



Ontario Power Authority

43.6

F12

Ontario Energy Board	
FILE No.	FB-2010-0002
EXHIBIT No.	K3.6
DATE	Sept. 23, 2010
	PS, KA, PC, JL, HT
08/99	

ONTARIO POWER AUTHORITY



May 19, 2010

The Economic Connection Test - Approach, Metrics and Process

Presentation Outline

1. Introduction (Bob Chow)
2. Network Expansion Planning and Economic Assessment (Chris Codd and Nicole Hopper)
 - Network expansion planning
 - Congestion
 - Economic metrics
3. ECT Process (Tracy Garner)
 - ECT process and upcoming schedule
 - Enabler formation process
 - Increasing system capability
 - Examples
4. Hydro One Transmission Connection Process and Cost Responsibility (Philip Poon)
5. Closing Remarks (Bob Chow)

Purpose of the Economic Connection Test (ECT) Process

- The ECT process will identify economic transmission expansion projects to enable additional renewable generation and will trigger development work to be carried-out by Transmitters under OEB oversight
- The ECT process intends to:
 - Balance the right-to-connect and the provincial ratepayer impact of transmission investment
 - Prioritize economic expansion projects
 - Coordinate transmission and distribution expansion plans
- The ECT is an ongoing process for assessing economic transmission system developments to connect FIT applications that could not be accommodated on the existing transmission system (i.e., those in the FIT Reserve)

Transmission Asset Categories and Cost Responsibilities

- The transmission system assets are categorized, with corresponding cost responsibilities, as follows:
 1. Network facilities – costs to be borne by all provincial ratepayers
 2. Connection facilities – costs to be borne by the triggering generator customer(s)
 3. Enabler facilities – a hybrid cost sharing model
- ECT will take into account cost responsibility rules as defined by:
 - The Transmission System Code
 - The Distribution System Code

Enabler Facilities

- As defined in the Transmission System Code (TSC), an enabler facility is a connection facility intended to connect a multi-proponent cluster of renewable generation resources
 - Enabler facilities would be developed, built, operated and owned by a transmitter
 - Can consist of either a transmission line or a transformation facility
- An enabler facility has an OEB-approved cost allocation structure
 - The costs associated with an enabler facility would be pooled temporarily
 - Each generator would make a pro-rata capital contribution towards the cost of the enabler facility, calculated as a share of the cost of the enabler facility equal to the generation facility's nameplate capacity
 - Outstanding costs for any “unsubscribed” portion of an enabler facility would be included in the transmitter's rate base and be recovered from ratepayers

Definition: Network vs. Connection Facilities

- TSC provides definition
- Network facilities are:
 - Facilities, other than connection facilities, that form part of a transmission system that are shared by all users
 - Comprised of network stations and the transmission lines connecting them
- Connection facilities are:
 - Facilities that connect loads and generators to a transmitter's transmission system
 - Comprised typically of:
 - Line connections - radial lines that do not connect network stations and whose sole purpose is to serve one or more persons
 - Transformation facilities – transformers tapped off a transmission system, that step down voltages to distribution levels

Cost Allocation: Network vs. Connection Facility

- TSC provides the framework for cost allocation
- For network facilities:
 - Cost is generally allocated to the transmission network pool which is ultimately passed on to all ratepayers
- For connection facilities:
 - Cost is allocated to the connecting generator or load customer
- For dual function lines:
 - Cost is shared between network and connection pools based on connection line capacity and connected load

Increasing Circuit Capability

- A number of circuits with limited segments have been identified
- If the segment is a network facility, the OPA will carry out economic assessment on the ratepayer investment
- If the segment is a connection facility, the OPA will work with the asset owner (transmitter) and the related FIT applicants to facilitate upgrade planning
 - Costs for connection facility upgrades will be recovered from the FIT applicants who trigger the required upgrade

Increasing Transformer Station Capability

- Many distribution connected FIT applications are limited at the transformer station level
 - Many of the limited transformer stations are transmitter owned, and considered connection assets
- During the ECT, the OPA will work with the applicant's LDC and the station asset owner (where it is not the applicant's LDC) to initiate development work for a potential upgrade
 - Asset owner may be an LDC, or a transmitter
 - This step may include meetings between applicants, LDCs and transmitters, coordinated by the OPA, during the ECT period

Increasing Transformer Station Capability (2)

- Where the transformer station is owned by a transmitter and considered a connected asset, the cost of the upgrade will be recovered from the FIT applicant(s) who triggers the upgrade
 - Cost will be passed on to the FIT applicant via the applicant's LDC
- Once an upgrade is identified the LDC or transmitter will proceed through the planning process, according to OEB Codes and other planning guidelines
 - The OPA will integrate information from the LDC or transmitter to determine the status of FIT applications at the end of the ECT

Increasing Transformer Station Capability (3)

- Where the TS capability upgrade is to be carried out as a transmission connection asset, and there are no network facility upgrade requirements (for example, to increase capability at the area level), a FIT application can be moved directly from the FIT Reserve to FIT contract offer at the end of the ECT
 - Costs for connection asset upgrades will be recovered from the FIT applicant(s) who triggers the upgrade
 - No ratepayer investment would be required to connect this FIT applicant, so there is no economic assessment required in the ECT
- Where the required station capability upgrade is to be carried out by an LDC, the FIT applicant will be moved to the FIT Production Line until regulatory approval is received for the planned distribution system upgrades



Hydro One Transmission Connection Process and Cost Responsibility for Renewable Generation

**Presented by Philip Poon
Hydro One Networks Inc.
May 19, 2010**



Transmission Connection Upgrades

- OPA's FIT Reserve review process may reveal that transmission upgrades to connection facilities are required to connect a generator proponent
 - Connection upgrades are generally identified during the customer connection process
 - Connection upgrade costs would likely be the generator's responsibility



Cost Responsibility

- Cost responsibility rules are set out by the OEB in the TSC.
- These rules apply to transmission facilities that are provided by the transmitter --- NOT to the generator's own dedicated facilities (which are self-provided).



Cost Responsibility Categories

Type	Transmission Facility	Cost Responsibility*
Network	Network	Network Pool
Connection	Enabler	Connection Pool + Generators (<i>Hybrid Cost Model</i>)
	Non-Enabler	Generators

*Some exceptions apply (e.g. minimum connection requirement, TSC 6.3.6)



Single Proponents

- Where a single proponent requires upgrades to existing connection facilities, the proponent can work directly with the IESO and the transmitter.
 1. Must have FIT contract award per OPA rules
 2. Hydro One's Transmission Connection Process
 3. IESO's Connection Assessment Process
- Proponent would generally be expected to fund the transmission connection upgrades



Multiple Proponents

- Where multiple proponents are involved, there is an additional consideration relating to shared cost responsibility.
- One of three scenarios may apply:
 - Enabler (Hybrid Cost Model)
 - Pay upfront...with potential rebate later
 - OPA may facilitate cost sharing discussions
- What do these entail? See next slide...



Multiple Proponents

- **Enabler**
 - The OPA may consider recommending to the OEB that enabler treatment of the facility be applied if it meets certain screening criteria
 - Subject to OEB approval, each proponent pays pro-rata share
- **Pay upfront...with potential rebate later**
 - First proponent would fund the necessary connection upgrades per the TSC, and then would be eligible for rebates funded from the contributions of subsequent benefitting proponents



Multiple Proponents

- OPA may facilitate cost sharing discussions
 - With OPA coordination of proponents, transmitters and/or distributors, a cost sharing arrangement may be facilitated
 - Some of this coordination may occur at the pre-FIT contract stage



Implications for Proponents of Distribution-Connected Projects

- Distribution proponent would be a distribution customer of the distributor
- The distributor would in turn be a transmission customer of the transmitter (or sometimes a customer of a host distributor)
- Transmission modifications may be required to accommodate distribution-connected generators
- Costs of any upstream upgrades to the system of a host distributor or a transmitter would be passed on to the distributor; these costs are then passed by the distributor on to the distribution-connected generator



Distribution Cost Responsibility

Type	Investment Type	Cost Responsibility
Transmission	Upstream (Transmitter)	Generator
Distribution	Upstream (Host Distributor)	Generator
	Connection	Generator
	Expansions	Costs up to a "Renewable Expansion Cost Cap" of \$90,000 per MW: Distributor Costs in excess of Cap: Generator Costs of expansions included in an OEB-approved plan: Distributor
	Renewable Enabling Improvements ("REI")	Distributor



Key Messages

- Cost responsibility rules are set out in the Transmission System Code
 - Generators are generally expected to pay for upgrades to transmission connection facilities
 - Upstream transmission and host distributor costs are passed by the distributor to the distribution-connected generator
- Transmission Connection Processes
 - IESO and Hydro One