



Updating Infrastructure for New Generation

Making Green Energy Happen

Policies and Priorities Workshop

April 27, 2009

Green Energy Act

- Move Ontario to a greener economy and create new jobs
- Put Ontario's electricity supply mix on a green basis
- Encourage community power development
- Enhance conservation

Implications for Wires Infrastructure

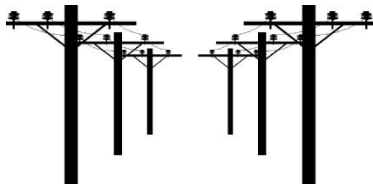
- Green Energy Act envisions substantial increase in renewables in the supply mix
- Most renewables (except some solar and landfill gas) are distant from major load
- New renewable generation will require major increases in enabling wires systems

Feed-In Tariff

- Standard offer
- Prices differentiated by size, technology and (in some cases) type of proponent
- Applicable to both transmission and distribution
- “Right to connect” but subject to economics
- Constraints will be respected but transmitters and distributors obligated to respond where economic

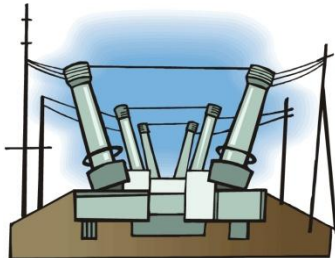
Summary of Technical Limitations Affecting Distributed Generation

Distribution System Constraints



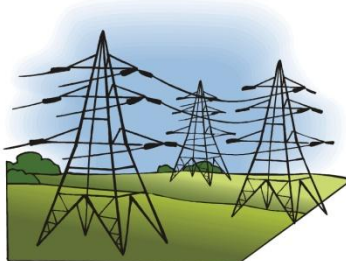
- Lack of real-time distribution system monitoring, protection, control, and telecommunication
- Limits on Distribution Lines

Transformer Station (TS) Constraints



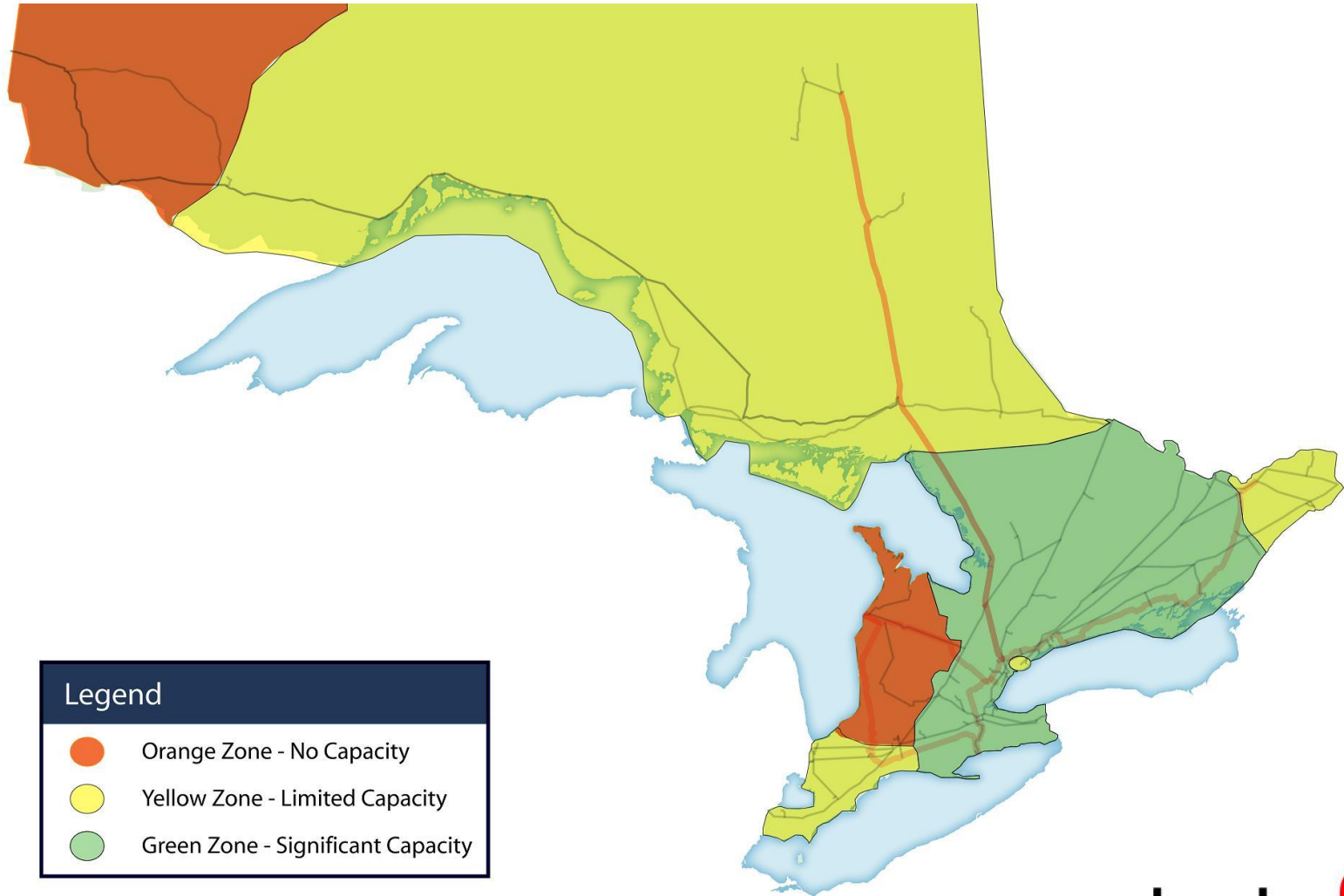
- Reverse flow at TS need Protections
- Equipment limitations at existing TS
- IESO Requires Dynamic Voltage Support

Transmission System Constraints



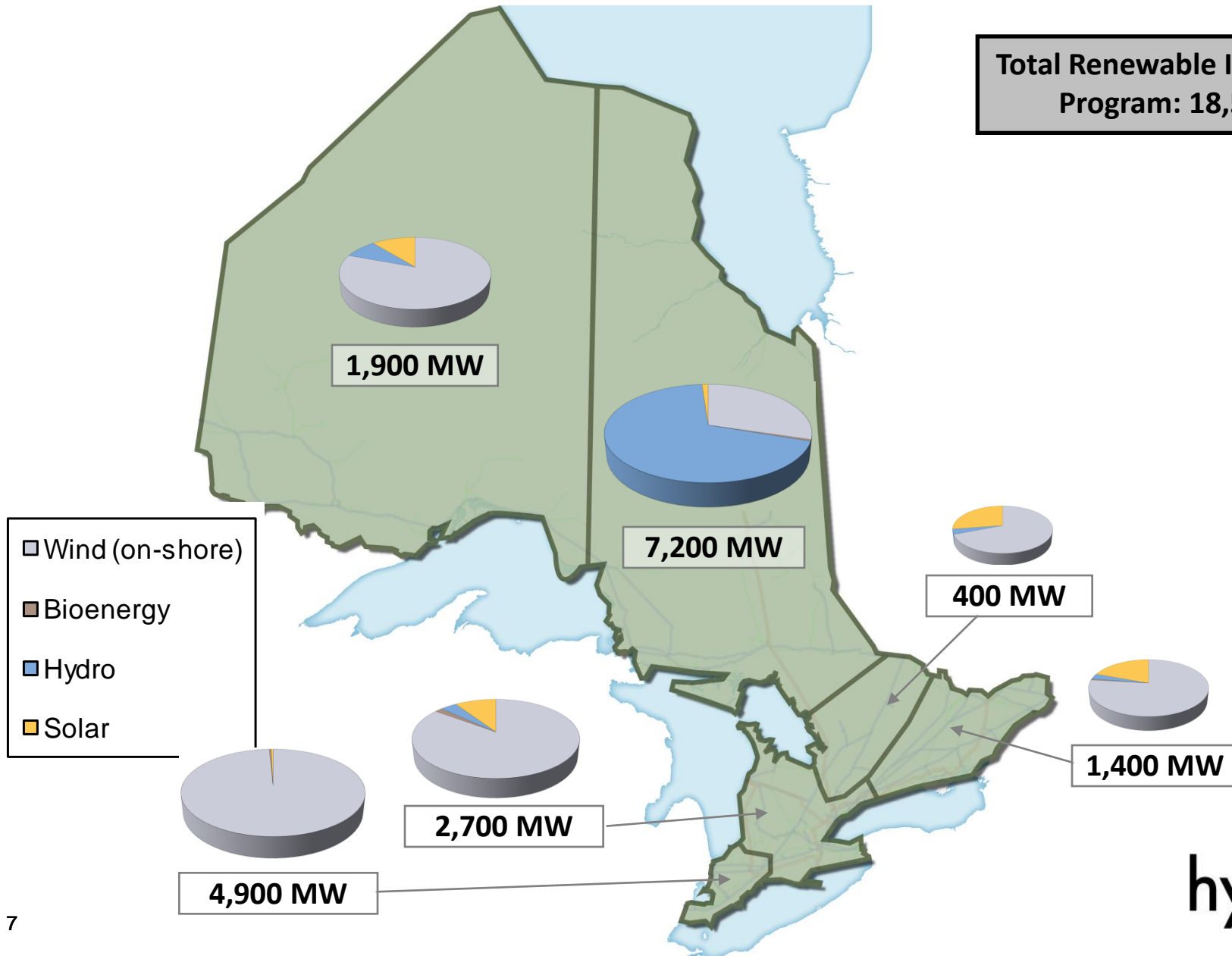
- No transmission in the area of the distributed generator
- Inadequate transmission in the local area and for inter-area transfers

Context – Transfer Capability Constraints



Currently Identified Renewable Interest

Total Renewable Interest in FIT Program: 18,500 MW



Actions to Enable DG

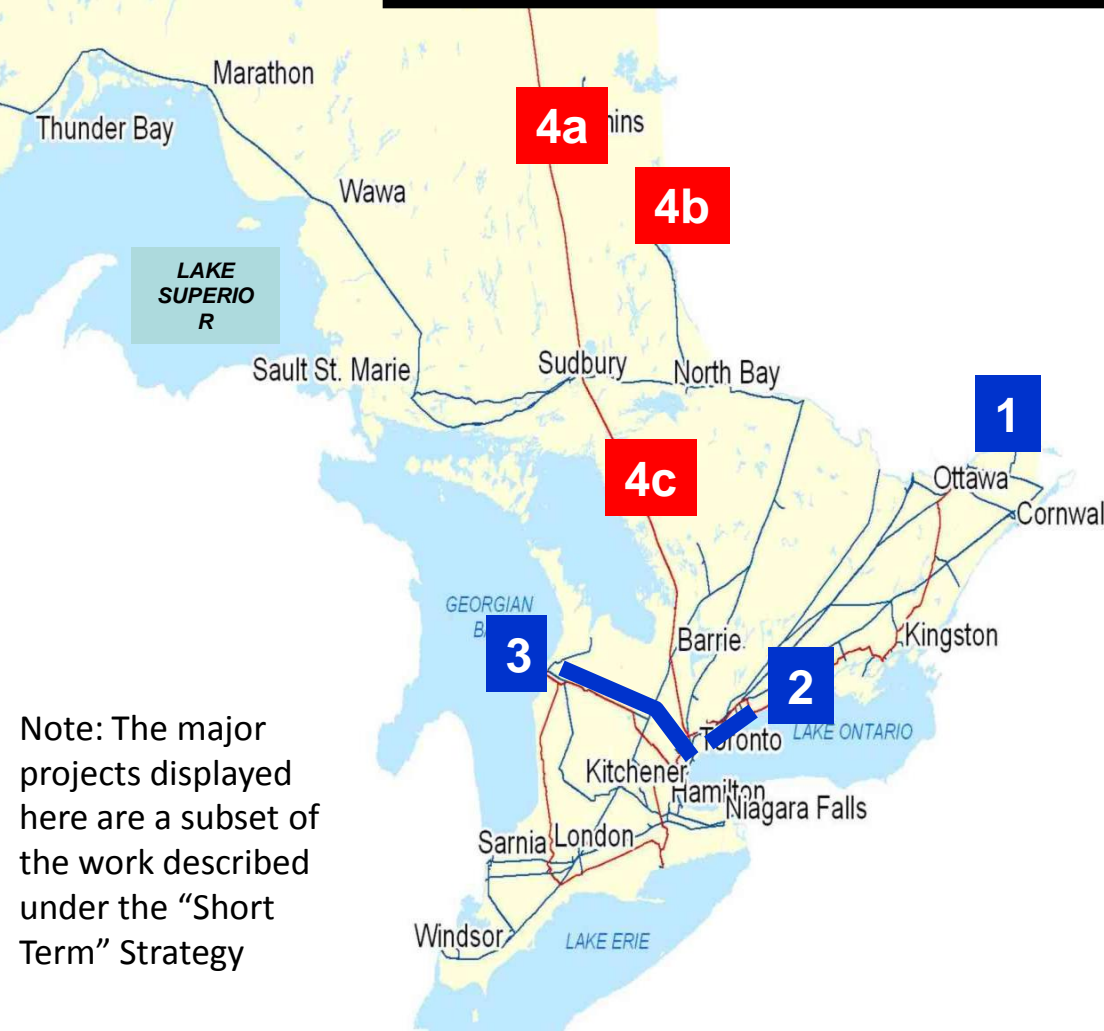


1. Make targeted investments, where transmission capability, is available to:
 - Expand distribution network where high demand exists
 - Provide telecom, protection and control infrastructure
 - Enable increased use of existing transformer capacity
 - Provide voltage support across wide areas of the grid
2. Expand transmission capability
3. Promote policy and regulatory changes

Major Near-Term Inter Area Transmission Projects



Results in 6,350 MW of new transfer capability, of which 1500 MW is reserved for Bruce, 1250 MW for HQ imports and 450 MW for Mattagami expansion. The remaining 3150MW is available for other generation including DG.



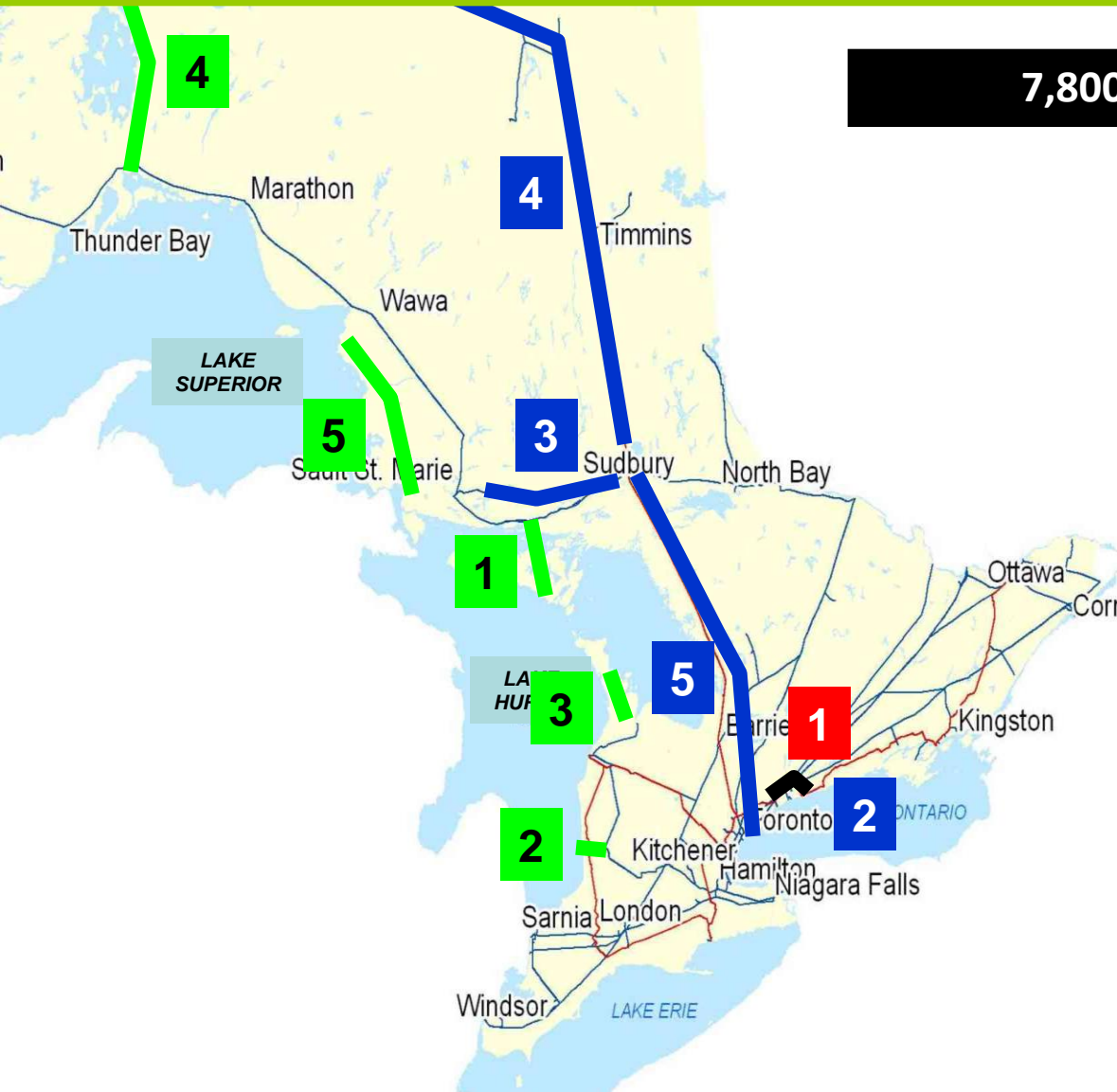
1. Ontario-Quebec Interconnection (2009) \$130M 1250 MW
2. Claireville x Cherrywood Reinforcement (2010) \$110M 1200 MW + HQ import
3. Bruce x Milton 500kV line (2011) \$635M 3,100 MW
4. North South Reinforcement \$150M 800 MW
 - a. Porcupine (Timmins) SVC
 - b. Kirkland Lake SVC
 - c. Nobel SC

Note: The major projects displayed here are a subset of the work described under the “Short Term” Strategy

Transmission Projects per IPSP



7,800MW of transfer capability.



Bulk Transmission Projects

1. "Oshawa Area" TS
2. Bowmanville x Cherrywood x Parkway
3. Sudbury West
4. Sudbury North
5. Sudbury South

Enabler Lines

1. Manitoulin
2. Goderich
3. Bruce Peninsula
4. Lake Nipigon

Future Projects



- Minister's directive to OPA looks for more and faster progress
- Several substantial constraints still to be addressed
 - particularly where renewable interest high
- Hydro One working with OPA on additional transmission
- Hydro One also focussing on other enabling investments

Who should pay for T&D Upgrades?

Should certain types of projects or proponents be given priority? (e.g., biodigesters, First Nations)

Should certain locations be given priority?

How do we ensure projects which are not moving are not blocking viable projects behind them?

How do we streamline approvals processes?