

## NEEDS SCREENING REPORT

**Region: GTA East**

**Revision: Final**  
**Date: August 11, 2014**

**Prepared by: GTA East Region Study Team**



| <b>GTA East Region Study Team</b>             |                                |
|---|--------------------------------|
| <b>Organization</b>                           | <b>Name</b>                    |
| Hydro One Networks Inc.<br>(Lead Transmitter) | Farooq Qureshy<br>Sachna Bobal |
| Ontario Power Authority                       | Steven Norrie                  |
| Independent Electricity<br>System Operator    | Phillip Woo                    |
| Veridian Connections Inc.                     | Craig Smith                    |
| Oshawa PUC Networks Inc.                      | Denise Flores                  |
| Whitby Hydro Electric<br>Corporation          | Kevin Whitehead                |
| Hydro One Networks Inc.<br>(Distribution)     | Charlie Lee                    |

**Disclaimer**

This Needs Screening Report was prepared for the purpose of identifying potential needs in the GTA East Region and to assess whether those needs require further coordinated regional planning. The potential needs that have been identified through this Needs Screening Report may be studied further through subsequent regional planning processes and may be reevaluated based on the findings of further analysis. The load forecast and results reported in this Needs Screening Report are based on the information and assumptions provided by study team participants.

Study team participants, their respective affiliated organizations, and Hydro One Networks Inc. (collectively, “the Authors”) make no representations or warranties (express, implied, statutory or otherwise) as to the Needs Screening Report or its contents, including, without limitation, the accuracy or completeness of the information therein and shall not, under any circumstances whatsoever, be liable to each other, or to any third party for whom the Needs Screening Report was prepared (“the Intended Third Parties”), or to any other third party reading or receiving the Needs Screening Report (“the Other Third Parties”), for any direct, indirect or consequential loss or damages or for any punitive, incidental or special damages or any loss of profit, loss of contract, loss of opportunity or loss of goodwill resulting from or in any way related to the reliance on, acceptance or use of the Needs Screening Report or its contents by any person or entity, including, but not limited to, the aforementioned persons and entities.

## NEEDS SCREEN EXECUTIVE SUMMARY

|   |                                       |                 |                 |
|---|---------------------------------------|-----------------|-----------------|
| <b>REGION</b>   | GTA East Region (the “Region”)        |                 |                 |
| <b>LEAD</b>   | Hydro One Networks Inc. (“Hydro One”) |                 |                 |
| <b>START DATE</b>   | June 12, 2014                         | <b>END DATE</b> | August 11, 2014 |
| <b>1. INTRODUCTION</b>  |                                       |                 |                 |
| <p>The purpose of this Needs Screening report is to undertake an assessment of the GTA East Region and determine if there are regional needs that require coordinated regional planning. Where regional coordination is not required, and a “localized” wires solution is necessary, such needs will be addressed between relevant Local Distribution Companies (LDCs) and Hydro One and other parties as required.</p> <p>For needs that require further regional planning and coordination, the Ontario Power Authority (OPA) will initiate the Scoping Assessment process to determine whether an OPA-led Integrated Regional Resource Planning (IRRP) process, or the transmitter-led Regional Infrastructure Plan (RIP) process (wires solution), or whether both are required.</p>              |                                       |                 |                 |
| <b>2. REGIONAL ISSUE/ TRIGGER</b>   |                                       |                 |                 |
| <p>The Needs Screening for the GTA East Region was triggered in response to the Ontario Energy Board’s (OEB) Regional Infrastructure Planning process approved in August 2013. To prioritize and manage the regional planning process, Ontario’s 21 regions were assigned to one of three groups - Group 1 Regions are being reviewed first. The GTA East Region was expedited at the request of the LDCs in the region and reprioritized from Group 2 to Group 1. The Needs Screening for this Region was triggered on June 12, 2014 and was completed on August 11, 2014.</p>   |                                       |                 |                 |
| <b>3. SCOPE OF NEEDS SCREENING</b>  |                                       |                 |                 |
| <p>The scope of this Needs Screening assessment was limited to the next 10 years because relevant data and information was collected up to the year 2023, as per the recommendations of the Planning Process Working Group Report to the Board.</p> <p>Needs emerging over the next 10 years and requiring coordinated regional planning may be further assessed as part of the OPA-led Scoping Assessment and/or IRRP, or in the next planning cycle to develop a 20-year IRRP with strategic direction for the Region.</p> <p>The assessment included a review of transmission system connection facilities capability, which covers station loading, thermal and voltage analysis, system reliability, operational issues such as load restoration, and assets approaching end-of-useful-life.</p> |                                       |                 |                 |
| <b>4. INPUTS/DATA</b>   |                                       |                 |                 |
| <p>Study team participants, including representatives from LDCs, the OPA, the Independent Electricity System Operator (IESO), and Hydro One transmission provided information for the GTA East Region. The information included: existing information from planning activities already underway, historical load, load forecast, conservation and demand management (CDM) and distributed generation (DG) information, load restoration data, and performance information including major equipment approaching end-of-useful life. See Section 4 for further details.</p>  |                                       |                 |                 |
| <b>5. ASSESSMENT METHODOLOGY</b>  |                                       |                 |                 |
| <p>The assessment’s primary objective was to identify the electrical infrastructure needs in the Region over the study period (2014 to 2023). The assessment reviewed available information and load forecasts and included single contingency analysis to confirm needs, if and when required. See Section 5 for further details.</p>  |                                       |                 |                 |

## 6. RESULTS

### Transmission Capacity Needs

#### A. 230kV Transmission Lines

- The 230kV circuits supplying the Region (B23C, M29C, H24C, and H26C) are adequate over the study period for the loss of a single 230kV circuit in the Region. No action is required at this time and the capacity will be reviewed in the next planning cycle.

#### B. 230kV Connection Facilities

- The following stations exceed their normal supply capacity in the near term for both Gross and Net demand forecasts. See Section 6 for further details:
  - Cherrywood TS T7/T8 (230/44kV)
    - Based on the net demand forecast, the station exceeds its normal supply capacity for 2014 and 2015 only. However, as enough CDM is implemented, net demand is reduced and does not exceed normal supply capacity from 2016 to the end of the study period.
  - Whitby TS T1/T2 27.6kV windings (230/44/27.6kV)
  - Wilson TS T1/T2 and T3/T4 (230/44kV)
  - Thornton TS T3/T4 (230/44kV)
    - Capacity of the Thornton T3/T4 transformers is currently limited to their Continuous Rating since they have been identified as gassing. Hydro One is scheduled to replace both of these transformers in 2015 with two new 75/100/125 MVA transformers.
- There is a need to review available station capacity and feeder capacity utilization in the GTA East Region in the next regional planning step in order to make efficient and cost effective use of available facility capacity.

### System Reliability, Operation and Restoration Needs

Generally speaking, there are no significant system reliability and operating issues identified for one element out of service in this Region.

Based on the gross coincident demand forecast, the loss of one element will not result in load interruption. The maximum load interrupted by configuration due to the loss of two elements is below the 600MW load loss limit by the end of the 10-year study period.

For the loss of two elements, the load interrupted by configuration may exceed 150 MW and 250 MW. Load restoration times require further assessment.

### Aging Infrastructure / Replacement Plan

During the study period, plans to replace major equipment do not affect the needs identified. Scheduled replacement of the T3/T4 transformers at Thornton TS will eliminate the existing transformer gassing issue.

## 7. RECOMMENDATIONS

Based on the findings of this Needs Screening assessment, the study team's recommendations are as follows:

- Some of the potential needs identified in Section 6 do not require further regional coordination. Rather, these needs can be adequately and efficiently addressed by Hydro One Networks Inc. and the relevant LDCs. See Section 7 for further details.
- Coordinated regional planning is further required to assess some of the potential needs identified in Section 6 of this report. Accordingly, the OPA should initiate the Scoping Assessment process for these needs. See Section 7 for further details.

---

## TABLE OF CONTENTS

|  |     |
|--|-----|
| Needs Screen Executive Summary .....                                   | iii |
| Table of Contents .....  | v   |
| List of Figures and Tables.....  | vi  |
| 1 Introduction.....  | 1   |
| 2 Regional Issue / Trigger.....  | 2   |
| 3 Scope of Needs Screening .....                                       | 2   |
| 3.1 GTA East Region Description and Connection Configuration.....      | 2   |
| 3.1.1 Clarington TS 500/230kV Autotransformer Station.....             | 4   |
| 4 Inputs and Data .....  | 5   |
| 4.1 Load Forecast.....   | 6   |
| 5 Assessment Methodology .....   | 6   |
| 6 Results.....   | 7   |
| 6.1 Transmission Capacity Needs.....                                   | 7   |
| 6.1.1 230kV Transmission Lines .....                                   | 7   |
| 6.1.2 230kV Connection Facilities.....                                 | 8   |
| 6.2 System Reliability, Operation and Restoration Review .....         | 10  |
| 6.3 Aging Infrastructure and Replacement Plan of Major Equipment ..... | 10  |
| 7 Recommendations.....   | 10  |
| 8 Next Steps.....  | 11  |
| 9 References.....  | 11  |
| 10 Acronyms.....   | 12  |

**LIST OF FIGURES AND TABLES**

Figure 1: GTA East Region Map ..... 3  
Figure 2: Single Line Diagram – GTA East Region..... 4  
Figure 3: Single Line Diagram – GTA East Region with Clarington TS..... 5  
  
Table 1: Study Team Participants for GTA East Region..... 1

# 1 INTRODUCTION

This Needs Screening report provides a summary of needs that are emerging in the GTA East Region (“Region”) over the next ten years. The development of the Needs Screening report is in accordance with the regional planning process as set out in the Ontario Energy Board’s (OEB) Transmission System Code (TSC) and Distribution System Code (DSC) requirements and the “Planning Process Working Group (PPWG) Report to the Board”.

Prior to this Needs Screening coordinated planning activities, which included participation from the Ontario Power Authority (OPA), Local Distribution Companies (LDC) and Hydro One Networks Inc., were already underway to address some of the GTA East Region’s station capacity needs. . The purpose of this Needs Screening report is to: consider the information from planning activities already underway; undertake an assessment of the GTA East Region to identify near term and/or emerging needs in the area; and determine if these needs require a “localized” wires only solution(s) in the near-term and/or a coordinated regional planning assessment. Where a local wires only solution is necessary to address the needs, Hydro One, as transmitter, with LDCs or other connecting customer(s) will further undertake planning assessments to develop options and recommend solution(s). For needs that require further regional planning and coordination, the OPA will initiate the Scoping Assessment process to determine whether an OPA-led Integrated Regional Resource Planning (IRRP) process, or the transmitter-led Regional Infrastructure Plan (RIP) process (wires solution), or both are required.

This report was prepared by the GTA East Region Needs Screening study team (Table 1) and led by the transmitter, Hydro One Networks Inc. The report captures the results of the assessment based on information provided by LDCs, the OPA and the Independent Electricity System Operator (IESO).

**Table 1: Study Team Participants for GTA East Region**

| No. | Company  |
|-----|--|
| 1.  | Hydro One Networks Inc. (Lead Transmitter)                     |
| 2.  | Ontario Power Authority  |
| 3.  | Independent Electricity System Operator                        |
| 4.  | Veridian Connections Inc. (“Veridian”)                         |
| 5.  | Oshawa Power and Utilities Corporation Networks Inc. (“OPUCN”) |
| 6.  | Whitby Hydro Electric Corporation (“Whitby Hydro”)             |
| 7.  | Hydro One Networks Inc. (Distribution)                         |



## **2 REGIONAL ISSUE / TRIGGER**

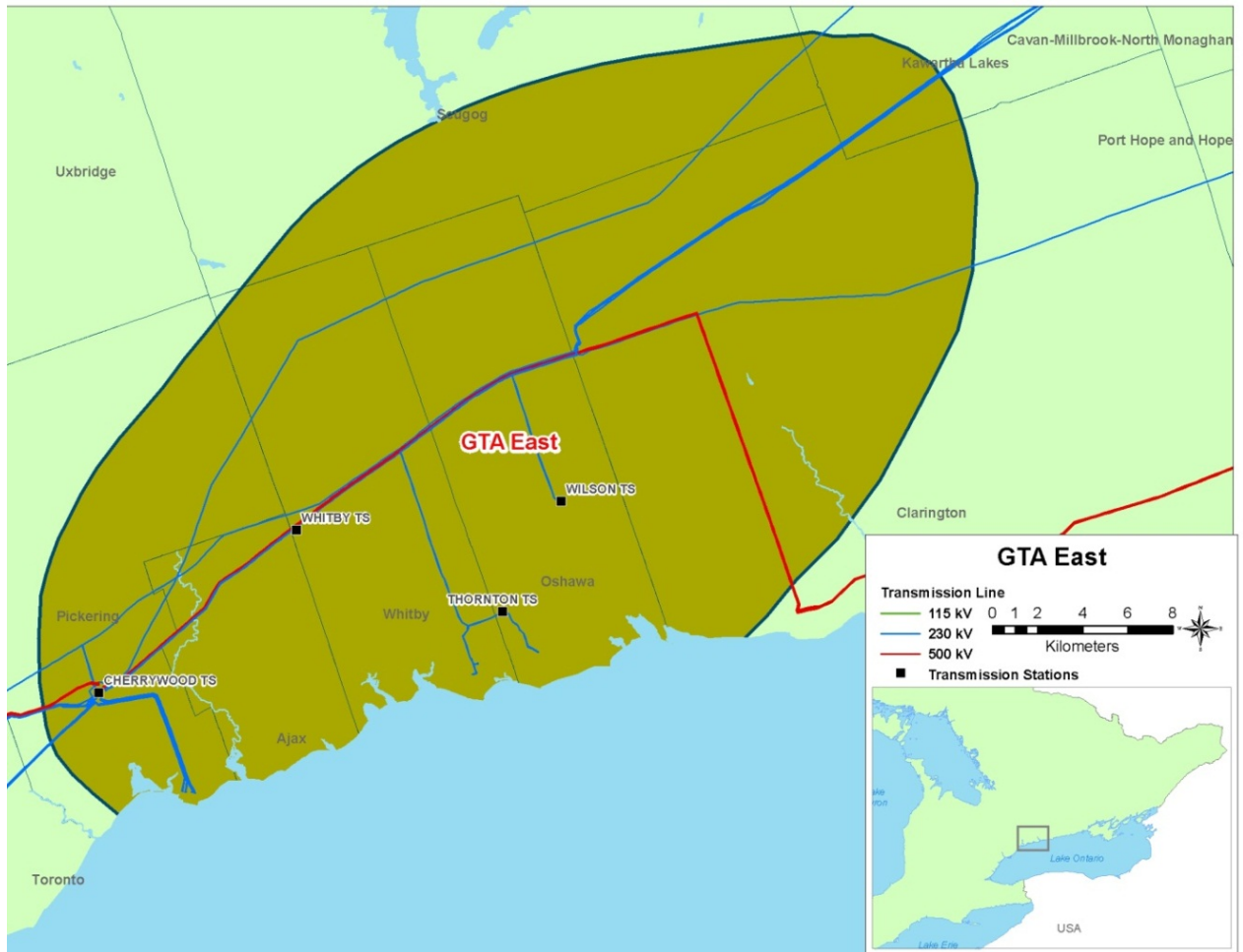
The Needs Screening for the GTA East Region was triggered in response to the Ontario Energy Board's (OEB) Regional Infrastructure Planning process approved in August 2013. To prioritize and manage the regional planning process, Ontario's 21 regions were assigned to one of three groups, where Group 1 Regions are being reviewed first. As mentioned earlier, planning activities were already underway in the GTA East Region to address some specific station capacity needs, and accordingly this Region was expedited at the request of LDCs and reprioritized from Group 2 to Group 1. The Needs Screening for this Region was triggered on June 12, 2014 and was completed on August 11, 2014.

## **3 SCOPE OF NEEDS SCREENING**

This Needs Screening covers the GTA East Region over an assessment period of 2014 to 2023. The scope of the Needs Screening includes a review of transmission system connection facility capability which covers transformer station capacity, thermal capacity, and voltage performance. System reliability, operational issues such as load restoration, and asset replacement plans were also briefly reviewed as part of this Needs Screening.

### **3.1 GTA East Region Description and Connection Configuration**

The GTA East Region comprises the municipalities of Pickering, Ajax, Whitby, Oshawa and parts of Clarington, and other parts of the Durham area. The boundaries of the GTA East Region are shown below in Figure 1.



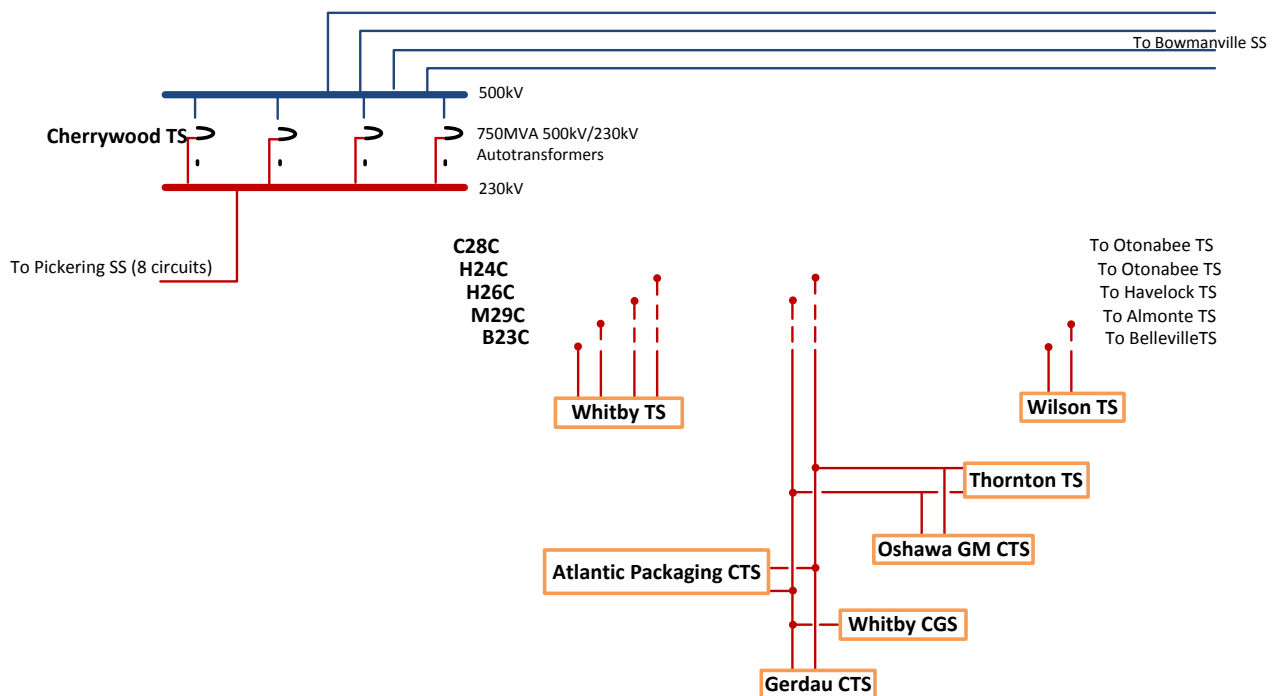
**Figure 1: GTA East Region Map**

Electrical supply to the GTA East Region is provided through 500/230kV autotransformers at Cherrywood Transformer Station (TS) and five 230 kV transmission lines connecting Cherrywood to Eastern Ontario. There are four Hydro One step-down transformer stations and three other direct transmission connected load customers. The distribution system is at two voltage levels, 44kV and 27.6kV.

The existing facilities in the Region are summarized below and depicted in the single line diagram shown in Figure 2. The 500kV system is part of the bulk power system and is not studied as part of this Needs Screening:

- Cherrywood TS is the major transmission station that connects the 500kV network to the 230kV system via four 500/230kV autotransformers.
- Four step-down transformer stations supply the GTA East load: Cherrywood TS, Whitby TS, Wilson TS, and Thornton TS.

- Three customer transformer stations (CTS) are supplied in the region: Atlantic Packaging CTS, Gerdau Ameristeel Whitby (“Gerdau”) CTS, and Oshawa General Motors (“Oshawa G.M.”) CTS.
- Four 230kV circuits (B23C, M29C, H24C, and H26C) emanating east from Cherrywood TS provide local supply to the GTA East Region. They extend from Cherrywood in the City of Pickering to Eastern Ontario. The 230kV circuit, C28C, and stations supplied by this circuit are not part of the GTA East Region.
- The Pickering Nuclear Generating Station (NGS) consists of 6 generating units with a combined output of approximately 3000 MW. It is connected to the 230kV system at Cherrywood.
- Whitby Customer Generating Station (CGS) is a 60 MW gas-fired cogeneration facility that connects to circuit H26C.



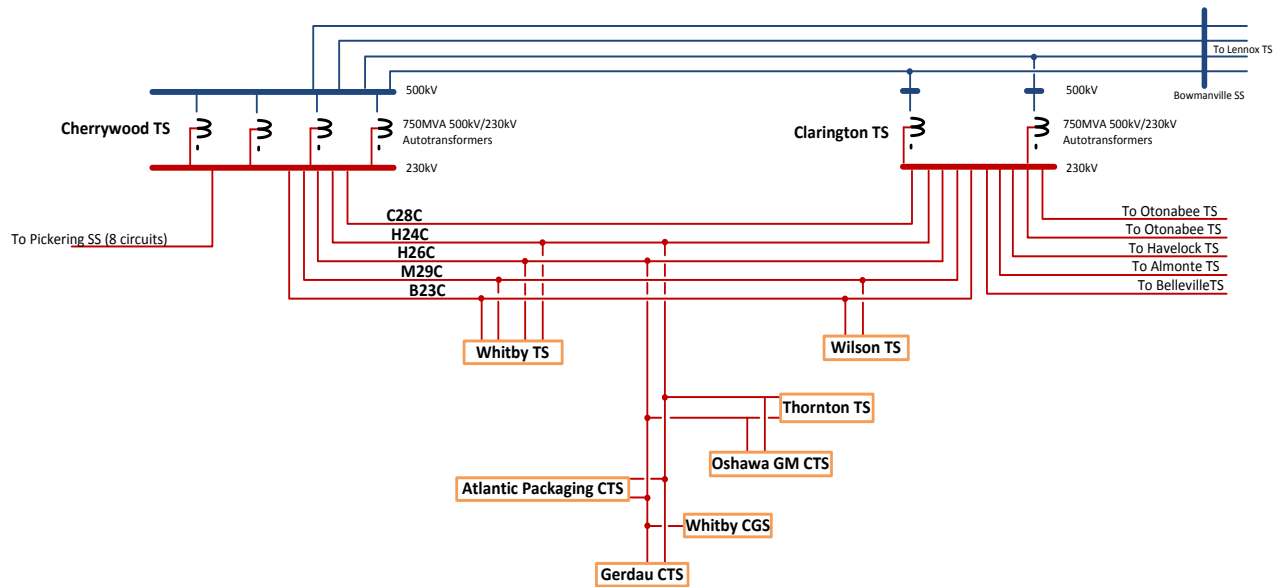
**Figure 2: Single Line Diagram – GTA East Region**

### 3.1.1 Clarington TS 500/230kV Autotransformer Station

A new 500/230kV autotransformer station in the GTA East Region within the township of Clarington (called Clarington TS) is being developed and is expected to be in-service in 2017. The new Clarington TS will provide additional load meeting capability in the Region and will eliminate the overloading of Cherrywood autotransformers that may result after the retirement of the Pickering Nuclear Generating Station (NGS).

The new autotransformer station will consist of two 750MVA, 500/230kV autotransformers and a 230kV switchyard. The autotransformers will be supplied from two 500kV circuits that pass next to the proposed site. The 230kV circuits supplying the east GTA will be terminated at Clarington TS. Clarington TS will become the principle supply source for the GTA East Region load. The modified GTA East Region with the connection to Clarington TS is shown in Figure 3.

This Needs Screening assessment is based on Clarington TS in-service and no Pickering generation units in-service.



**Figure 3: Single Line Diagram – GTA East Region with Clarington TS**

## 4 INPUTS AND DATA

In order to conduct this Needs Screening, study team participants provided the following information and data to Hydro One:

- IESO provided:
  - i. Historical 2013 regional coincident peak load and station non-coincident peak load
  - ii. List of existing reliability and operational issues
- LDCs provided historical (2011-2013) net load and gross load forecast (2014-2023)
- Hydro One (Transmission) provided transformer, station, and circuit ratings
- OPA provided Conservation and Demand Management (CDM) and Distributed Generation (DG) data

- Any relevant planning information, including planned transmission and distribution investments provided by the transmitter and LDCs, etc.

#### **4.1 Load Forecast**

As per the data provided by the study team, the load in the GTA East Region is expected to grow at an average rate of approximately 2.8% annually from 2014-2018 and 2.4% annually from 2019-2023.

## **5 ASSESSMENT METHODOLOGY**

The following methodology and assumptions are made in this Needs Screening assessment:

1. The Region is summer peaking so this assessment is based on summer peak loads.
2. Forecast loads are provided by the Region's LDCs
3. The LDC's load forecast is translated into load growth rates and is applied onto the 2013 summer peak load as a reference point.
4. The 2013 summer peak loads are adjusted for extreme weather conditions according to Hydro One's methodology.
5. The gross demand forecast is used to develop a worst case scenario to identify needs. Both the gross demand forecast and the net demand forecast (which includes forecasted CDM and DG contributions) were used to determine the timing of the needs.
6. Review impact of any on-going and/or planned development projects in the Region during the study period. This includes:
  - New 500/230kV autotransformer station in the township of Clarington called Clarington TS, which is expected to be in-service in 2017. This Needs Screening assessment is based on Clarington TS in-service and no Pickering generation units in-service.
7. Review and assess impact of any critical/major elements planned/identified to be replaced at the end of their useful life such as autotransformers, cables, and stations.

8. Station capacity adequacy is assessed by comparing the non-coincident peak load with the station's normal planning supply capacity assuming a 90% lagging power factor for stations having no low-voltage capacitor banks and 95% lagging power factor for stations having low-voltage capacitor banks. A more conservative power factor is assumed for stations having LV capacitor banks where necessary. Normal planning supply capacity for transformer stations in this Region is determined by the summer 10-Day Limited Time Rating (LTR).
9. To identify emerging needs in the Region and determine whether or not further coordinated regional planning should be undertaken, the study was performed observing all elements in service and only one element out of service.
10. Transmission adequacy assessment is primarily based on, but is not limited to, the following criteria:
  - With all elements in service, the system is to be capable of supplying forecast demand with equipment loading within continuous ratings and voltages within normal range.
  - With one element out of service, the system is to be capable of supplying forecast demand with circuit loading within their long-term emergency (LTE) ratings and transformers within their summer 10-Day LTR.
  - All voltages must be within pre and post contingency ranges as per ORTAC criteria.
  - With one element out of service, no more than 150 MW of load is lost by configuration. With two elements out of service, no more than 600 MW of load is lost by configuration.
  - With two elements out of service, the system is capable of meeting the load restoration time limits as per ORTAC criteria.

## **6 RESULTS**

This section summarizes the results of the Needs Screening in the GTA East Region. The results are based on Clarington TS in-service and no Pickering generation units in-service.

### **6.1 Transmission Capacity Needs**

#### **6.1.1 230kV Transmission Lines**

The 230kV circuits supplying the Region (B23C, M29C, H24C, and H26C) are adequate over the study period for the loss of a single 230kV circuit in the Region.

## 6.1.2 230kV Connection Facilities

A station capacity assessment was performed over the study period for the 230kV transformer stations in the Region using the station summer peak load forecast provided by the study team. The results are as follows:

### Cherrywood TS T7/T8 (230/44kV)

- From 2014 to the end of the study period, Cherrywood TS is forecast to slightly exceed its normal supply capacity based on the gross demand forecast (approximately 102% of Summer 10-Day LTR from 2014 to 2023). However, based on the planned CDM targets, the station capacity is adequate to meet the net demand over the study period, except for years 2014 and 2015. Further assessment is required for the 2014 and 2015 period when the forecasted load is approximately 101% of the Summer 10-Day LTR.

### Whitby TS T1/T2 (230/44/27.6kV)

- In 2019, Whitby TS T1/T2 27.6kV is forecast to reach its normal supply capacity based on the gross demand forecast (100% of Summer 10-Day LTR from 2019 to 2023). However, based on the net demand forecast it does not exceed its normal supply capacity during the study period.

A new community in North Pickering within Veridian Connections Inc.'s service territory is being developed and the LDC plans to supply the additional load at 27.6kV. Veridian has forecasted the gross demand to be approximately 5MW in 2018 up to 75MW in 2023 (includes load growth at Whitby TS T1/T2 27.6kV and Cherrywood TS T7/T8 for incremental load). Hence, future 27.6kV supply is required. Prior to this Needs Screening, Hydro One was working with Veridian to assess the station capacity requirements and discussed plans for a proposed new 230/27.6kV station called Seaton TS. Further assessment is required.

- Whitby T1/T2 44kV does not exceed its normal supply capacity during the study period. Therefore, no action is required at this time and the capacity need will be reviewed in the next planning cycle.

### Whitby TS T3/T4 (230/44kV)

- Based on the gross demand forecast, Whitby TS T3/T4 does not exceed its normal supply capacity during the study period. However, it is forecasted to be greater than 90% of the Summer 10-Day LTR from 2014 to the end of the study period. No action is required at this time and the capacity need will be reviewed in the next planning cycle.

### Wilson TS T1/T2 DESN1 (230/44kV)

- In 2014 and 2017 to the end of the study period, Wilson TS DESN1 is forecast to exceed its normal supply capacity based on the gross demand forecast (approximately 100.4% and 126% of Summer 10-Day LTR in 2014 and 2023 respectively). From 2015-2016, the load is forecast to fall below the Summer 10-Day LTR as a result of a planned load transfer by OPUCN from Wilson TS DESN1

to Thornton TS that may be required. Based on the net demand forecast, Wilson TS DESN1 is forecast to exceed its normal supply capacity from 2018 to the end of the study period (approximately 101% and 117% of Summer 10-Day LTR in 2018 and 2023 respectively). Transformation capacity relief is needed and further assessment is required between the transmitter and impacted LDCs.

It should also be noted that Hydro One Distribution's customer that is supplied by this DESN is currently a 10MW participant of OPA's Demand Reduction (DR) Program, where they reduce their load during peak hours under IESO's direction. For this assessment, this customer's load is assumed constant for the entire study period at a reduced level due to its participation in the DR program. However, if the customer ends its participation in the DR program earlier, then Wilson TS DESN1 may reach its normal supply capacity earlier.

#### **Wilson TS T3/T4 DESN2 (230/44kV)**

- Wilson T3/T4 DESN2 is forecasted to exceed its normal supply capacity from 2014-2023 for both the gross and net demand forecasts (approximately 124% and 115% of Summer 10-Day LTR for gross and net forecasts respectively in 2014 and 140% and 107% for gross and net forecasts respectively in 2023).

Prior to 2010, Hydro One and impacted LDCs were in discussions and developing plans for a proposed new 230/44kV station called Enfield TS that would provide transformation capacity relief to Wilson TS. These plans did not proceed further as the anticipated load did not materialize to support the construction at that time. As per the current load forecast provided by the study team, transformation capacity relief is needed and further assessment is required between the transmitter and impacted LDCs. In the past, overloading at Wilson TS DESN2 under certain conditions was significant enough that emergency rotating load shedding was required.

#### **Thornton TS (230/44kV)**

- From 2015 to the end of the study period, Thornton TS is forecast to exceed its normal supply capacity based on the gross and net demand forecast (approximately 114% and 110% of Summer 10-Day LTR for gross and net forecasts respectively in 2018 and 118% and 109% for gross and net forecasts respectively in 2023).

It should be noted that the load forecast for Thornton TS is higher than historical levels due to significant load growth at the station, particularly as a result of anticipated Metrolinx load. In addition, to help manage the affected LDC's load growth and respect 10-Day LTRs of other stations, over 60MW of load transfers to Thornton TS were included in the station's load forecast (load transfers from Wilson TS DESN1 in 2013 and 2015 and Whitby TS T3/T4 in 2013) and the associated distribution investments required by the LDC were made. Transformation capacity relief is needed and further assessment is required between the transmitter and impacted LDCs.



Currently, capacity of the Thornton T3/T4 transformers has been limited to their Continuous Rating since they have been identified as gassing. Hydro One is scheduled to replace both of these transformers in 2015 with two new 75/100/125 MVA transformers.

Available station capacity and feeder capacity utilization in the GTA East Region also needs to be reviewed in the next regional planning step in order to make efficient and cost effective use of available facility capacity.

## **6.2 System Reliability, Operation and Restoration Review**

Generally speaking, there are no significant system reliability and operating issues identified for this Region.

Based on the gross coincident demand forecast, the loss of one element will not result in load interruption. The maximum load interrupted by configuration due to the loss of two elements is below the load loss limit of 600MW by the end of the 10-year study period.

For the loss of two elements, the load interrupted by configuration may exceed 150 MW and 250 MW. Load restoration requires further assessment.

## **6.3 Aging Infrastructure and Replacement Plan of Major Equipment**

Hydro One reviewed the sustainment initiatives that are currently planned for the replacement of any auto-transformers, power transformers and high-voltage cables.

During the study period:

- Replacement of both transformers (T3 and T4) at Thornton TS is scheduled in 2015. This will eliminate the existing transformer gassing issue, but will not address capacity needs at the station.
- There are no significant lines sustainment plans scheduled in the near term for circuits in this region.

# **7 RECOMMENDATIONS**

Based on the findings of the Needs Screening assessment, the study team's recommendations are as follows:

- a) The following needs identified in Section 6 do not require further regional coordination. Rather, these potential needs can be adequately and efficiently addressed by Hydro One Networks Inc. and the relevant LDCs.
  - Wilson TS T1/T2 DESN1 (230/44kV) – station capacity need
  - Wilson TS T3/T4 DESN2 (230/44kV) – station capacity need
  - Thornton TS T3/T4 (230/44kV) – station capacity need

- b) Coordinated regional planning is further required to assess the following needs identified in Section 6. The OPA will undertake a Scoping Assessment to determine the appropriate process to address these needs:
- Cherrywood TS T7/T8 (230/44kV) – station capacity need
  - Whitby TS T1/T2 27.6kV supply (230/44/27.6kV) – station capacity need
  - Load restoration for the loss of two elements

As part of the Scoping Assessment process, it will be determined whether the OPA-led IRRP process and/or the transmitter-led RIP process (for wires solutions) should be further undertaken.

Available station capacity and feeder capacity utilization in the GTA East Region is also recommended for review as part of further assessing the needs identified in 7a) and 7b) in order to make efficient and cost effective use of available facility capacity.

- c) The following potential needs in Section 6 will be monitored and assessed in the next Regional Planning cycle for the GTA East Region:
- Normal supply capacity at Whitby TS T1/T2 44kV windings and Whitby TS T3/T4
  - Monitor and assess load growth on 230kV transmission circuits B23C/M29C and H24C/H26C for loss of two elements (600MW limit).

## 8 NEXT STEPS

Following the Needs Screening process the next regional planning steps, based on the results of this report, are:

- Hydro One Transmission and impacted LDCs to develop and implement local solutions for the needs identified in Section 7a) ; and
- OPA to initiate a Scoping Assessment to determine which of the needs in Section 7b) require an IRRP and/or RIP

## 9 REFERENCES

- i) [Planning Process Working Group \(PPWG\) Report to the Board: The Process for Regional Infrastructure Planning in Ontario – May 17, 2013](#)
- ii) [IESO 18-Month Outlook: March 2014 – August 2015](#)
- iii) [IESO Ontario Resource and Transmission Assessment Criteria \(ORTAC\) – Issue 5.0](#)
- iv) [IESO System Impact Assessment Report for Clarington TS \(CAA ID#: 2012-462\)](#)

## 10 ACRONYMS

|       |   |
|-------|---|
| BES   | Bulk Electric System                                  |
| BPS   | Bulk Power System                                     |
| CDM   | Conservation and Demand Management                    |
| CIA   | Customer Impact Assessment                            |
| CGS   | Customer Generating Station                           |
| CTS   | Customer Transformer Station                          |
| DESN  | Dual Element Spot Network                             |
| DG    | Distributed Generation                                |
| DSC   | Distribution System Code                              |
| GS    | Generating Station                                    |
| GTA   | Greater Toronto Area                                  |
| IESO  | Independent Electricity System Operator               |
| IRRP  | Integrated Regional Resource Planning                 |
| kV    | Kilovolt  |
| LDC   | Local Distribution Company                            |
| LTE   | Long Term Emergency                                   |
| LTR   | Limited Time Rating                                   |
| LV    | Low-voltage   |
| MW    | Megawatt  |
| MVA   | Mega Volt-Ampere                                      |
| NERC  | North American Electric Reliability Corporation       |
| NGS   | Nuclear Generating Station                            |
| NPCC  | Northeast Power Coordinating Council Inc.             |
| NS    | Needs Screening                                       |
| OEB   | Ontario Energy Board                                  |
| OPA   | Ontario Power Authority                               |
| ORTAC | Ontario Resource and Transmission Assessment Criteria |
| PF    | Power Factor  |
| PPWG  | Planning Process Working Group                        |
| RIP   | Regional Infrastructure Planning                      |
| SIA   | System Impact Assessment                              |
| SS    | Switching Station                                     |
| TS    | Transformer Station                                   |
| TSC   | Transmission System Code                              |
| ULTC  | Under Load Tap Changer                                |