

# Proposed Market Rule Updates for Connection of Electricity Storage and Load Displacement Units

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# Terms of reference:

## *'Electricity Storage' means*

- *withdrawing electrical energy from a transmission system, a distribution system, or from a load facility or generation facility,*
- *storing this energy for a period of time, and*
- *injecting back this energy, minus reasonable losses, at the location from where it was originally withdrawn.*

## *'Load Displacement Unit (LDU)' means*

- *generation or storage unit(s) that are installed within a load facility directly connected to the IESO controlled grid (ICG)*
- *strictly used for the needs of the customer, and*
- *don't intentionally inject active power into the transmission system*

# Agenda

- The need to update Market Rules
- Overview of the proposed updates to Market Rules

# Why update the Market Rules

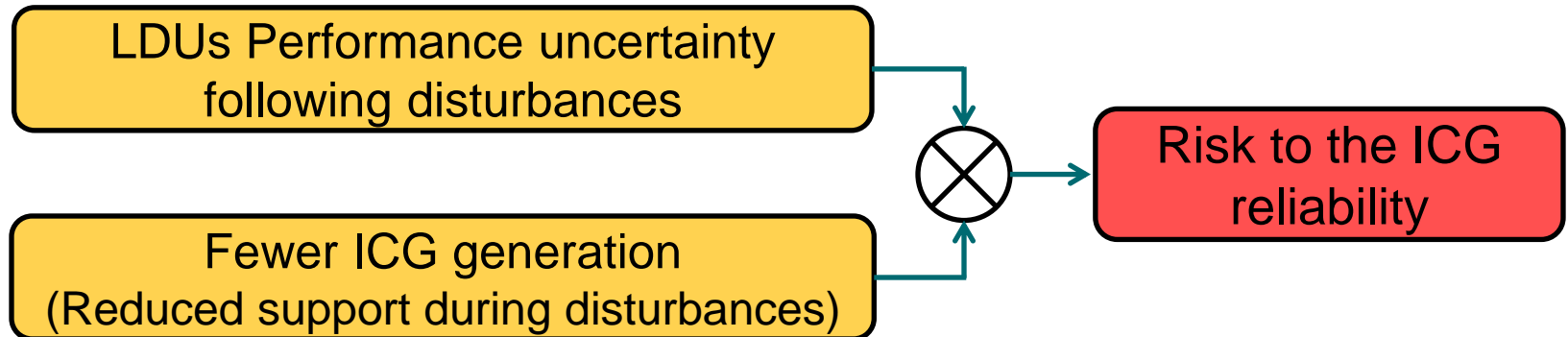
Treatment of Electricity Storage is not discussed in the Market Rules

- There is a lack of clarity on which performance requirements to apply

# Why update the Market Rules

## Increased penetration of LDUs

- No specific performance requirements for units < 10 MW & facilities < 50 MW



- 2018 IESO Operability Assessment identified the need for these units to ride-through transmission faults

# Why update the Market Rules

## Clarity on performance requirements

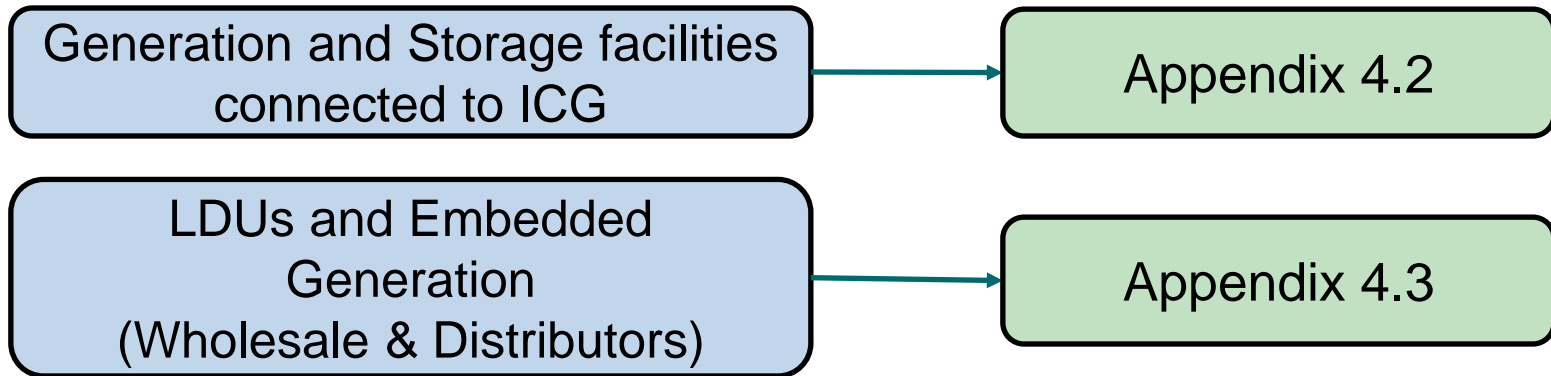
- Inverter-based units can enter into momentary cessation, i.e., stay connected but cease injections following disturbances
  - No support to the grid for fault recovery
  - Can adversely impact IESO-controlled grid reliability
  - Examples: August 16, 2016 California lost 1,200 MW of PV and in October 9, 2017 California lost 937 MW
- NERC is updating PRC-024 to explicitly ban the use of momentary cessation for BES facilities

# Overview of the proposed updates

- Market Rule Chapter 4 Appendices updates:
  - Extend performance requirements of Appendix 4.2 to electricity storage facilities directly connected to the ICG
  - Explicitly specify inverter-based units may not enter into momentary cessation during the ride-through period
  - The following requirements will apply to all generation and storage units regardless of their size or connection point
    - **Off-nominal frequency operation:** ride-through frequency excursions
    - **Freq. control:** change active power in response to frequency variations
    - **Voltage ride-through:** ride-through voltage excursions

# Key Messages

- Performance requirements are consolidated together to make applicability clear for Market Participants



- Clarity on these performance requirements help ensure these units support ICG reliability



# Resources

- Market Rules Chapter 4 Appendices <http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-rules/mr-chapter4appx.pdf?la=en>
- Market Rules Chapter 11 <http://www.ieso.ca/-/media/Files/IESO/Document-Library/Market-Rules-and-Manuals-Library/market-rules/mr-chapter11.pdf?la=en>
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# Questions?

