered Cost of Electricity** is **forcing customers** to develop their own solutions.



- Alberta is unique; Commercial & Industrial customers make up 85% of AIL, resulting in a high load factor, something many jurisdictions would dream for
- For many, the Delivered Cost of Electricity is a significant component of OPEX. These customers are very comfortable:
  - Operating heavy equipment (boilers, compressors, chillers, etc)
  - Operating their own source of energy supply, through a combination of onsite natural gas, solar, & now energy storage
- As the Delivered Cost of Electricity continues to rise, these customers have a choice:
  - Install onsite generation & remain grid connected
  - Install onsite generation & defect from the grid entirely
  - Leave the province
- The decision to reduce exposure to the Delivered Cost of Electricity is much simpler than perceived when it means staying in business, even taking into consideration capital outlays and reliability

The AESO continues to plan for big transmission builds & ways to keep customers bound to the grid, with seemingly little understanding of how customers, particularly this group, will respond to continuously increasing wires costs, & the resulting impact on the rest of the system.

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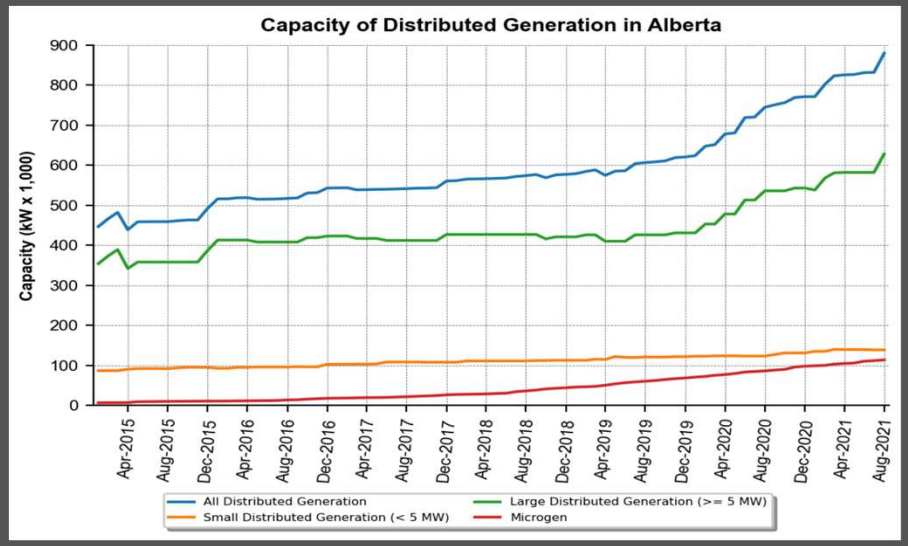
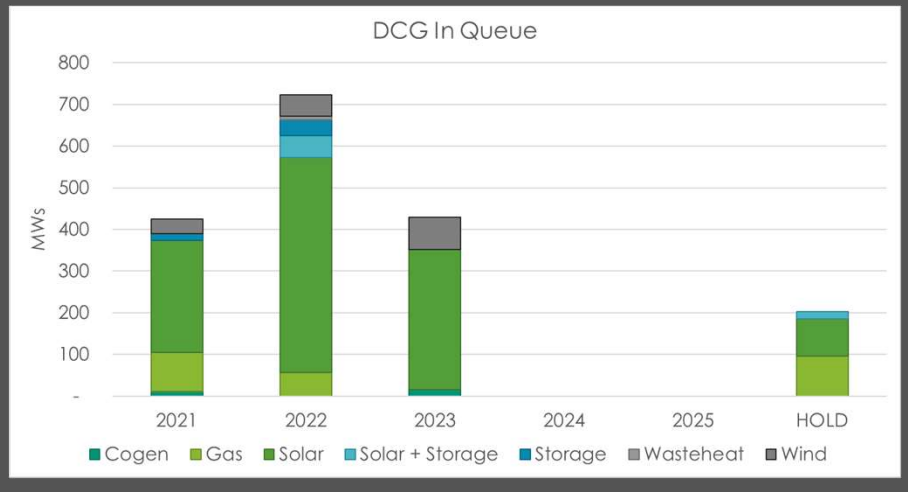
Level Setting: DCG



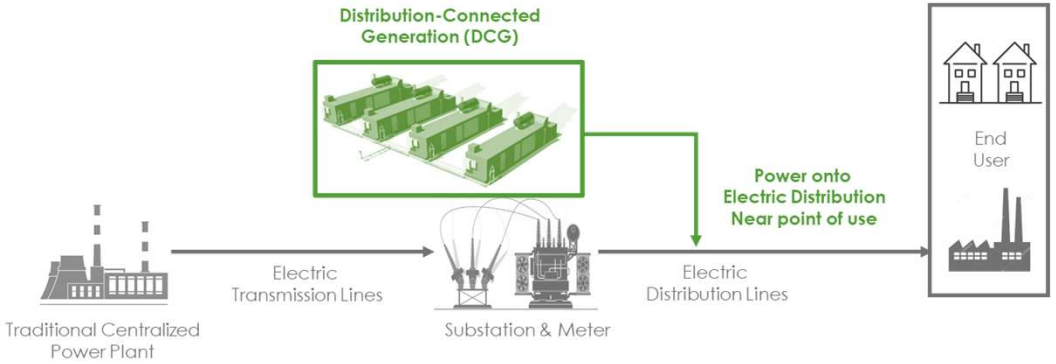


- **DCG have always been a part of the integrated electric system,** becoming a more substantial source over the past 10 years
- As of August 2021, the total installed DCG / DER capacity was **880 MW**
  - More DCG / DER than Dual-Fuel generation (540 MW) & almost more than Hydro (894 MW)
- Around **1,780 MW** of DCG in the AESO Queue, with **535 MW** in Stage 5 (under construction)

Source: Top – AESO Q3-2021 DER Roadmap Progress Update, Bottom – Extrapolated from AESO Oct-2021 Connection Queue

AESO Interaction with DCG: Failure to Plan

The AESO has a duty to "provide for the safe, reliable and economic operation of the interconnected electric system" which includes "all Tx facilities and all electric Dx systems" (except Medicine Hat), & a mandate to plan the Tx system *(Source: EUA)*



- When properly incorporated into system planning, the presence of a "right-sized" DCG can reduce, defer, or avoid future investment in wires, resulting in system wide savings to customers by reducing their wires bills
- DCG developers have produced evidence demonstrating these savings in Alberta, savings that have been recognized in other, more sophisticated jurisdictions (i.e., California), where DCG are integral to their electricity future
- Having heard the AESO's concerns with respect to access to DCG data, DCG developers have offered to collaborate with the AESO to provide the necessary inputs to further support forecasting, signal response behavior, modelling, & planning

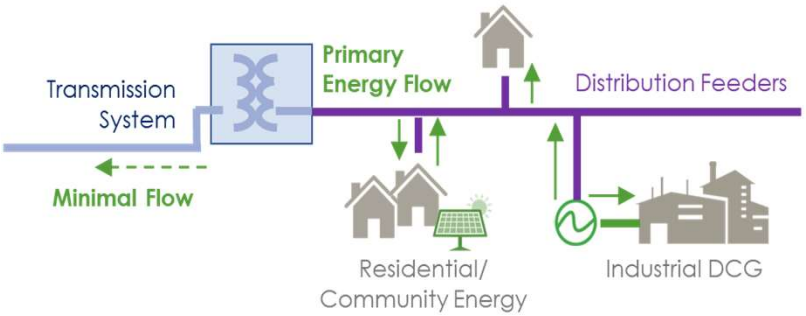
And yet, this year, the AESO again confirmed that they do "not currently consider the presence of DCG in the planning & operation of the Tx system." This is the equivalent to building a ring road, without considering the flow of traffic, & where to place on- & off-ramps. *(Source: Jun-21 26090 Decision)*

Instead, the AESO is seemingly focused on pursuing & enacting change that negatively impacts existing & planned DCG developments & actively intervening against DCG before the AUC, which increases the disparities & barriers to entry faced by DCG, & tips the playing field even further in favor of traditional wires solutions and TCG

Electricity Future: Democratized, Decentralized, & Decarbonized

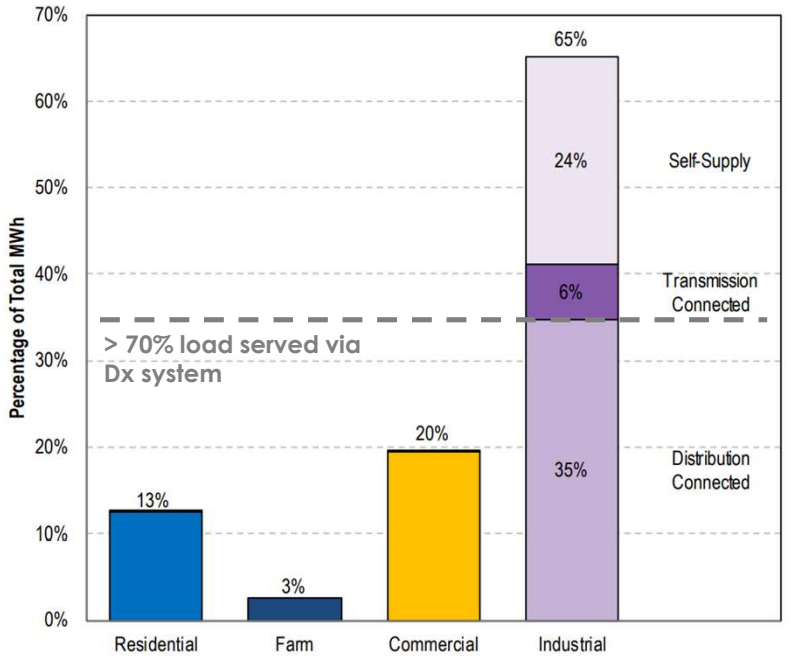
Democratized, Decentralized Customer Choice:

The future is driven by customer choice, as they define the services they want, & take increasing control over those services. More & more, smaller generation will serve individual customers, with energy flowing from customer to customer, Dx feeder to Dx feeder, and then onto the Tx system.



Decarbonized, Two-Way Energy Flow:

At the same time, Canada is legislating Net-Zero by 2050 goals, starting with a focus on electrification. By 2030, monumental change in energy consumption will occur. To achieve this future, the market needs to follow this direction from customers, support the transition to decarbonized two-way energy flows, & accommodate more DCG.



Reduced Wires Growth:

Change & evolution does not preclude, negate, or eliminate the need for the utilities. At the same time, customers need to be protected from further growth in regulated assets & infrastructure that no longer fit what customers want or need.

Source: Bottom – "AESO Delivered Cost of Electricity Estimates Presentation"

The Necessary Change: What the Market needs to See from the AESO

1. **Radically revised & improved planning** to better reflect the current & future state of the market. This requires:
   - Immediate updates to the LTO to better reflect decarbonized, two-way energy flows
   - An adjusted LTP that incorporates customer response to signals, & relies on DCG, & other NWS, as a means to reduce, defer, or avoid future wires growth, not just a plan for more wires
2. **The AESO needs to STOP,** picking winners and losers, advancing unnecessary change, dismissing customer response, restricting customer choice, & being a road-block for developers
   - Customers exercising choice is not the problem. Increased DCG is not the problem. The high Delivered Cost of Electricity is the problem, & building more unnecessary wires is not the solution
   - The immediate focus & top priority must be on improving planning
3. **A measured & thoughtful pace to change, support by quantitative analysis**
   - This has to be a fundamental of future change, to justify need, understand usage, costs, cost avoidance, allocation methods & alternatives, & impact analysis to better understand outcomes & prevent unintended consequences

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The Resulting Benefits: A more Efficient & Effective System

Radically Revised & Improved Planning

- More efficient systems & more effective wires build, which can support locational signals
- Improvements that flow-through to the connection process

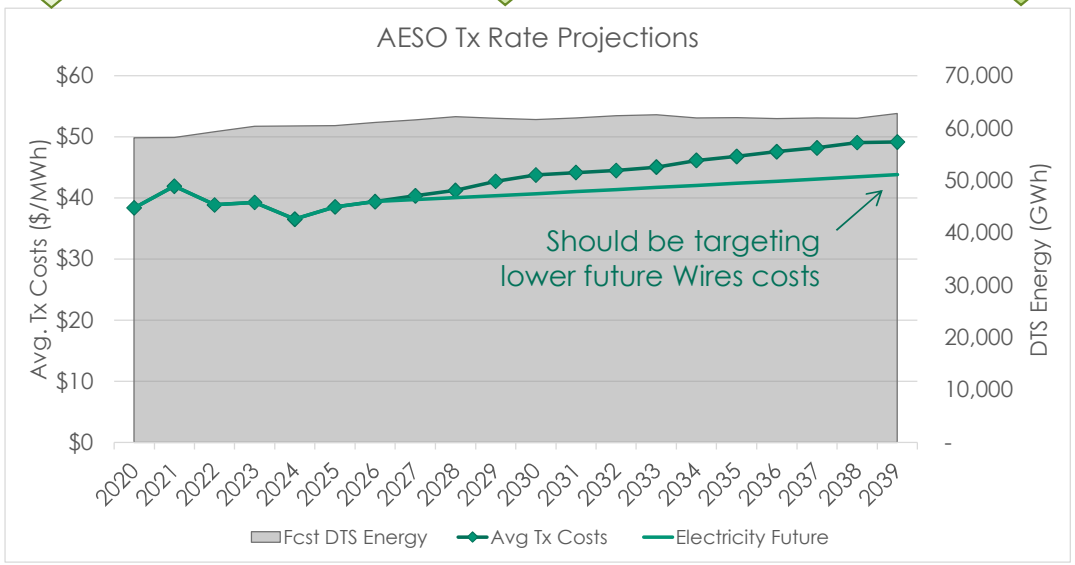
The AESO needs to STOP

- Adjust focus to supporting customers, both load & generation, for an innovative, forward-thinking approach

A measured & thoughtful pace to change

- More buy-in from stakeholders, resulting in more efficient & effective regulatory processes
- Allows for new voices, bringing diversity to a market saturated with incumbent & utility points-of-view

Customers need to see a reduction in the future cost of the wires system



The result should be a more efficient & effective system, the benefits of which, will flow to customers, through lower wires charges

Source: Graph reproduced from AESO TRIP model (Proceeding 26911)

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