

***Growing the Margins:  
Energy, Bio-products and Byproducts from  
Farm and Food Sectors***

***Connection Generators to Hydro One Grid***

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**Hydro One Networks**



## Presentation Focus:

- Update on Hydro One Experience
- Distribution Generation Connection Process - Quick Overview
- Technical, Procedural (including Queuing), Regulatory Update
  - Dealing with Challenges
- Projects up to 500 kW:
  - What exists and what's new to facilitate connection?

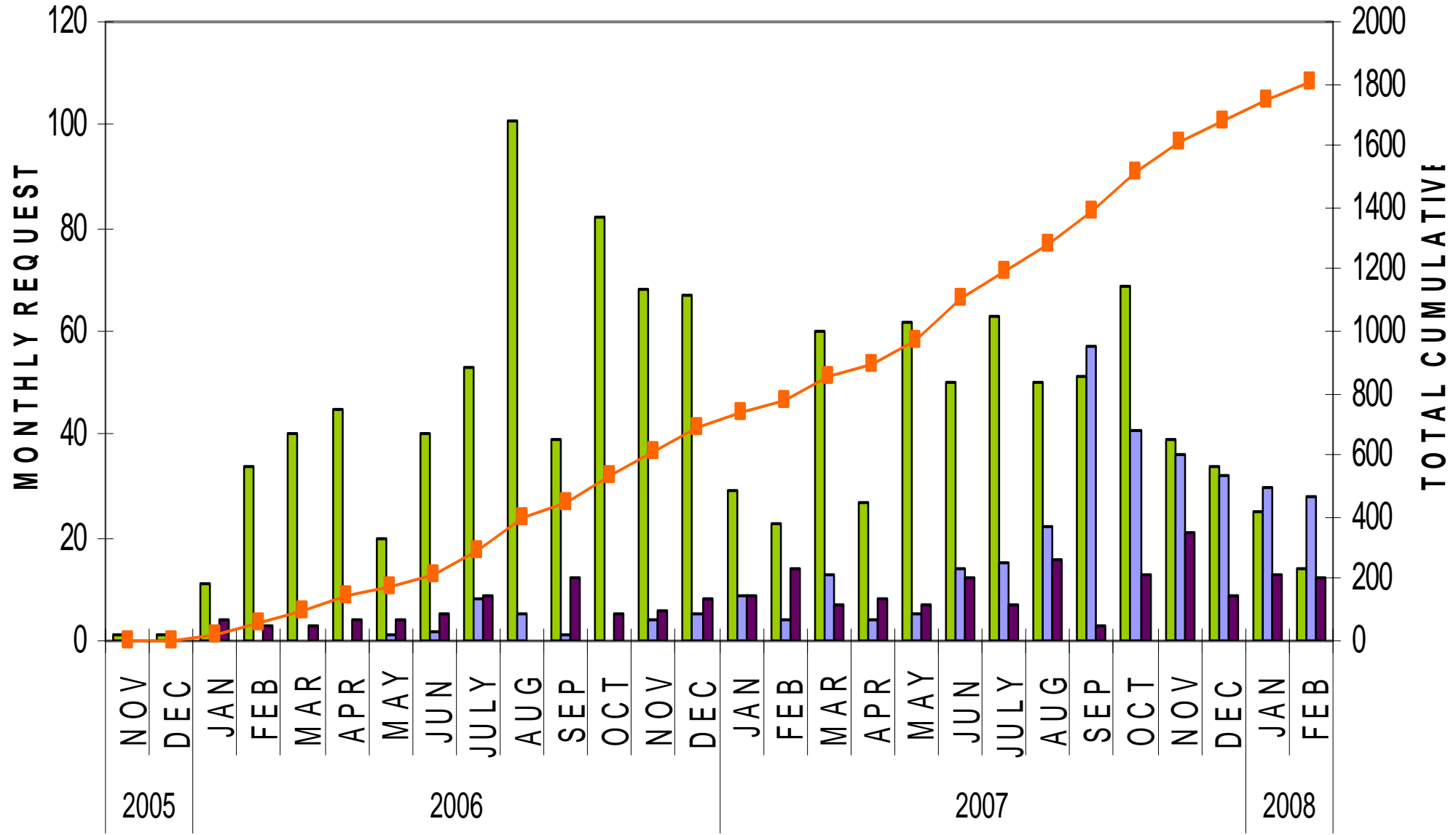


# Hydro One's Distribution Generation Connection Experience

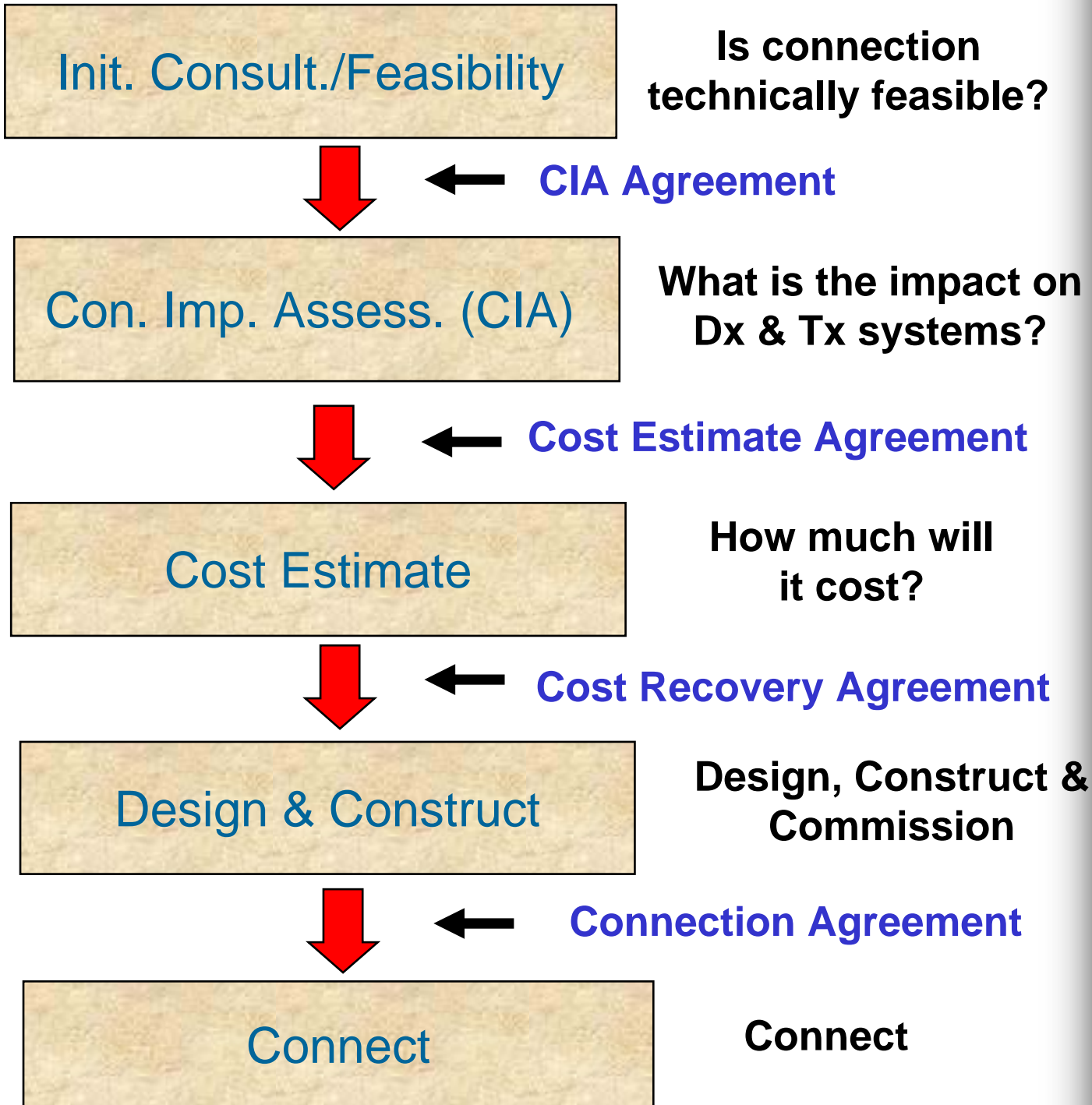
- Connected 25 Generation projects with a total capacity of about 38 MW
- Connected 100+ Net Metering generators over 2000 kW since May 2006
- Completed over 400 Connection Impact Assessments (CIAs) since January 2006
- Completed over 700 Initial Feasibility Assessments (IFAs) since January 2006
- Worked with other LDCs as host LDC
- Over 1800 applications for Standard Offer Program (SOP)



# New Generation Connection Assessment Requests November 2005 - February 2008

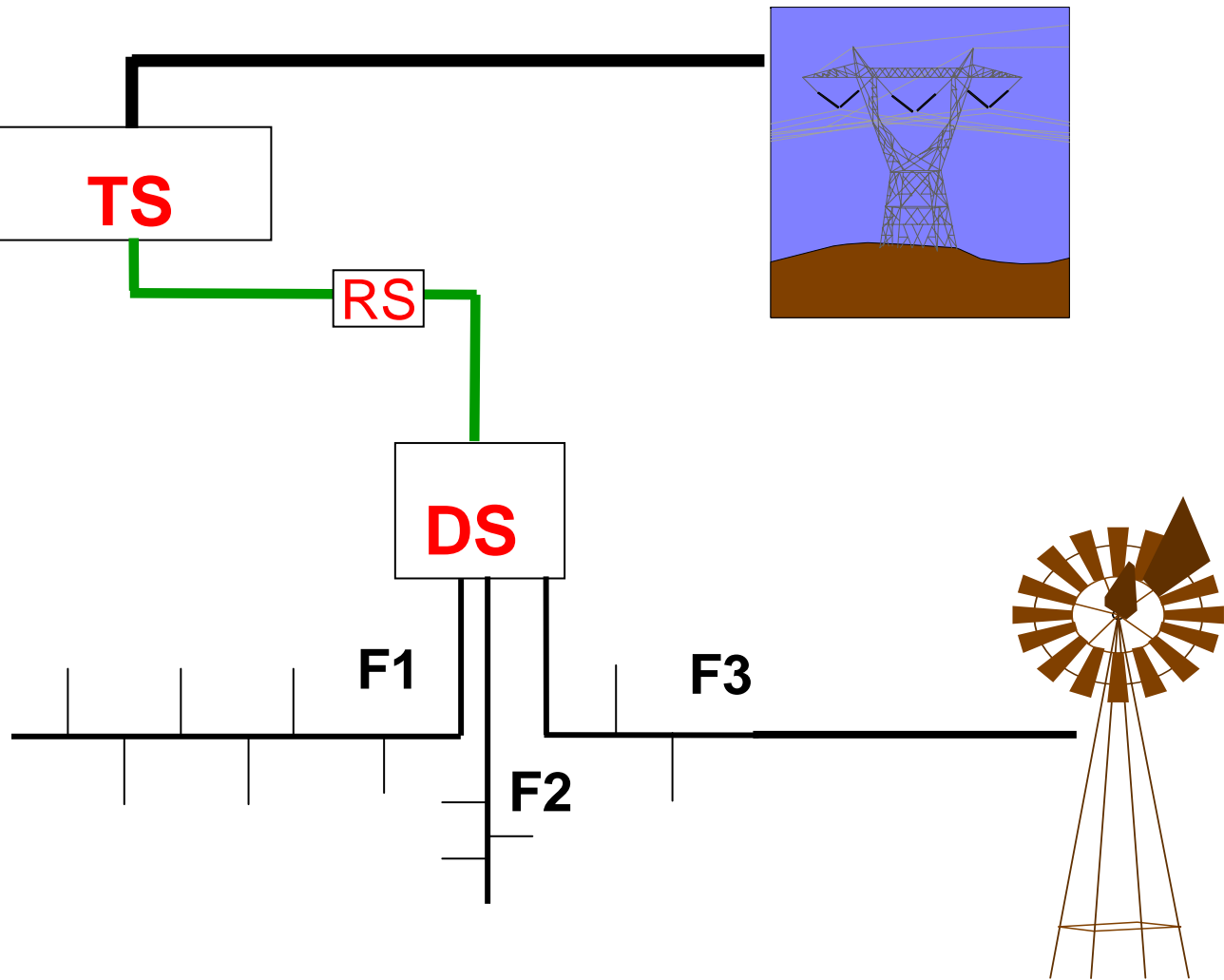


WIND
  SOLAR
  OTHER
 TOTAL - month
 TOTAL - cumul.



**Distribution  
Generation  
Connection  
Process -  
*Simplified***

# What is a Connection Impact Assessment (CIA)?



- Ensure:**
- Safety of LDC workers
  - Protection of LDC assets
  - No negative impact on LDC system & its customers (Security, PQ)
  - Customer Connection

**LDC must be consistent in application of criteria/rules for CIAs**

**Technical requirements ensure:  
safety, reliability, power quality and system integrity**

# Technical Limits & Update

- More generation than load at many supply stations: 60% Reverse Flow (RF) limit applies
- Recent studies indicate 60% RF limit may be too high for some supply stations
- Feeder limit of 400 A - respects reliability of supply to all customers
- Short-circuit limit per Transmission System Code (TSC) must be respected
- Working with evolving technology, models, criteria, transmission & distribution interaction, etc.



# Technical Limits & Update – Cont'd

- Continue to engaged both transmission & distribution technical experts and universities to address issues
- Working with IESO on transmission impact where reverse flow at TS exceeds 10 MW



# Regulatory Challenges & Update

- Since the Codes do not address mutual T&D impact scenarios, CIAs also identify local transmission impact
- Lack of clarity in the Codes on cost allocation for multiple beneficiaries of upgrades – developed cost allocation rules
- Standard timelines in DSC not designed for SOP – additional resources & training has allowed quicker turnaround times



# Procedural Challenges & Update

- Repeating CIAs due to changes in turbine type, major equipment, connection location, or project size
  - Longer delays for those that are waiting
- Updated queue information is posted on Hydro One website
- Providing technical and non-technical specific information to project owners

# Activities Ongoing & Planned

- Substantial additional resources have been brought in to expedite work (on both technical & non-technical sides)
- Working with the OPA to ensure coordination with future procurement initiatives
- Interfacing with the OEB on Code & Queue clarification matters
- Interfacing with the IESO on transmission impact due to reverse flow



# Projects up to 500 kW

## What Exists?

- Enhanced process to further expedite assessments & cost estimating
- Working with project proponents to find low cost protection alternatives to reduce connection cost
- R&D initiatives involving universities, equipment manufactures and in-house experts to further reduce connection costs

## What's New?

- Projects can be moved up in the queue if the projects ahead in the queue not willing to downsize
- Can also apply to projects >500kW; smaller projects likely to benefit more

**THANK YOU!**

**ANY QUESTIONS?**