Lionstooth Energy Proposal

April 30th, 2020

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Agenda & Overview

Agenda

- Introduction to Lionstooth Energy
- Level-Setting & the Principles the Proposal is based on:
  - The Problem as LTE sees it
  - Key Policy & Principles
- Proposal
- Implications of Proposal
- Summary

Lionstooth Energy Proposal

Proposal	Policy / *Principle*
1. Historical costs remain in TFO/DFO rate base	• "Load Pays" Policy • Recovery of revenue requirement *principle* • Investor Certainty *principle*
2. DCG pays for incremental cost for Tx upgrades caused by DCG	• Locational signal Policy • Cost causation *principle* • No future risks *principle* • Investor Certainty *principle* • Parity between TCG & DCG *principle*
3. Refund to DCG as load increases	• "Load Pays" Policy • Cost causation *principle*

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Experienced Generation Developer

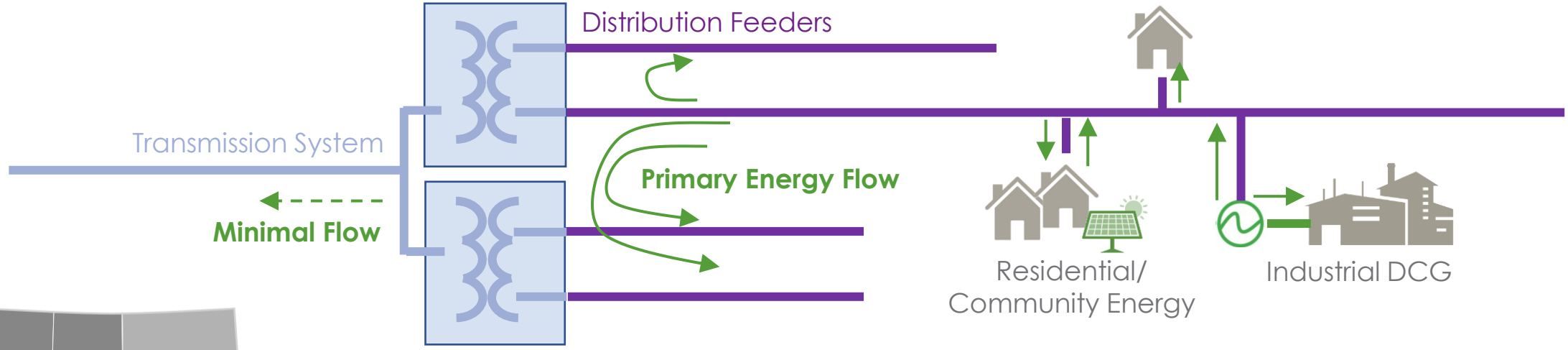
- Developing Alberta-based projects since 2009
- Over 100 MW of projects designed, constructed and operated
- Focused on natural gas fired distributed generation
- Also providing advisory consulting for other developers

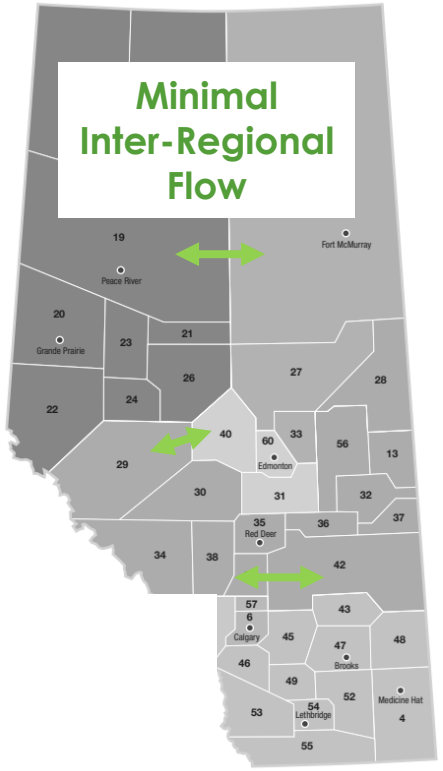
Active Advocate for DCG

- Participating in DCG consultations & proceedings since 2017 Dx Inquiry

Location	Cadotte	Judy Creek	Galloway	Cadotte	Judy Creek	Carson Creek	Swan Hills	Swan Hills	Karr	Gold Creek
Capacity	4 MW	2 MW	4 MW	20 MW	15 MW	15 MW	5 MW	7 MW	3 MW	3 MW
In-Service Date	2012	2012	2013	2013	2014	2014	2015	2016	2016	2017
Grid Connected	•	•	•	•	•	•	•	•		
Isolated									•	•
Sales / Produced Gas					•	•			•	•
Flare Gas	•		•	•			•	•		
Waste Heat		•								•
Technology	Micro-Turbines	ORC	Micro-Turbines	Recips	Turbine	Turbine	Recips	Recips	Recips	Micro-Turbines
Industry Partner	•	•	•	•			•	•	•	•
Independent					•	•				
Still Operating?	•	•	•	•	•	•		•	•	•

Future Vision for Alberta Electricity





The future is being driven by customer choice.

- Electricity consumption & supply will become increasingly more democratized and personalized
- Local Distribution systems/planning regions will become more self-contained
- Distribution utilities will become the enabler of intra-regional energy flows
- Transmission Utilities will still support:
  - Location-specific loads (large industrials) and generators (wind, nuclear) that exceed the capacity of the distribution system
  - Inter-regional and inter-provincial energy flows (still important, relied on less frequently)
- Policy and principle development should:
  - Continue to look at what best enables customers
  - Protect customers from further growth of "sunk assets" that no longer fit what customers want

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Proposal Collaboration

- As an experienced developer of DCG, Lionstooth's business is directly and materially impacted by the outcome of these Technical Sessions and the total cost for DCG interconnection
- To support LTE's proposal development, we engaged the following entities to gain an increased understanding of their concerns, motivations, & comments on Lionstooth's proposal
  - AESO
  - ATCO Electric
  - FortisAlberta
  - Kalina Power
  - URICA Energy Mgmt
  - DCG Consortium
  - BluEarth Renewables
  - Razor Energy
  - Campus Energy
  - Peters Energy Solutions
  - Aura Power Renewables
  - Montana First Nation
  - Ermineskin Cree Nation
  - Métis Nation of Alberta
  - Solar Krafte
  - EDC Associates
  - IPCAA

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Level-Setting & the Principles the Proposal is Based On

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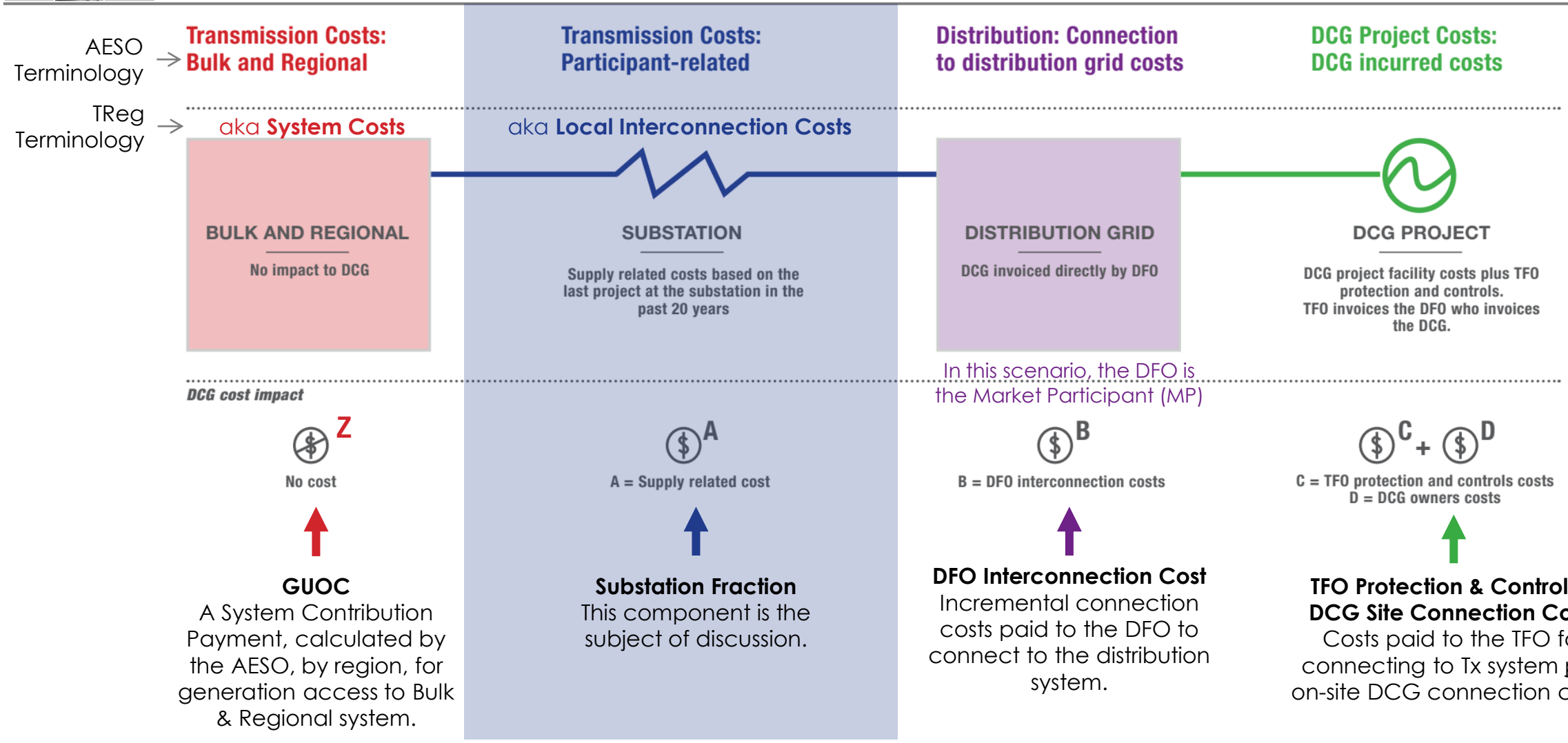
Level-Setting: Focus is on Participant-related Costs



GUOC
A System Contribution Payment, calculated by the AESO, by region, for generation access to Bulk & Regional system.

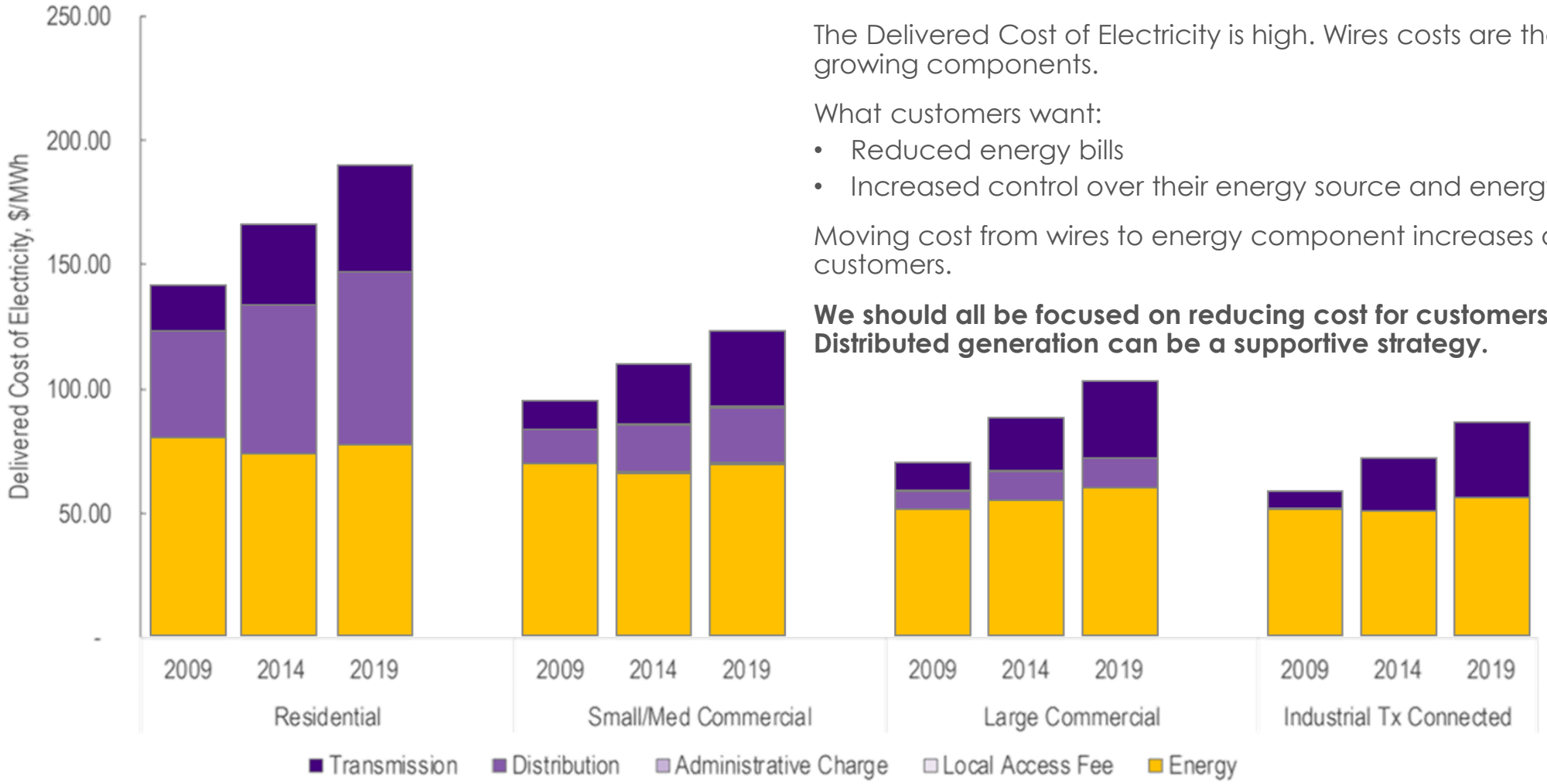
Substation Fraction
This component is the subject of discussion.

DFO Interconnection Cost
Incremental connection costs paid to the DFO to connect to the distribution system.

TFO Protection & Controls + DCG Site Connection Costs
Costs paid to the TFO for connecting to Tx system plus on-site DCG connection costs.

DCG Total Interconnection Cost: Z + A + B + C + D
Focus of this discussion is A cost only.

Level-Setting: Impacts to the Delivered Cost of Electricity



The Delivered Cost of Electricity is high. Wires costs are the fastest growing components.

What customers want:

- Reduced energy bills
- Increased control over their energy source and energy consumption.

Moving cost from wires to energy component increases overall bill for customers.

We should all be focused on reducing cost for customers. Distributed generation can be a supportive strategy.

DCG technologies are increasing in Residential & Commercial customer groups. This is not a short-term event; this is a fundamental shift in how customers source their energy. This issue requires solutions-based focus, not reallocation of costs.

*Graph reproduced from "AESO Delivered Cost of Electricity Estimates Presentation" posted with Bulk & Regional engagement (09 Mar 2020).

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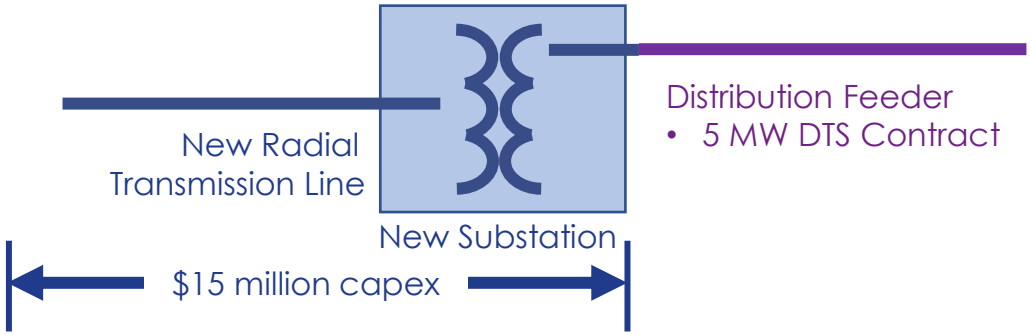
The Problem as Lionstooth sees it

New "Radial" Substation



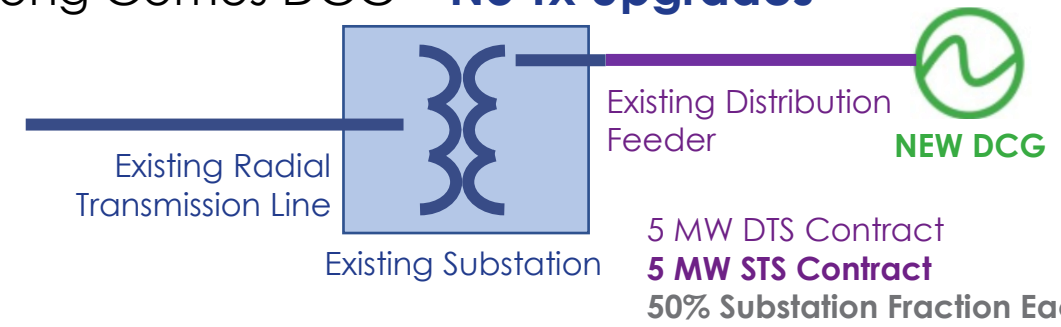
TFO
- $10 million allowable investment
- Rolled into rate base, earns regulated return (8 ¾% return)
- Recovered through DTS tariff

DFO
- $5 million capital contribution
- $5 million rolled into DFO rate base, earns regulated return (8 ¾% return)
- Recovered through Dx tariffs

Load Customers
- Wires bills increase to pay for increased Tx & Dx rate bases*

***Example Footnotes:**
- High-level example for illustrative purposes
- Does not account for timing imbalances in rate design
- Does not account for significant amount of time between "new radial substation" and "addition of DCG"

Along Comes DCG – **No Tx Upgrades**



TFO
- $5 million allowable investment (decreased due to changes in substation fraction)
- $5 million removed from TFO rate base (de-systemizing)
- **TFO NOT HAPPY**

DFO*
- $2.5 million capital contribution (decreased due to changes in substation fraction)
- $2.5 million removed from DFO rate base (de-systemizing)
- **DFO NOT HAPPY**

Load Customers
- Wires bill decreases*
- Energy bill increases, likely increasing more than wires goes down
- **Load Customers NOT HAPPY**

DCG Customer
- $7.5 million capital contribution
- 25-50% increase in CAPEX
- Recovered through energy market (15-20% return)
- **DCG NOT HAPPY**

No one should be HAPPY with this allocation methodology!

Key Policy & Regulation

Transmission Development Policy & Transmission Regulation

- Tx policy must contribute to a stable investment climate
- Tx should not be a barrier to generation development

Policy 1 – Load Pays for Transmission

- Payment for Tx is primarily borne by loads, recovered through regulated tariffs (rather than energy market)
- TDP recognizes wires charges allocated to generators will ultimately be passed onto customers through energy price

Sec 47: Costs of the Tx system are wholly charged to DFOs, ISDs, etc., & the amount payable by DFOs is recoverable in the DFO's tariff

Policy 2 – Generator Locational Signals

- To align interests, a financial contribution from generators is required based on their size and proximity to load centres
- Wholesale electricity market should not be unduly distorted with allocated Tx costs

Sec. 28: Generators [TCG] pay **local interconnection costs**
Sec. 29: Generators pay **GUOC** (recovery for system costs)

Rate Design *Principles*

FEOC:*

- Fair – participants are working with a leveling playing field
- Efficient – transactions between willing parties are not impeded
- Openly Competitive – competition is not impeded

- Refers to market and economic efficiencies and outcomes, not perceived inequities or leveling of physical conditions

Tariff Design *Principles* (Bonbright)

- *Principle 1* – Recovery of Revenue Requirement
- *Principle 2* – Cost Causation
  - Provision of appropriate price signals that reflect all costs and benefits

*With support from Kalina Distributed Power, Proceeding 24116 Exhibit 24116-X0599.01 "Written Submission" (March 2020).

Load pays & generators are incented to locate close to load.
Design *principles* cannot override TReg & TDP Policies.

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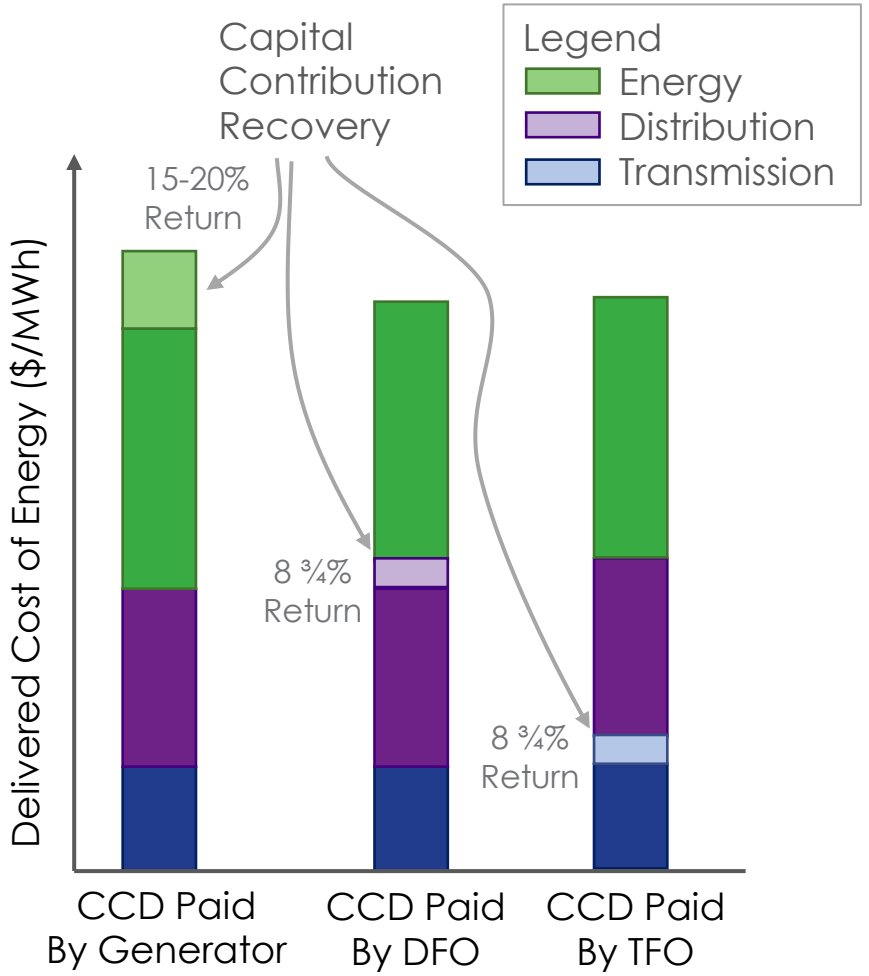
Impact of Current Allocation Methodology

- Starting with the TDP, there was a conscious shift to removing embedded costs of the wires system from generators. The TDP noted that removing this approach will:
  - Ensure regulated Tx price distortions are not introduced into the wholesale market
  - Provide transparent pricing for Tx service to customers
  - Align with neighboring jurisdictions

- The TDP also acknowledged and recognized the flow-through relationship between wires-based generation charges and the energy market
  - Example: customers ultimately pay for losses through their energy price

- This approach was aligned with FEOC, in that it pursued efficient market outcomes, not settling for perceived inequities or recovering costs based on benefits



The current Allocation Methodology is leading us back to a market where, **Tx price signals will distort the energy market,** and load, which ultimately pays, will see **further increases in the total delivered cost of energy**.

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Proposal Detail

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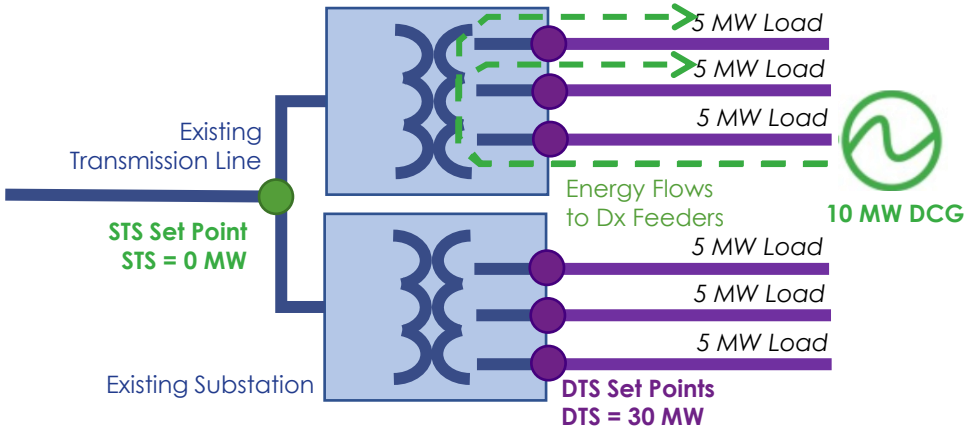
System Costs Z	Tx Local Interconnection Cost A	Dx Local Interconnection Cost B	DCG Project Cost C+D
BULK AND REGIONAL	SUBSTATION	DISTRIBUTION GRID	DCG PROJECT

GUOC
No Change
	• Historical wires costs remain in TFO/DFO rate base
	  • No removal of investment from rate base
	  • No Tx distortion of energy market
	• DCG should pay for the **incremental cost** for Tx upgrades caused by the DCG connection
	  • Costs known up-front
	  • Paid at time of connection
	  • Principle of cost-causation
	  • No need for substation fractioning
	• As load increases, refund to DCG (just like TCG)
	  • DCG cannot claim exclusive right to incremental Tx / Dx capacity
	  • Refund based on actual demand flows on Dx system, not necessarily DTS contract demand
	• DCG pays STS charges based on actual supply flows onto Tx system
		No Change	No Change



The cost of the wires system continues to be primarily borne by load.
DCG pays local interconnection cost, including both Tx & Dx costs, calculated on a cost causation basis.

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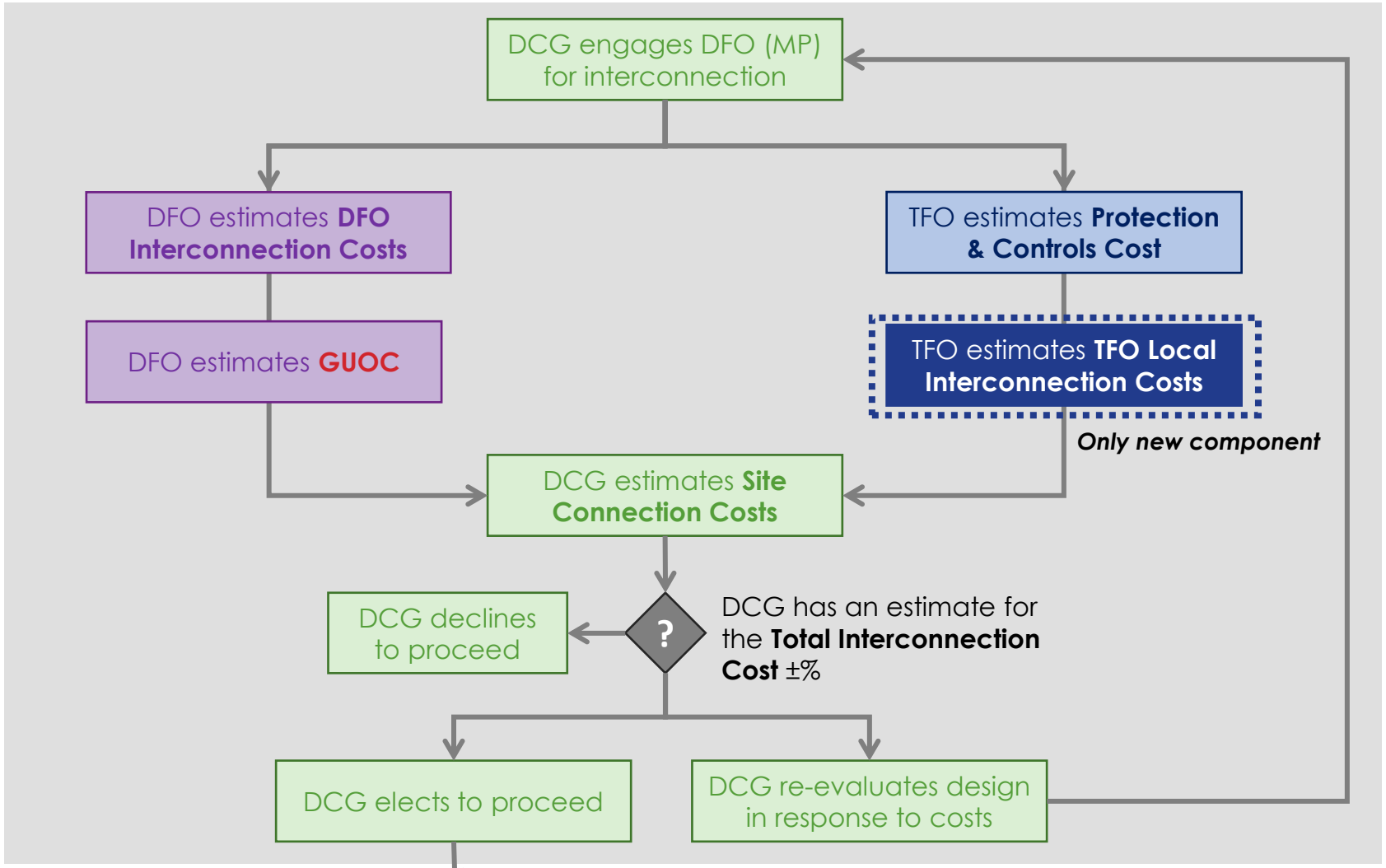
DCG Connection Process



- Lionstooth proposal does not require significant changes to ISO Ts & Cs or the Connection Process
  - DCGs are provided with cost estimates before DCG enters the Queue
  - Opportunity for DCG to respond to market signals (i.e. connection costs)
- DFOs enable the DCG connection

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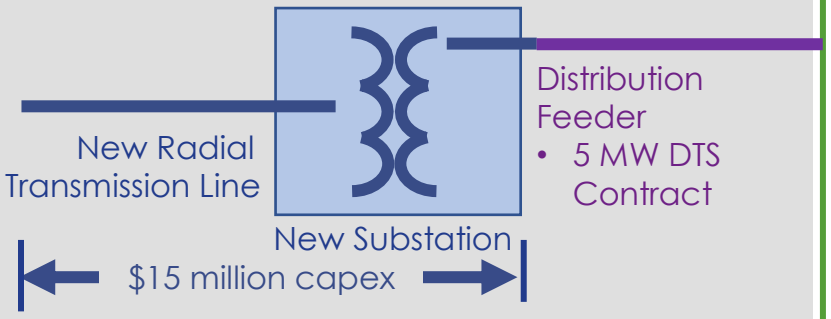
Proposal Implications

Applying the Lionstooth Proposal

New "Radial" Substation



TFO
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- Rolled into rate base, recovered through DTS tariff

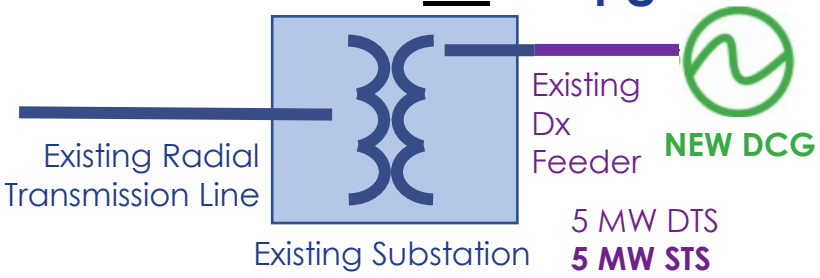
DFO
- $5 million capital contribution
- Rolled into rate base, recovered through Dx tariffs

Load Customers
- Wires bills increase to pay for increased Tx & Dx rate bases*

No change to these assumptions

***Example Footnotes:**
- High-level example for illustrative purposes
- Does not account for timing imbalances in rate design
- Does not account for significant amount of time between "new radial substation" and "addition of DCG"

DCG Connects – **No** Tx Upgrades



TFO
- No change to TFO investment or rate base
- **TFO kept whole**

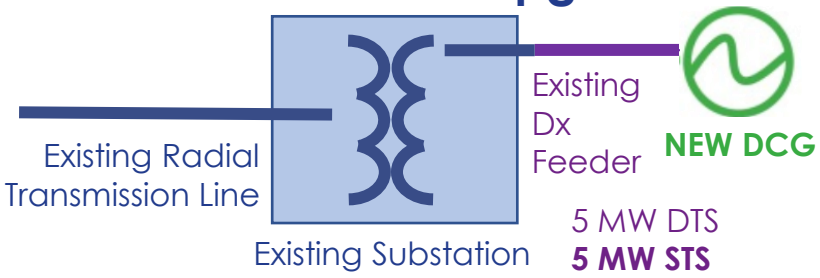
DFO
- No change to DFO contribution or rate base
- Dx Feeder improvements to allow for DCG
- **DFO kept whole**

Load Customers
- No change to wires bills*
- Increased reliability for direct Dx loads & grid wide
- **Load Customers indifferent**

DCG Customer
- Signal to "right-size" DCG
- No Tx upgrades = no local interconnection costs
- **DCG indifferent**

No one harmed, at most indifferent.

DCG Connects – **Tx Upgrades**



TFO
- No change to TFO investment or rate base
- **TFO kept whole**

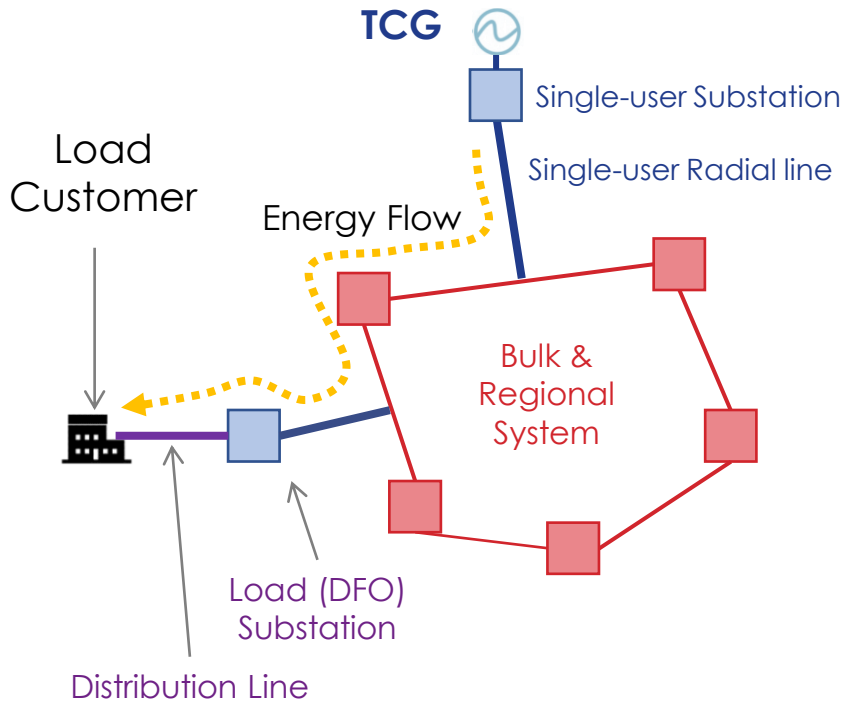
DFO
- No change to DFO contribution or rate base
- Dx Feeder improvements to allow for DCG
- **DFO kept whole**

Load Customers
- No change to wires bills*
- Increased reliability for direct Dx loads & grid wide
- **Load Customers indifferent**

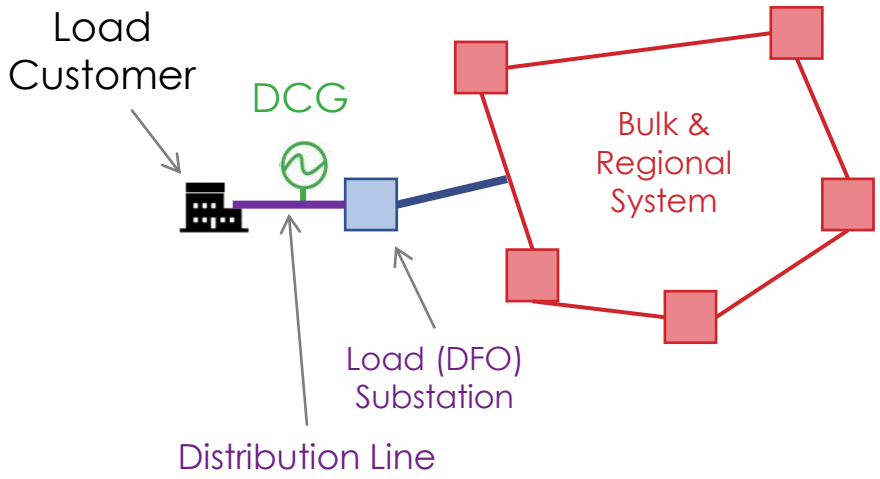
DCG Customer
- Incremental **local interconnection costs** due to DCG
- DCG able to evaluate design in response to market signal
- **DCG pays for costs caused**

DCG locational signal.

Comparison – TCG vs DCG



- Energy flow from TCG to a Dx connected load requires:
  - TCG's radial line & substation
  - Bulk & Regional System
  - Radial line to the DFO substation
  - DFO substation
  - DFO Dx line
- The TCG pays for their radial line as a locational signal, and GUOC to pay for bulk/regional use
- **TCG does not pay for use of radial line to DFO, fraction of DFO substation, distribution line use – these are all accommodated in GUOC**



- Energy flow from a DCG to a Dx connected load requires:
  - DFO distribution line
- The DCG pays for their **Dx interconnection** as a locational signal, and **GUOC** (although "right-sized" DCG may not use regional/bulk)
- **Right-sized DCG does not use the substation, and does not use the radial line, but under current methodology could be assessed a cost associated with these.**
- **The Lionstooth proposal accommodates the disparity of TCG benefiting from using the radial lines, substations and distribution lines that were paid for by load.**
- **In addition, there is a need to acknowledge the benefits of DCG as a "load sink" which increases the capacity of the Dx system at DCG's cost**

Summary

Lionstooth Energy Proposal

Proposal	Policy/Principle
1. Historical costs remain in TFO/DFO rate base	• "Load Pays" Policy & Regulations • Recovery of revenue requirement *principle* • Investor Certainty *principle*
2. DCG pays for incremental cost for Tx upgrades caused by DCG	• Locational signal Policy • Cost causation *principle* • No future risks *principle* • Investor Certainty *principle* • Parity between TCG & DCG *principle*
3. Refund to DCG as load increases	• "Load Pays" Policy • Cost causation *principle*

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Supplemental Information

Questions to Resolve

AESO Proposal Guideline Questions	Lionstooth Response
1. Should the AESO or the ISO tariff make a distinction for DCG as being different from a DFO or a TCG or load?	The AESO needs to continue to view DCGs as a generator. This proposal does not require significant changes to ISO Ts & Cs or the Connection Process. However, the ISO tariff may need amendments to better reflect an increase in two-way energy flows between the Tx and Dx systems. See Slide 14.
2. How can DCG optimize Dx or Tx facilities by either their connection or their supply?	DCGs benefit the system through their role as "load sinks." A right-sized DCG can reduce local congestion, increase system capabilities, increase utilization, and defer more costly investment, as a non-wires alternative. Sending locational signals to DCG achieves this and is aligned with the TDP & TReg. This does require stable signals and additional planning of two-way energy flows. See Slides 4, 13, & 17.
3. How can the value or optimization of Dx or Tx facilities be determined?	In collaboration with a specific DCG and associated DFO, the AESO should be able to quantitatively model, on an hourly basis, the available load-serving capacity of the Dx feeder, associated substation, and associated Tx line resulting from the presence of a DCG. For example, this would show during peak demand hours the ability of an operating DCG to reduce congestion. It is also our view that this can be used as a long-term planning tool. Just as the AESO models forecast loads, it can model the impact of DCG in specific planning areas. Publishing these locational signals would help DCG to locate where able to better support the system.

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Questions to Try to Answer

AESO Proposal Guideline Questions	Lionstooth Response
1. What is the fair or appropriate methodology to determine minimum facilities required to allow DCG to access the Tx grid? Is the fairness methodology an on average calculation across all DCGs in the province or should the fairness methodology account for differences throughout the province?	It's important to note fair should refer to market and economic efficiencies and outcomes, not leveling of physical conditions. The appropriate methodology is to assess DCGs impact on Tx facilities on a direct cost-causation basis at time of connection. Averaging across all DCGs or sites does not send the right locational signal. See slides 10 & 13.
2. How should ISO tariff local investment be implemented given increasing amount of generation added to traditionally load-only point-of-deliveries?	The TDP and TReg are clear in our view. Load pays and generators should be incented to locate close to load. Historical wires costs remain in TFO/DFO rate base and DCG should pay for the incremental cost for Tx upgrades caused by the DCG connection. See slides 10 & 13.
3. Can the proposal be implemented within the existing ISO tariff provisions? If not, what will need to be changed.	We believe so. This proposal is not intended to have significant changes to ISO Ts & Cs or the Connection Process. See Slide 14.

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