

ATTACHMENT TO GTA EAST SCOPING ASSESSMENT OUTCOME REPORT

TERMS OF REFERENCE FOR AN INTEGRATED REGIONAL RESOURCE PLAN IN THE “PICKERING-AJAX-WHITBY” SUB-REGION

1. Introduction and Background

The Pickering-Ajax-Whitby Sub-Region is within the GTA East Region (“Region”). Consistent with Ontario Energy Board’s (“OEB”) formalized regional planning process, Hydro One has carried out a Needs Screening for the GTA East Region. The Needs Screening Summary Report indicated that station capacity needs are forecasted in the Pickering-Ajax-Whitby area and load restoration requires further assessment. The Scoping Assessment led by the Ontario Power Authority¹ (“OPA”) with Hydro One Transmission Inc. (“Hydro One Transmission”), the Independent Electricity System Operator (“IESO”) and LDCs in the Region has concluded an Integrated Regional Resource Plan (“IRRP”) be undertaken to address the needs in this Sub-Region. The adjacent area within the GTA East Region, Oshawa-Clarington, is not within the scope of the IRRP as the Needs Screening concluded that there is no further need for regional coordination to address the needs identified within that area.

These Terms of Reference (“ToR”) establish the objectives, scope, data requirements, Working Group, accountabilities, deliverables and timelines for an IRRP in the Pickering-Ajax-Whitby Sub-Region. The study area includes the parts of the City of Pickering, Town of Ajax, and Town of Whitby which are currently served by the Cherrywood TS 230/44 kV step-down transformers, Whitby TS and a portion of Thornton TS.² Distribution service to customers in the area is provided by Veridian Connections Inc. (“Veridian”), Whitby Hydro Electric Corporation (“Whitby Hydro”), and Hydro One Distribution as a host distributor for some Veridian and Whitby Hydro facilities.

The Cherrywood TS 230/44 kV step-down transformers are located within the same station facility which provides a major 230 kV source of supply to other regions in the GTA and a connection point for the Pickering nuclear generation station. The Whitby TS is connected to the 230 kV circuits east of Cherrywood TS (M29C, B23C, H24C, and H26C). The net coincident peak demand of the two stations in summer 2013 was approximately 390 MW.

The 230 kV transmission circuits connecting other transformer stations in the area that will be assessed in terms of the ability to restore loads following a loss of two elements within the times required in the Ontario Resource Transmission Assessment Criteria (“ORTAC”) include:

- M29C and B23C that supply Whitby TS T3/T4 and Wilson TS
- H24C and H26C that supply Whitby TS T1/T2 and Thornton TS, as well as transmission-connected industrial loads.

¹ On January 1, 2015, the Ontario Power Authority (“OPA”) merged with the Independent Electricity System Operator (“IESO”) to create a new organization that will combine the OPA and IESO mandates. The new organization is called the Independent Electricity System Operator.

² Part of the Townships of Uxbridge and Scugog are also in the study area.

As recommended in the Needs Screening Report, the IRRP will also consider the utilization of any available capacity in the Region, such as Whitby TS T3/T4 and Whitby TS T1/T2 44kV, as potential options to address the identified needs. Figure 1 shows the two Sub-Regions within the GTA East Region: Pickering-Ajax-Whitby which is within the scope of the IRRP, and the adjacent Oshawa-Clarington. The Oshawa-Clarington Sub-Region is not within the scope of the IRRP.

Figure 1: Location of Pickering-Ajax-Whitby IRRP Study Area



Note: Some Whitby Hydro load is supplied by Thornton TS in Oshawa.

Source: OPA

2. Objectives

1. To assess the adequacy of electricity supply to customers in the Pickering-Ajax-Whitby Sub-Region over the next 20-year period, from 2015-2024.
2. To develop an integrated plan focusing on near-term requirements and solutions (within the next 5 years), mid-term optionality (5-10 years out) and long-term direction (10-20 years in the future).
3. To develop an implementation plan for the recommended options, while maintaining flexibility in order to accommodate changes in key assumptions over time.

3. Scope

The IRRP will develop and recommend options to meet supply needs of the Pickering-Ajax-Whitby Sub-Region in the near, medium and long term. The IRRP is a joint initiative involving the OPA, Veridian, Whitby Hydro, Hydro One Distribution, Hydro One Transmission, and the IESO, and will incorporate

input from other stakeholders as required. The planning process will account for load growth projections, conservation and demand management in the area, transmission and distribution system capability, relevant community plans, renewable energy resources and other generation uptake, and will develop an integrated plan to address needs.

The OEB's regional planning process requires greater emphasis on developing a plan to cover the 10 to 20-year period. In order to account for uncertainty in this longer-term time horizon, the Working Group will use a scenario-based approach to long-term forecasting. The longer-term demand scenarios will be developed based on economic drivers of electricity demand, such as growth in GDP and population, behavioural change in response to rising electricity price, as well as any relevant community and municipal plans.

The Working Group will develop options to meet the area's long-term electricity demand based on three main types of approaches. These approaches are:

- a) Community self sufficiency where a combination of Conservation and Demand Management ("CDM") and distributed generation keep future reliance of electrical demand from the transmission system within existing levels;
- b) Provincial supply where growth in electrical demand is served by the provincial generation mix via the transmission system to the area; or
- c) A combination of (a) and (b).

Community and stakeholder feedback will be sought on options that focus on local resources to support community self sufficiency or the delivery provincial resources to meet area needs.

4. Data and Assumptions

The IRRP will consider the following data and assumptions.

- Demand Data
 - Historical coincident peak demand information for the area (OPA)
 - Historical weather correction, median and extreme conditions
 - Gross peak demand forecast by TS (LDCs) (median weather conditions)
 - Coincident peak demand data including direct-connected transmission customers
- Conservation and Demand Management
 - Incorporation of verified LDC results and progression towards OEB targets, and any other CDM programs in the area
 - Long-term Conservation forecast-based on sub-region's share of LTEP 2013 target
 - Detailed Conservation implementation plans, if applicable (LDCs, OPA)
 - Conservation potential studies
 - Conservation plans from municipalities and regions
- Demand Response ("DR")
 - Existing and future DR procurements within the area
 - DR potential studies

- Distributed Generation (“DG”)
 - Existing distribution connected generation, including DG facilities, district energy, merchant generators and Non-Utility Generation (“NUG”) contracts
 - Existing or committed renewable generation from FIT and non-FIT procurements
 - Future district energy plans, CHP or other generation proposals
 - DG/CHP potential studies
- Relevant community plans, as applicable
 - LDC Distribution System Plans (“DSP”)
 - Community Energy Plans (“CEP”) and Municipal Energy Plans (“MEP”)
- Criteria, codes and other requirements
 - Based on the Ontario Resource and Transmission Assessment Criteria (“ORTAC”)
 - Supply capability
 - Load security
 - Load restoration requirements
 - Transmission System Code
 - Distribution System Code
 - NERC-Defined Bulk Electric System (“BES”) Planning Performance Requirement
 - Other applicable requirements
- Existing system capability
 - Transmission line ratings as per transmitter records
 - System capability as per current IESO PSS/E base cases
 - Transformer station ratings (10-day LTR) as per asset owner
 - Load transfer capabilities (LDCs)
- End-of-life asset considerations/sustainment plans
 - Transmission assets
 - Distribution assets
- Other considerations, as applicable
 - Distribution-level reliability performance
 - Committed assets coming into service during study period

5. Working Group/Authority/ Funding

Working Group

The core Working Group will consist of planning and engineering representatives from the following organizations:

- Ontario Power Authority (*Team Lead for IRRP*)
- Hydro One Transmission
- Independent Electricity System Operator

- Veridian Connections Inc.
- Whitby Hydro Electric Corporation
- Hydro One Distribution

Support will be requested from other groups as required.

Input from other entities such as large transmission connected industrial customers will be sought from the transmitter as required.

Authority

Each entity involved in the study will be responsible for complying with regulatory requirements as applicable to the actions/tasks assigned to that entity under the implementation plan resulting from this IRRP.

Funding

For the duration of the study process, each participant is responsible for their own funding.

6. Activities and Primary Accountability

- Prepare draft Terms of Reference (*OPA*)
 - Review and Finalize Terms of Reference based on stakeholder input (*OPA*)
- Establish demand data including:
 - Gross forecast (*LDC*)
 - Net Forecast-includes establishing conservation and DG to include in forecast (*OPA*)
 - Develop long-term forecast scenarios (10-20 years) (*OPA*)
- Provide information on load transfer capabilities under normal and emergency conditions (*LDCs*)
- Establish existing, committed and potential DG (*OPA and LDCs*)
- Provide relevant community plans / community energy plans (*LDCs*)
- Complete system studies to identify needs (*OPA, Hydro One, IESO*)
 - Obtain PSS/E base case from IESO
 - Include bulk system assumptions as identified in Key Assumptions
 - Apply reliability criteria as defined in ORTAC
 - Confirm and refine the need(s)
- Identify near-term projects, if applicable
 - Hand-off letters to responsible parties to initiate near-term project/initiate development work, etc. (*OPA*)
- Develop medium and long-term alternatives (*All*)
 - Three possible approaches for framing long term alternatives:

- i. Self Sufficiency
 - ii. Provincial supply + transmission
 - iii. Combination
 - Options that will be considered:
 - i. Conservation alternatives (*OPA and LDCs*)
 - ii. Local/distributed generation alternatives (*OPA and LDCs*)
 - iii. Transmission or distribution alternatives including maximizing existing infrastructure capability (*OPA, transmitter and LDCs for Dx options*)
 - iv. Innovative technologies including smart grid and storage, etc. (*OPA/LDCs with support as needed*)
 - v. Study impact of options on bulk system capability (*OPA, transmitter, IESO*)
 - Evaluate options
 - i. Technical comparison and economic evaluation (All)
 - ii. Additional criteria to be developed through stakeholder engagement
- Community and Stakeholder engagement (All)
 - Develop communications materials
 - Engage with municipalities, First Nations and Métis communities, and the public
 - Carry out duty to consult, if applicable
 - Summarize input and incorporate feedback
- Develop long-term recommendations and implementation plan (*OPA*)
- Prepare the IRRP report detailing the recommended long-term plan for approval by all parties (*OPA*)
 - Conservation implementation plan
 - DG implementation plan
 - Monitoring activities and identification of decision triggers
 - Hand-off letters
 - Procedure for annual review

7. Deliverables of IRRP (as applicable)

- Hand-off letter(s) as required
- IRRP report
- Monitoring activities and identification of decision triggers

8. Study Schedule

An initial draft Schedule, based on the estimates to finish the IRRP process within 18 months, is presented as follows.

IRRP Initial Schedule	2014		2015												2016			
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Finalize Terms of Reference	■	■																
Establish Engagement subcommittee			■	■														
Forecast Scenario				■	■													
Needs Identification						■	■											
Development of Options								■	■									
IRRP/Engagement Document										■	■	■						
Community and Stakeholder Engagement								■	■				■	■				
Incorporate Feedback															■	■		
Finalize IRRP																	■	■