

Drivers to Transmission Investments and Performance in Ontario

October 28, 2002

IPPSO

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Scope of this presentation

- What Ontario got right in Transmission
- How do we recognize signs of stress in infrastructure?
- What Ontario still has to work on in Transmission
- Significance of these issues to IPPs

Who does what in Transmission

1. Role of the provincial government

- Draft and enforce Legislation and regulation.
- Owner of assets

2 Role of the NEB

- Approval of international facilities

3. Role of the OEB

- Grant Transmission Licence
- Approve Transmission revenue requirements and rates
- Issue and enforce Transmission System Code

Who does what in Transmission

4. Role of the IMO

- Direct operations, provide access, collect charges for owners

5. Role of Transmission Customers

- Enter into operating and Connection Agreements

6. Role of Transmission Owners

- Asset management , operation, expansion
- Partners in planning and congestion relief
- Merchant investments

What Ontario got right on Transmission

- Separate transmission companies
- Access rules to the network
- Pricing
- Integrated rates for four transmitters
- Consistent regulatory treatment

What we still have to work on

- Investment climate
- Incentives for Performance
- Interregional coordination
- Transmission expansion planning
- Coordination of generator and transmission planned outages

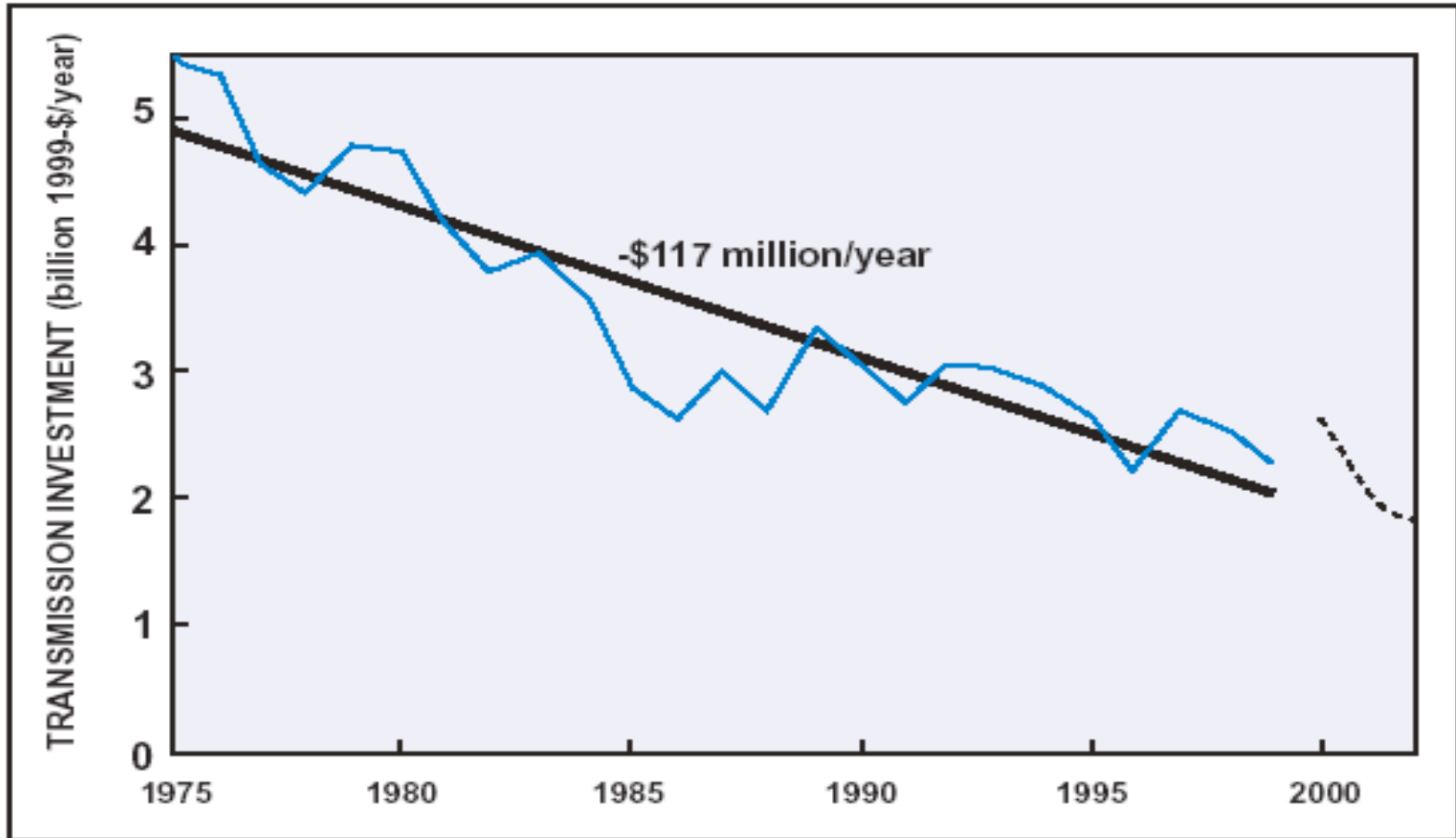
Markets are based on infrastructure

- More obvious in the case of Generation; less apparent, but even more important in the case of Transmission.
- Transparency of “transportation” is essential for the liquidity of the Commodity.
- Implications of Transmission scarcity are complex and take time to show up, recognize ,and correct
- Systems were designed to serve local needs; pressed now into “ Regional duty”

How would we know if Transmission is adequate?

- Extent of delivery point interruption
- Congestion (frequency, duration and impact)
- Transmission Loading relief (TLR) frequency
- Feasibility and cost of connecting new customers (Load and Generation)
- Extent of access to wider regional markets

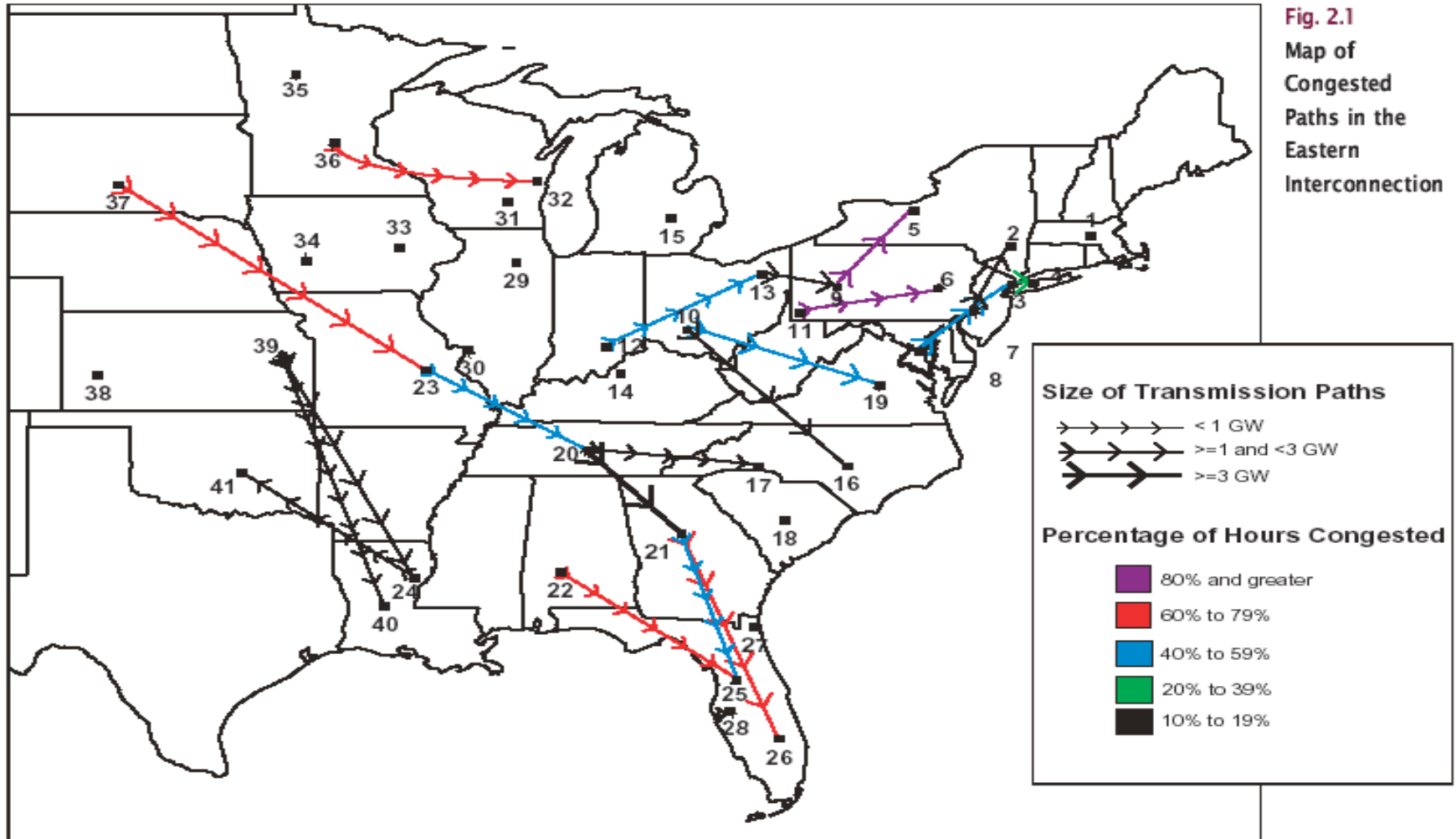
Transmission investment over time



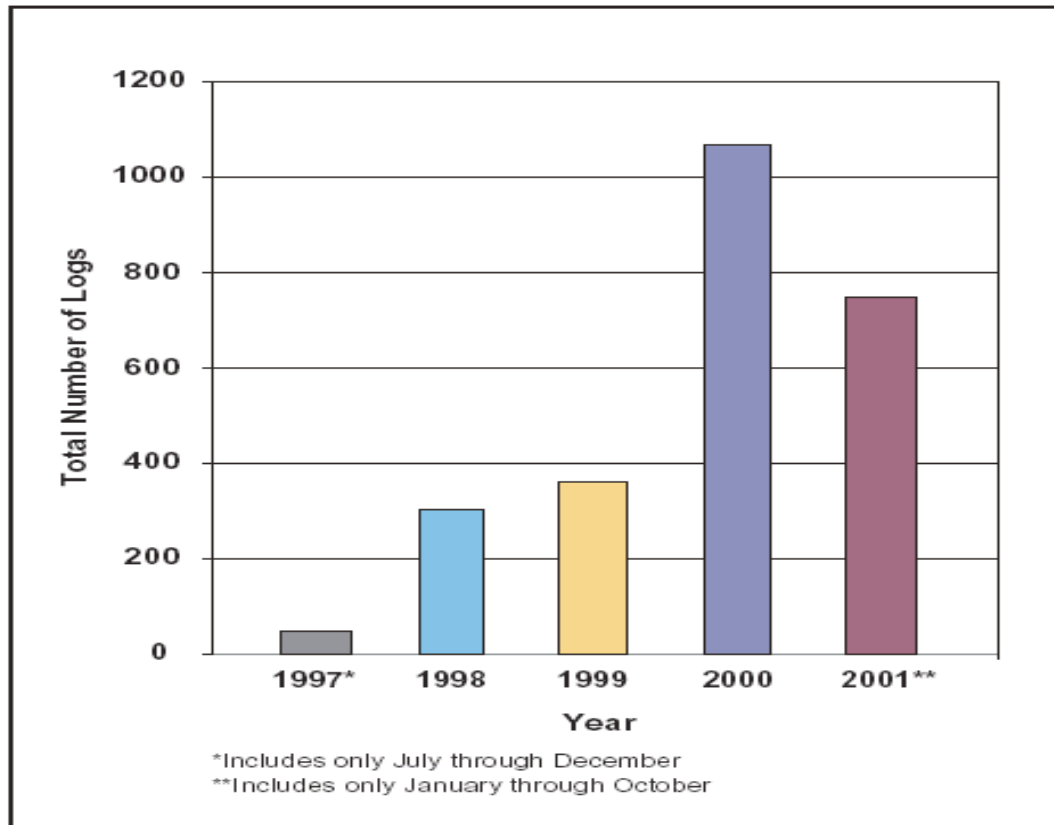
Investment in new transmission facilities has declined steadily for the last 25 years.

Source: E. Hirst and B. Kirby. 2001. *Transmission Planning for a Restructured U.S. Electricity Industry*. Edison Electric Institute.

Congested paths in the Eastern Interconnection



Transmission Loading Relief events over time



Actions by operators to curtail proposed transactions in order to ensure reliability according to procedures developed by the North American Electric Reliability Council have increased dramatically since the time they were first adopted in 1997.

Source: NERC.

The trend in Ontario is similar

- No significant “new” transmission for many years
- Congestion costs for first four months of markets are around \$75 Million
- Uncertainties around Major interconnection projects : Lake Erie, Quebec interconnection, phase shifters
- Market Surveillance Panel has concerns

Some of the improvements will come from increasing utilization

- The ‘Load factor’ for major transmission is around 20-40%
- Gas generation is locating near load centres
- Technology advances are enabling higher utilization of current assets
- Expansion of capability is likely to come from solutions other than major new lines

U.S. regulatory momentum

- Recognition of the need for planning
- Merits in standardization of interconnection procedures
- Increased significance of inter-regional coordination
- Heightened awareness on need for investments
- Shared authorities between states and FERC

Encouraging signs on incentives for Transmission performance

- Performance Measures are addressed partly in codes and partly in rate orders
- Hydro One started stakeholdering on PBR for Transmission
- Increasing appreciation of the significance of transmission adequacy and performance

Network performance measures

- There is general acceptance of “Delivery Point” reliability measures and possible standards.
- There is less consensus on what constitutes Network efficiency measures, and contribution to market efficiency measures: e.g. outage co-ordination, reduction of losses, uplift and congestion.

Of most significance to IPPs

- Connection procedures and rules
- Technical and regulatory requirements
- Cost allocation : between developers, and between developers and Transmission customers
- Extent of congestion, access, losses

Transmission Planning

- IMO current emphasis is on forecasting, identifying need and evaluation of proposals
- IMO can request proposals to come forth (e.g. Toronto)
- IMO authorities clearer when reliability is at risk
- There is less clarity and acceptance when efficiency is at risk

Inter-regional coordination frontier is complex

- Removal of multiple export rates (pancaked rates)
- Joint planning with New York, Michigan and other regions .
- Coordination (information, outages, calculation of available transmission)
- Shared investments

Conclusions

- Ontario has a good base to proceed from
- Framework not yet fully in place to incent performance and investments
- Role of various entities is clarifying
- Interregional transmission coordination will increase in significance

Elements of the Ontario planning process for transmission adequacy

- Annual assessment process (10-year Outlook)
 - IMO assesses resource adequacy and identifies market participant plans and forecast system constraints
 - IMO solicits voluntary responses to constraints (all resource types, including merchant and regulated transmission)
 - IMO assesses whether it must intervene to augment voluntary market responses to address constraints

Planning process (cont'd)

- If situation warrants IMO intervention:
 - IMO issues RFP to all market participants and DFP to applicable Transmitter(s)
 - Responses (if any) are assessed by IMO for technical feasibility, and submitted to OEB review and approval
 - Assessment includes associated system (grid) upgrades
 - Currently there is no provision for the IMO to optimize among solutions, conduct cost-benefit analysis and select a preferred alternative
 - If urgency warrants, IMO issues only DFP to applicable Transmitter(s) (who must submit a feasible solution)
 - IMO assesses the DFP response, and project proceeds to OEB review for approval
 - Environmental approvals may be required

Planning process (cont'd)

- Market participants may at any time file “spontaneous” applications for new resources
 - Independent of the IMO’s annual assessment process
 - Includes Generators, Demand Resources, Transmitters (merchant and regulated)
 - IMO assesses via CAA (Connection Assessment and Approval) process
 - includes Preliminary Assessment and System Impact Assessment
 - IMO recommendation forwarded to OEB for approval (Leave to Construct)
- Note: Currently, the IMO can identify and solicit solutions for congestion constraints, but cannot intervene to force a solution

Draft NERTO planning process



- Annual Plan
 - Early stages similar to that for Ontario
 - Planning Advisory Committee
 - Plan updated as necessary
 - Upgrades: reliability vs economic vs connection
 - Coordination with plans of interconnected RTOs
- System enhancement and expansion studies
- RFPs to construct upgrades
 - TO technical specs; NERTO selection criteria
 - NERTO selects (major projects); 3rd party review
 - Smaller projects exempt from RFP