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BY COURIER

November 1, 2017

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
Suite 2700, 2300 Yonge Street
Toronto, ON
M4P 1E4

Dear Ms. Walli,

EB-2011-0043 – 2017 Regional Planning Status Report of Hydro One Networks Inc.

Section 3C.3.3 of the Transmission System Code requires transmitters to submit an annual report to the Ontario Energy Board, on November 1st of each year, that identifies the status of regional planning for all regions.

Please find attached Hydro One Networks Inc.'s 2017 Regional Planning Process Annual Status Report, pursuant to the above noted Code section.

Sincerely,

ORIGINAL SIGNED BY FRANK D'ANDREA

Frank D'Andrea

Attach.



Regional Planning Process

Annual Status Report

2017

November 1st, 2017

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EXECUTIVE SUMMARY

As part of the Transmission System Code^[1] (TSC) amendments on August 26, 2013, a new provision was introduced in Section 3C.3.3 of the TSC requiring transmitters to submit an annual report to the Ontario Energy Board (OEB or Board) on November 1st of each year, which identifies the status of the regional planning for their respective regions. This Report is the fourth Annual Status Report produced by Hydro One Networks Inc. (Hydro One) and provides an update to the accomplishments and progress of regional planning activities between November 2016 and October 2017.

Progress to Date

The first cycle of the regional planning process is complete following the process developed by the Planning Process Working Group (PPWG). The second regional planning cycle has been initiated and the Needs Assessment (NA) for three regions of Group 1 is now complete.

One of the most important accomplishments during the past year has been the successful and timely completion of the first cycle of the regional planning process. In the first cycle of the regional planning process sixteen (16) NA, six (6) Scoping Assessments (SA), sixteen (16) Integrated Regional Resource Plans (IRRP), seventeen (17) Local Plans (LP), and nineteen (19) Regional Infrastructure Plans (RIP) reports were completed and published on Hydro One's regional planning website. Over the last year, three (3) NA, one (1) SA, five (5) LP, and four (4) IRRP reports were completed and Hydro One led the Study Team in nine (9) regions to complete the RIP as follows: three in Group 1 regions (Burlington to Nanticoke, GTA East, Northwest Ontario), two in Group 2 regions (London Area, South Georgian Bay/Muskoka) and four in Group 3 regions (Chatham/Lambton/Sarnia, Greater Bruce/Huron, Niagara and North/East of Sudbury). In addition, as a Lead Transmitter Hydro One has also sent formal communication to the LDCs to seek feedback on prioritization of regions, schedule, and suggestions for enhancements in the second cycle.

Another accomplishment is the initiation of the second cycle of regional planning process, where a NA has been completed for three regions in Group 1 (Burlington to Nanticoke, Toronto Area and Windsor-Essex).

In addition, since the initiation of the first Regional Planning cycle in 2013, several lessons were learned to undertake improvements to the process, methodology, and in the documentation. These enhancements have been incorporated in the second regional planning cycle.

The status of regional planning for each region is illustrated in Table 1.

Table 1. Regional Planning Status Summary

Group	Region	Sub-region	1st Cycle (2013-2017)				2nd Cycle (2017->)		
			NA	SA	IRRP	RIP	NA	SA	
1	Burlington to Nanticoke	Brant	May, 2014	Sep, 2014	Apr, 2015	Feb, 2017	May, 2017	<i>In Progress</i>	
		Bronte			Jun, 2016				
		Greater Hamilton			<i>Not Required</i>				
		Caledonia-Norfolk			<i>Not Required</i>				
	Greater Ottawa	Ottawa	Jul, 2014	Nov, 2014	Apr, 2015	Dec, 2015	Q1 2018		
		Outer Ottawa	<i>Not Required</i>	<i>Not Required</i>					
	GTA East	Pickering-Ajax-Whitby	Aug, 2014	Sep, 2014	Jun, 2016	Jan, 2017	Q1 2019		
		Oshawa-Clarington			<i>Not Required</i>				
	GTA North	York	Jun, 2014	<i>Note1</i>	Apr, 2015	Feb, 2016	Q4 2017		
		Western			<i>Not Required</i>				<i>Not Required</i>
	GTA West	Northwestern	May, 2014	Sep, 2014	Apr, 2015	Jan, 2016	Q1 2018		
		Southern			<i>Not Required</i>				
	Kitchener-Waterloo-Cambridge-Guelph			<i>Note1</i>		Apr, 2015	Dec, 2015	Q2 2018	
	Toronto Area	Central Downtown	Jun, 2014	<i>Note1</i>	Apr, 2015	Jan, 2016	<i>In Progress</i>		
Northern		<i>Not Required</i>			<i>Not Required</i>				
Northwest Ontario	North of Dryden	<i>Note1</i>	Jan, 2015	Jan, 2015	Jun, 2017	Q4 2018			
	Greenstone-Marathon			Jun, 2016					
	Thunder Bay			Dec, 2016					
	West of Thunder Bay			Jul, 2016					
Windsor-Essex			<i>Note1</i>		Apr, 2015	Dec, 2015	<i>In Progress</i>		
2	<i>Hydro One Transmission is not the lead transmitter in this region. Status to be provided by lead transmitter.</i>								
	London Area	Greater London	Apr, 2015	Aug, 2015	Jan, 2017	Aug, 2017		Group 2 will not commence 2nd cycle until 2019.	
		Alymer-Tillsonburg			<i>Not Required</i>				
		Strathroy			<i>Not Required</i>				
		Woodstock			<i>Not Required</i>				
		St. Thomas			<i>Not Required</i>				
	Peterborough to Kingston			Feb, 2015	<i>Not Required</i>	<i>Not Required</i>	Jul, 2016		
South Georgian Bay/Muskoka	Barrie/Innisfil	Mar, 2015	Jun, 2015	Dec, 2015	Aug, 2017				
	Parry Sound/Muskoka			Dec, 2015					
Sudbury/Algoma			Mar, 2015	<i>Not Required</i>	<i>Not Required</i>	Jun, 2016			
3	<i>Hydro One Transmission is not the lead transmitter in this region. Status to be provided by lead transmitter.</i>								
	North of Moosonee								
	Chatham/Lambton/Sarnia			Jun, 2016	<i>Not Required</i>	<i>Not Required</i>	Aug, 2017	Group 3 will not commence 2nd cycle until 2020.	
	Greater Bruce/Huron			May, 2016	<i>Not Required</i>	<i>Not Required</i>	Aug, 2017		
	Niagara			Apr, 2016	<i>Not Required</i>	<i>Not Required</i>	Mar, 2017		
	North/East of Sudbury			Apr, 2016	<i>Not Required</i>	<i>Not Required</i>	Apr, 2017		
	Renfrew			Mar, 2016	<i>Not Required</i>	<i>Not Required</i>	Jul, 2016		
St. Lawrence			Apr, 2016	<i>Not Required</i>	<i>Not Required</i>	Jul, 2016			

Note 1: The planning activity in the region was already in progress prior to the commencement of the regional planning process; hence the NA/SA was deemed to be already completed by the Working Group.

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1. INTRODUCTION

The process for electric power system planning in the Province of Ontario underwent a significant procedural change in 2013. A new regional planning process, which enables transparent, coordinated and cost-effective planning of regional transmission and distribution systems, was mandated by the Ontario Energy Board (OEB) on August 26, 2013 through amendments to both the Transmission System Code^[1] (TSC) and the Distribution System Code^[3] (DSC). This process is outlined in the Planning Process Working Group's (PPWG) Report to the Board, titled "The Process for Regional Infrastructure Planning in Ontario"^[4], revised May 17, 2013.

As part of the TSC amendments, a new provision was introduced in Section 3C.3.3 of the TSC requiring transmitters to submit an annual report to the Board on November 1st of each year, which identifies the status of the regional planning process and its products in their respective regions. This fourth Annual Status Report produced by Hydro One Networks Inc. (Hydro One) provides an update to the accomplishments and progress of the regional planning activities from November 2016 to October 2017. It also identifies the plans and projects already in execution to address some of the needs.

The balance of the Report is structured as follows:

- Section 2 provides an overview of the regional planning process and the grouping of the regions for study purposes.
- Sections 3, 4, and 5 discuss the various regional planning activities and plans or projects completed or being undertaken in each of the Group 1, 2, and 3 regions respectively.
- Section 6 and 7 identify lessons learned and improvements made to the regional planning process, and LDC survey results regarding the regional planning process implementation.
- Section 8 provides a brief summary of the current status of regional planning and its accomplishments over the last year.

2. REGIONAL PLANNING PROCESS OVERVIEW

Bulk system planning, regional planning and distribution planning are the three levels of planning for the electricity system in Ontario. Bulk system planning typically looks at issues that impact the system on a provincial level, and require longer lead times and larger investments. Comparably, planning at the regional and distribution level looks at issues on a more regional or localized level. Typically, the regional planning horizon is in the near- to medium-term (5-10 years), and may not require the same magnitude of investments as bulk system planning.

The regional planning process begins with a Needs Assessment (NA) which is led by the transmitter to determine if there are regional needs that require coordinated regional planning activities and, if so, what is the general scope and which Local Distribution Companies (LDC) should be involved in the planning activities.

At the end of the NA, a decision is made by the Study Team as to whether further regional coordination is necessary to address some or all of the regional needs. If no further regional coordination is required and needs are local in nature, any necessary investments are to be planned directly by the LDCs (or customers) and the transmitter through a Local Plan (LP). The Region's Study Team recommends a LP process when needs a) are local in nature b) require limited investments in wires (transmission or distribution) solutions and c) do not require upstream transmission investments.

In situations where identified regional needs require coordination at the regional or sub-regional levels, the Independent Electricity System Operator (IESO) then initiates the Scoping Assessment (SA) phase. During this phase, the IESO, in collaboration with the transmitter and impacted LDCs, reviews the information collected as part of the NA phase, along with additional information on potential non-wires or resource (e.g., Conservation and Demand Management, distributed generation, etc.) alternatives and makes a decision on the most appropriate regional planning approach i.e., LP, IRRP and/or RIP.

The primary purpose in the IRRP is to identify and assess both resource and wires options at a higher or more macro level, but sufficient to permit a comparison to address the needs. The LDCs' Conservation and Demand Management (CDM) targets as well as contracted Distributed Generation (DG) plans are provided by IESO and LDCs are reviewed and considered at each step in the regional planning process.

If and when an IRRP identifies that resource and/or wires options may be most appropriate to meet a need, resource/wires planning can be initiated in parallel with the IRRP or in the RIP phase to undertake a more detailed assessment, develop specific resource/wires alternatives, and to recommend a preferred wires solution.

As a final step of the regional planning process, Hydro One as the lead transmitter undertakes to develop a RIP for the region and publishes a RIP report. The RIP reports may be referenced as supporting evidence in a cost of service or Leave-to-Construct approval application.

Figure 1 illustrates the various steps of the regional planning process that include NA (also referred to as Needs Screening), SA (also called Scoping Process), LP, IRRP, and RIP.

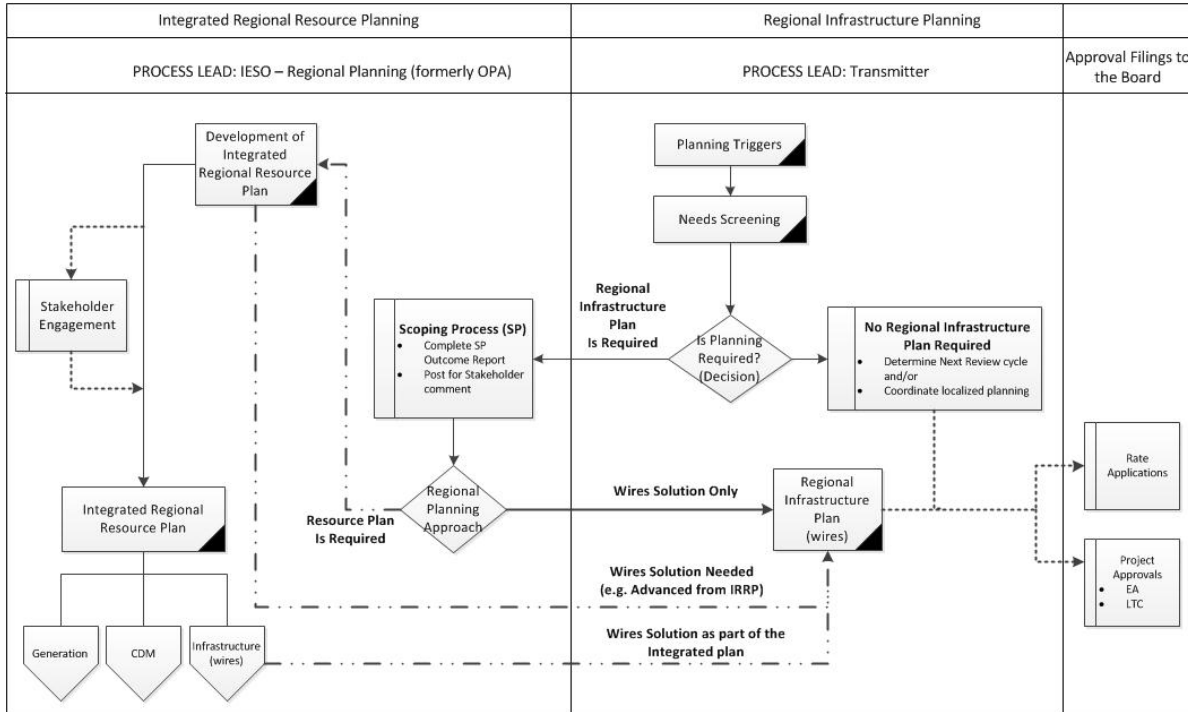


Figure 1. Regional Planning Process Flowchart

2.1 Regional Grouping

In order to manage and prioritize regional planning activities, the province was divided into 21 regions which were then assigned to three groups. Hydro One is the lead transmitter in all regions, except the East Lake Superior and North of Moosonee Regions. For each regional planning activity at the regional or sub-regional level, a Study Team is established for each region with representatives from the IESO, Hydro One, and LDCs in the area. During the regional planning process, this Study Team may subdivide a region into one or more sub-regions based on electrical characteristics, contiguity and the need for efficient and effective assessment. In some cases, no further regional coordination may be required for a sub-region.

Regions were prioritized into three groups based on the urgency and anticipated near-term and mid-term needs in each region or where regional planning activities were already underway prior to the TSC and DSC amendments. For regions where regional planning activity was already in progress, NA and/or SA phases were deemed to be complete and no reports were developed. The Working Group (PPWG) determined that these regions were already in the SA or IRRP phase of the process.

The planning regions are listed in Table 2 and shown geographically in Figure 2.

Table 2. Regional Grouping

Group 1	Group 2	Group 3
Burlington to Nanticoke	East Lake Superior	Chatham/Lambton/Sarnia
Greater Ottawa	London Area	Greater Bruce/Huron
GTA East	Peterborough to Kingston	Niagara
GTA North	South Georgian Bay/Muskoka	North of Moosonee
GTA West	Sudbury/Algoma	North/East of Sudbury
KWCG		Renfrew
Toronto		St. Lawrence
Northwest Ontario		
Windsor-Essex		

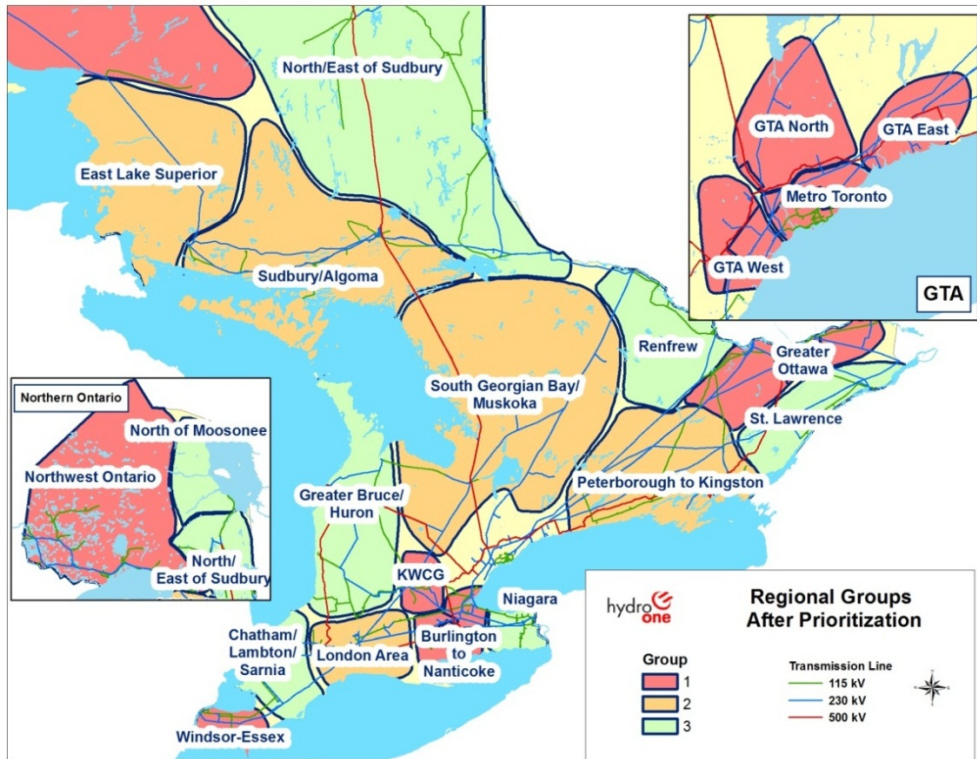


Figure 2. Regional Planning Regions

2.2 Conservation & Demand Management and Distributed Generation

CDM is taken into account in the planning assessments at each step of the regional planning process. It is based on requirements of individual LDCs to comply with conservation targets that are to be achieved through the provision of CDM programs to each customer segment in their service territories [5]. The CDM information is provided by the IESO and prepared jointly by the LDC and the IESO for regional planning assessments.

Consistent with Section 21.2.2 (g) of the IESO License and Section 3C.3 of the TSC, the IESO provides peak demand offsets resulting from LDC CDM programs and total installed and effective capacity of IESO contracted DG projects which have come into service or are under development for regions or sub-regions in which an IRRP has been completed. The CDM and DG summary provided by the IESO is attached in Appendix A.

It is worth noting that peak demand offsets resulting from LDC CDM programs provided by the IESO are total offsets to be achieved by the LDC within its service territory and hence may not be limited to or reflective of offsets within the specific region. In addition, contracted DG plans have also been taken into account during the planning assessment. Both, CDM and DG information is used to develop a net forecast from the gross load forecast provided by the LDCs.

3. STATUS OF GROUP 1 REGIONS

RIPs have been completed for all Group 1 regions for the first cycle of the Regional Planning Process.

The RIPs for Burlington to Nanticoke, GTA East and Northwest Ontario regions were completed this year and the second cycle NAs for Burlington to Nanticoke, Toronto and Windsor-Essex have been finished.

3.1 Burlington to Nanticoke

Burlington to Nanticoke Region comprises the municipalities of Burlington, Hamilton, Oakville, Brantford, and the Counties of Brant, Haldimand, and Norfolk. For the purposes of regional planning, the region is divided into four sub-regions: Brant, Bronte, Greater Hamilton, and Caledonia-Norfolk sub-regions.

The first cycle RIP and the NA for the second cycle have been completed. Currently, IRRP is in progress for the Hamilton sub-region. Updates to the regional plans for each sub-region are discussed below.

3.1.1 Brant Sub-region

Brant sub-region encompasses the County of Brant, City of Brantford and surrounding areas. The electricity supply to this area is provided by Brant TS, Powerline MTS, and Brantford TS.

The Brant IRRP and the RIP for the region identified that there is an immediate need for additional transmission supply capacity in the Brant-Powerline 115 kV subsystem. The preferred option required the installation of three 115 kV in-line breakers to connect existing circuits B12/B13 from Burlington to circuit B8W from Woodstock TS. The project is progressing as anticipated and is currently planned to be completed in Q3 2019.

3.1.2 Bronte Sub-region

The Bronte sub-region includes the area served by Bronte TS in Oakville, supplied by 115 kV circuits B7/B8 connecting it to Burlington TS and Cumberland TS. The study area also extends to include the adjacent transformer stations, namely Palermo TS, Tremaine TS, Glenorchy MTS, and Oakville TS #2.

No new needs were identified in the sub-region during the RIP and second cycle NA.

3.1.3 Greater Hamilton Sub-region

The Greater Hamilton Sub-region encompasses the City of Hamilton and surrounding areas. Several local needs were identified in this sub-region and were addressed directly by Hydro One and affected LDCs through a LP, completed in October 2015. The following is an update on needs that were addressed through local planning:

- **Mohawk TS Station Capacity and End-of-Life (EOL) T1/T2 Transformers**
The sustainment plan to replace the existing non-standard supply transformers at Mohawk TS with standard 75 MVA units will address the issue of aging infrastructure and provide sufficient station supply capacity. The current in service date for the replacement work is Q2 2019.
- **Power Factor at Cumberland TS**
The power factor at Cumberland TS under peak load conditions is lagging slightly below the requirement of 0.9. The LDC is addressing this need as part of their distribution system planning and the assessment is in progress.
- **Power Factor at Kenilworth TS**
The power factor at Kenilworth TS is lagging below the requirement of 0.9. The LDC is addressing this need as part of their distribution system planning and the assessment is in progress.

EOL station equipment was also identified for replacement in the Greater Hamilton sub-region in the RIP and second cycle NA. The Study Team provided the following recommendations to address the EOL equipment needs:

- **Kenilworth TS Station Reconfiguration**
The recommended plan is for Hydro One to proceed with the reconfiguration of the station and reduce it to two transformers and two switchgears only. The recently replaced EOL transformer and one of the existing metal-clad switchgear will be utilized while the other EOL transformer and switchgear will be replaced. The new transformer will be a standard unit similar to T2 that was replaced in 2014. The current in service date for the replacement work is 2018.
- **Beach TS T3/T4 Transformers**
The recommended plan is for Hydro One to proceed with reconfiguring the 115 kV T3/T4 DESN to a 230 kV configuration by replacing the existing EOL non-standard transformers with standard 100 MVA 230/13.8 kV units. The project is currently in execution and is planned to be in service in 2019.
- **Gage TS T3/T4/T5/T6 Transformers and LV Switchgear**
The recommended plan is to reconfigure the station and reduce it from 3 DESNs to 2 DESNs. Under this plan, the EOL T3/T4 and T5/T6 DESNs will be replaced by a single T10/T11 DESN with two 100 MVA standard units, and switchgear currently supplied by T5/T6 transformers will also be replaced. This option will provide future flexibility to eliminate

T8/T9 DESN when it approaches the end of its life. The project is currently planned to be in service in 2019.

- **Horning TS DESN Transformers**

The recommended plan is to replace EOL T1/T2 transformers with similar 100 MVA units and refurbishing EOL low voltage metalclad switchgears. The newly replaced transformers and refurbished switchgear will provide sufficient capacity to serve the forecasted load over the next 10 years. The project is currently in execution and is planned to be in service in 2018.

- **Bronte TS T5/T6 Transformers**

The recommended plan is to replace the EOL T5/T6 83 MVA transformers with similar units and refurbish the associated switchgear. This project is expected to be in-service by 2019.

- **Elgin TS T1/T2 and T3/T4 Transformers and LV Switchgear**

The recommended plan is to reconfigure the station and reduce it to two transformers and two switchgears only. Under this plan, the EOL T1/T2 and T3/T4 DESNs will be replaced by a single T5/T6 DESN with two 100 MVA standard units and four new switchgears. This will maintain adequate supply capacity for the load through the four new switchgears. The project is planned to be in service in 2019.

- **Birmingham TS LV Switchgear**

The recommended plan is to replace the two EOL 13.8 kV LV metal-clad switchgears at Birmingham TS to meet the unique connection needs of the customer at this station. Not replacing the EOL switchgears will increase the risk of failure due to asset condition and adversely impact supply to a large industrial customer. This project is planned to be in-service in 2021.

- **Newton TS Transformers and Switchgear**

The recommended Plan is to further assess the need in the next phase of the regional planning cycle. The preliminary plan is to refurbish Newton TS with new equipment built to current standards including two 75 MVA transformer units replacing the EOL 67 MVA transformers and LV switchgear. This will address the needs at Newton TS by maintaining the station's operability and reliability of supply. This project is currently planned to be in service in 2021.

- **Dundas TS LV Switchgear**

The recommended plan is to refurbish the Dundas TS T1/T2 27.6 kV Medium Voltage (MV) switchgear which is at its EOL. Currently this project is expected to be in service in 2021.

- **Lake TS LV Switchgear**

The recommended plan is to further assess this need in the next phase of the regional planning cycle. Hydro One has identified that the LV switchyards are expected to reach its EOL by 2022 and will require replacement.

- **Beach TS T7/T8 Autotransformers and T5/T6 LV Switchgear**

Beach TS is a major switching and transformer station in East Hamilton. Station facilities include a 230 kV switchyard, three 230/115 kV autotransformers (T1/T7/T8), a 115 kV switchyard, a 230/13.8 kV DESN T5/T6 and a 115/13.8 kV DESN T3/T4. Hydro One has

identified that the autotransformers T7, T8 and the T5/T6 DESN LV Metal-clad switchgear are approaching their EOL and will require replacement around 2025.

The recommended plan is to further assess this need in the next phase of the second regional planning cycle currently underway.

- **End of Life Cables in Hamilton Area: HL3/HL4, K1G/K2G, H5K/H6K**

Underground cables in Hamilton area (listed below) are expected to be approaching their EOL over the next 10 years.

- 115 kV H5K/H6K Cable (Beach TS to Kenilworth TS)
- 115 kV K1G/K2G Cable (Kenilworth TS to Gage TS)
- 115 kV HL3/HL4 Cable (Newton TS to Elgin TS)
- 115 kV HL3/HL4 Cable (Elgin TS to Stirton TS)

Given that the replacement of high voltage underground cables will be very challenging and costly, it is required that alternatives be developed and assessed ahead of time. The recommended plan is to further assess the cable replacement needs and develop a tentative plan in the next phase of the second regional planning cycle.

3.1.4 Caledonia-Norfolk Sub-region

This sub-region includes the Haldimand and Norfolk Counties, and covers the southern part of Burlington to Nanticoke Region. The previously identified low voltage need at Norfolk TS and Bloomsburg MTS under peak load single contingency condition no longer exists due to reduction in load from the new forecast in the sub-region. End of Life component replacement needs at Caledonia TS, Jarvis TS, Middleport TS and Nanticoke TS are identified and Hydro One will coordinate with relevant LDCs and IESO, as required.

The NA for the second cycle is complete and it concluded that no further regional coordination is required to replace EOL LV switchgears at Birmingham TS, Dundas TS, Brantford TS, Norfolk TS, and Burlington TS and EOL transformers at Caledonia TS and Jarvis TS with similar equipment. The replacement and/or refurbishment of these assets will be further planned and coordinated by Hydro One with the relevant LDCs.

3.2 Greater Ottawa

Greater Ottawa Region covers the municipalities bordering the Ottawa River from Stewartville in the West to Hawkesbury in the East and North of Highway 43. For the purpose of regional planning, the region is divided into two sub-regions: Ottawa Area and Outer Ottawa sub-regions.

The RIP for the Greater Ottawa Region was completed in December 2015 and recommended regional plans are being monitored by Hydro One for timely completion. An update is provided below:

3.2.1 Ottawa Area Sub-region

The Ottawa Area sub-region covers the central part of the Greater Ottawa Region and includes the City of Ottawa and the surrounding municipalities.

- The need for additional 230/115kV auto-transformation capacity at Merivale TS and provision for a supply for a new station in the southwest Ottawa area are still being studied by the Study Team.
- Reinforcement of circuits M30A/M31A is currently planned to be completed in 2022.
- Refurbishment of Hawthorne-to-Moulton section on circuit A4K is currently planned to be completed by 2024.
- **Russell TS and Riverdale TS**
The loading on these stations will be kept within equipment limits through the construction of feeder ties by Hydro Ottawa to transfer excess loads to other area stations. Hydro Ottawa is assessing this as part of its distribution system planning.
- **Overbrook TS**
Step-down transformers at Overbrook TS were identified to be approaching EOL. To address the EOL and additional future capacity needs in the region, the station transformers are being replaced with larger sized units that will increase the station capacity from 72MW to 130MW. The replacement work is in progress and currently planned to be in service in Q4 2017.
- **Hawthorne TS**
To address the EOL need of T7 and T8 transformers, Hydro One is installing larger, 75/125 MVA transformers with an LTR of 153MW. The replacement work is currently in progress and planned to be in service by Q3 2018.
- **King Edward TS**
The capacity at King Edward TS is limited to 71MW. By replacing the limiting transformer T4 and additional low voltage components such as circuit breakers and a cable, a higher capacity of up to 130MW can be achieved at King Edward TS. This work is pending a final decision and request to proceed from Hydro Ottawa.

The following Greater Ottawa projects addressing regional needs have already advanced to the execution phase.

- **Hawthorne TS Capacity:** Addressed by replacing two of the older autotransformers with larger capacity units (Q2 2018).
- **A4K Capacity:** Addressed by providing an additional supply to Overbrook TS from a tap to circuit A6R (Q2 2019).

3.2.2 Outer Ottawa Sub-region

The Outer Ottawa sub-region includes the eastern and western parts of the Greater Ottawa Region. The eastern part extends from the city of Clarence-Rockland, municipality of Casselman and

eastward to Champlain Township. Along the Ottawa River there are several LDC-owned distribution stations supplied by the 115 kV circuit 79M1. The western part covers the area west of Kanata.

As mentioned in last year's annual status report to OEB, the mid-term need for voltage regulation on 115kV circuit 79M1 will be reassessed in the next regional planning cycle.

The next cycle of Regional Planning for the Greater Ottawa Region currently anticipated commencing in 2018.

3.3 GTA East

GTA East Region comprises the municipalities of Pickering, Ajax, Whitby, Oshawa and parts of Clarington and other parts of Durham Region. The region is divided into two sub-regions for the purpose of regional planning: Pickering-Ajax-Whitby and Oshawa-Clarington sub-regions.

The RIP for GTA East Region was completed in January 2017 and recommended regional plans are being monitored by Hydro One for timely completion. An update is provided below:

3.3.1 Pickering-Ajax-Whitby Sub-region

This sub-region includes the area served by Cherrywood TS, Whitby TS, and the 230kV transmission system covering most of the City of Pickering, Town of Ajax, part of the Town of Whitby, and part of the Townships of Uxbridge and Scugog. Over the next 10 years, the load in this Sub-Region is forecasted to increase at approximately 2.1% annually. Based on the DG and CDM forecasts in the Sub-Region, adequate 44kV transformation capacity is available at Cherrywood TS T7/T8 and Whitby TS to maintain reliable supply to meet the demand over the study period.

With the proceeding of a new residential and mixed use commercial area in the Sub-Region, called Seaton, significant increase in load demand is expected resulting in a shortage of 27.6kV transformation capacity by 2019. Therefore Seaton MTS; a new 230/27.6/27.6kV station, is planned for an in-service date of 2019.

3.3.2 Oshawa-Clarington Sub-region

This sub-region includes the area served by Thornton TS, Wilson TS, and the 230kV transmission system encompassing the City of Oshawa, part of the Municipality of Clarington and part of the Township of Scugog.

To address the station capacity need at Wilson TS and Thornton TS, the Study Team recommended building a new transformer station, Enfield TS, at the Clarington TS site. The project is currently planned to be in-service in 2019.

The next cycle of Regional Planning for the GTA East Region is currently anticipated commencing in 2019.

3.4 GTA North

The GTA North Region is approximately bounded by the Regional Municipality of York, and also includes parts of the Cities of Toronto, Brampton, and Mississauga. For the purpose of regional planning, the region was divided into two sub-regions: York and Western sub-regions.

The RIP for this region was completed in February 2016 and recommended regional plans are being monitored by Hydro One for timely completion. A brief update is provided below:

3.4.1 York Sub-region

This sub-region is further classified into Southern York and Northern York areas to reflect the layout of the electricity infrastructure. Southern York area includes the municipalities of Vaughan, Markham, and Richmond Hill; while the Northern York area encompasses the municipalities of Aurora, Newmarket, King, East Gwillimbury, Whitchurch-Stouffville and Georgina, as well as some load in Simcoe County that is supplied from the same electricity infrastructure.

- To provide additional transformation supply capability and meet near-term demand growth in Vaughan, a new transformer station as discussed in the previous report, Vaughan MTS #4 is under development by Alectra Utilities. The station will connect to the 230 kV transmission lines B82V/B83V. The project is currently planned to be in service in Q4 2017.
- The switching facilities being built at Holland TS to meet load security and restoration needs in the Northern York area is currently progressing as planned and expected to be in service in Q4 2017.
- Load security and restoration needs were identified in the Southern York area for the loss of double 230 kV transmission circuits V71P/V75P which supply loads in Vaughan and Richmond Hill. Sectionalizing the double-circuit lines by installing new switching facilities was recommended as the preferred alternative to address the restoration needs. This project is progressing as planned and expected to be in service in Q2 2018.

3.4.2 Western Sub-region

This sub-region comprises the Western portion of the City of Vaughan, roughly bordered geographically by Highway 407 on the south, King-Vaughan Road on the north, Highway 50 on the west, and Islington Avenue on the east.

A potential load restoration issue for the loss of 230kV circuits V43 and V44 was identified for the sub region. No other capacity needs were identified over the near and medium-term. This restoration need will be assessed by IESO as part of a Bulk System Planning study. Although Bulk

system planning is outside the scope of regional planning, the Study Team will be provided an update on the outcome of the assessment to ensure coordination.

The next cycle of Regional Planning for the GTA North Region is currently anticipated to commence in Q4 2017.

3.5 GTA West

The GTA West Region covers the Regional Municipalities of Halton and Peel, and comprises parts of the municipalities of Brampton, South Caledon, Halton Hills, Mississauga, Milton, and Oakville. For the purpose of regional planning, the region was divided into two sub-regions: Northwestern and Southern sub-regions.

The RIP for this region was completed in January 2016 and recommended regional plans are being monitored by Hydro One for timely completion. An update is provided below:

3.5.1 Northwestern Sub-region

This sub-region includes the municipalities of Milton, Halton Hills, and Southern Caledon and parts of the City of Brampton.

The GTA West RIP identified the following:

- For the near-term, additional station capacity is needed at Halton TS that supplies Halton Hills Hydro and Milton Hydro. The recommendations were to build two new step-down stations: one to provide supply for Halton Hills Hydro (Halton Hills Hydro MTS), and a second to supply Milton Hydro (Halton TS #2), which according to the most recent load forecast will be required in 2020 and 2021 respectively.
- The thermal capacity limitations in the medium-term of circuits T38B/T39B under a single-circuit contingency with Halton Hills GS out of service will be further assessed as part of the IESO-led Bulk System Planning study. Although Bulk system planning is outside the scope of regional planning, the Study Team will be provided an update on the outcome of the assessment to ensure coordination.
- The electricity corridor needs in the Northwestern sub-region are currently being put on hold due to uncertainties associated with MTO Transportation corridor and current load forecast.

3.5.2 Southern Sub-region

This sub-region comprises parts of the municipalities of Mississauga and Oakville.

The Study Team determined that the needs identified for this sub-region can be addressed directly by the transmitter and LDCs through LP. These LP needs are summarized in the GTA West RIP and include the following:

- To address the supply capacity issue at Erindale TS T1/T2 (230/27.6kV), the RIP report recommended that Alectra Utilities Inc. build a new 44/27.6kV distribution station to utilize extra capacity on the 44kV system. The LDC will carry out the work with a planned in-service date of 2018-2019.
- Loading limitations on 230 kV circuits between Richview TS and Trafalgar TS is being further assessed as part of the IESO-led Bulk System Planning study. Although Bulk System Planning is outside the scope of regional planning, the Study Team will be provided an update on the outcome of the assessment to ensure coordination.

The next cycle of Regional Planning for the GTA West Region is currently anticipated to commence in Q1 2018.

3.6 Kitchener-Waterloo-Cambridge-Guelph (KWCG)

The KWCG region includes the municipalities of Kitchener, Waterloo, Cambridge and Guelph, as well as portions of Perth and Wellington Counties and the Townships of Wellesley, Woolwich, Wilmot and North Dumfries.

The RIP was completed in December 2015 and recommended regional plans are being monitored by Hydro One for timely completion.

The following transmission projects were developed by Hydro One to address near-term supply needs:

- The Guelph Area Transmission Refurbishment Project (GATR) is now complete and was placed in service in Q4 2016.
- The switching facilities work at Galt Junction to improve supply reliability in the Cambridge and Kitchener areas is currently planned to be in service in Q4 2017.

The next cycle of Regional Planning for this region is currently anticipated to commence in Q2 2018.

3.7 Toronto Area

The Toronto Area (formerly referred to as Metro Toronto) Region comprises the municipality of Toronto and it includes the area roughly bordered geographically by Lake Ontario to the south, Steeles Avenue to the north, Highway 427 to the west and Regional Road 30 to the east. For the purpose of regional planning, the region was divided into two sub-regions: Central Toronto Area and Northern sub-regions.

The second cycle NA for this region was completed in October 2017 and recommended regional plans are being monitored by Hydro One for timely completion. An update is provided below.

3.7.1 Central Toronto Area Sub-region

The Central Downtown sub-region includes the core of the city, and is made up mainly of commercial towers, multi-unit residential and condominium towers, and mixed residential and commercial land uses. Electricity to this area is mainly supplied by the 115kV Hydro One transmission system. It includes the area extending northward from Lake Ontario to Highway 401, westward to the Humber River, and eastward to Victoria Park Avenue.

The new needs identified in the second cycle NA include the following:

- East Harbor / Port Lands Area Transformation Capacity: The LDC has identified an emerging area of load growth in the East Harbor and Port Lands in Toronto. The current load in the area is supplied from Esplanade TS and Basin TS. Transformation capacity in the area is sufficient with present day loading however, due to the area's load growth potential there may be a need for increased capacity around 2025+. The recommended plan is further regional coordination in the IRRP and RIP phase to review options and identify a preferred plan.
- Load restoration: For the loss of circuits, C14L+C17L, C5E+C7E, and K3W+K1W the load interrupted by configuration can exceed 150 MW or 250 MW and are required to be restored within the prescribed time periods as stated in the ORTAC. The recommended plan is further regional coordination in the IRRP and RIP phase to review options and identify a preferred restoration plan.

Several EOL equipment were also identified for replacement in the Toronto Region during the second cycle NA.

- The Study Team recommended that the following EOL equipment does not require further regional coordination and will be replaced with similar type of equipment with the same or higher ratings. This was based on factors such as: cost, long term load growth in the area, and efficient and effective/maximum use of land and station facilities, and greater operational flexibility and system resiliency during emergency and extreme weather conditions.
 - Bridgman TS T11/T12/T13; Cecil TS T1; Charles TS T3/T4; Dufferin TS T1/T3; Fairbank TS T1/T3, T2/T4; Fairchild TS T1/T2; Runnymede TS T3/T4, 115 kV line grounding switches; Richview TS T2, 230kV breakers; Sheppard TS T3/T4; Strachan TS T12; 115kV H7L/H11L Underground Cable Main TS to Lumsden JCT and Todmorden JCT to Leaside TS

- The Study Team recommended the following EOL equipment requires further regional coordination to further review options and develop a preferred replacement plan:
 - Bermondsey TS T3/T4; John TS T1, T2, T3, T4, T6, 115 kV breakers; Main TS T3/T4, 115 kV line disconnect switches, installation of 115 kV CVTs; Manby TS T7, T9, T12 autotransformers, T13 step-down transformer, and, rebuild 230kV yard; 115kV C5E/C7E Underground Cable Esplanade TS to Terauley TS; 115 kV H1L/H3L/H6LC/H8LC Overhead Line Bloor St. JCT to Leaside JCT; 115kV L9C/L12C Overhead Line Leaside TS to Balfour JCT

The following transmission projects were developed to address near- and medium-term needs that were identified in the RIP and have been reaffirmed during the second cycle NA:

- West Toronto Area Station and Line Capacity: This project includes adding a new 115/27.6kV DESN at the Runnymede TS site and upgrading the respective 115kV circuits, K1W/K3W/K11W/K12W. This project is progressing as planned and is expected to be in service in Q4 2018.
- Southwest Toronto Station Capacity: This project includes adding a new 230/27.6kV DESN at the Horner TS site. New distribution feeder ties are also required to be built between Manby TS and Horner TS by THESL to accommodate load transfer out of Manby TS to Horner TS as the loading at Manby TS exceeds its capacity.
- Downtown District Station Capacity: This project includes adding a second 115/13.8kV DESN at the Copeland MTS site (Phase 2). Phase 1 is planned to be in service in 2018. Based on the station capacity consideration alone for the Downtown District stations, the need date for Phase 2 is in the medium to long term. However, based on the other considerations identified by the LDC (such as requirements for spare feeder positions), the need date may be earlier in the medium term. The recommended plan is for the LDC to further refine the need and timing through their distribution planning process and include in updates to the next IRRP and/or RIP.
- Richview TS to Manby TS Corridor Line Capacity will be required around 2020. The recommended plan is staged as follows:
 - Stage 1: Rebuild existing 115kV idle line to 230kV and reconfigure two existing circuits R2K and R15K into “Super-circuits”
 - Stage 2: Terminate the new conductors on VxR circuits and Manby TS (3 new breakers) and complete station work coincident with Manby TS EOL replacement work planned in 2023-2024
- Breaker Failure at Manby TS: A potential supply security risk at Manby TS is being addressed by Hydro One by installing a special protection scheme (SPS) to protect equipment overloading. The project is progressing as planned and is expected to be in service in 2018.
- Several long term needs including: 230/115 kV Transformation Capacity and Voltage Collapse at Leaside TS; 230/115 kV Transformation Capacity at Manby TS; and, 115 kV Line Capacity for Leaside TS to Wiltshire TS Corridor, Manby West to Riverside Junction, and Don Fleet TS to Esplanade TS (medium term need)

3.7.2 Northern Sub-region

The Toronto Northern sub-region includes the area roughly bordered geographically by Highway 401 on the south, Steeles Avenue on the north, Highway 427 on the west and Regional Road 30 on the east in addition to the area east of the Don Valley Parkway and north of O'Connor Dr. This Sub-region comprises the northern portion of the municipality of Toronto.

The NA for the Toronto Northern sub-region had identified that line capacity of circuit C10A was restricted due to inadequate clearance from underbuilt street lighting and distribution line. As reported last year, the field surveys carried out by Hydro One have confirmed that the limiting underbuilds have been removed and the restrictions on line capacity are removed.

The second cycle NA for the Toronto Region is complete and is now in the SA/IRRP phase.

3.8 Northwest Ontario

The Northwest Ontario region is a large geographic area, stretching from the town of Marathon to the western and northern borders of the province, with diverse characteristics. Therefore this region has been divided into four sub-regions for the purpose of regional planning: North of Dryden, Greenstone-Marathon, Thunder Bay and West of Thunder Bay sub-regions.

The RIP for this region was completed in June 2017.

3.8.1 North of Dryden Sub-region

This includes the portion of the Northwest Ontario Region north of the cities of Dryden and Kenora that includes Ear Falls, Red Lake and Pickle Lake. The sub-region has residential, commercial and mining load, as well as hydroelectric generation. This sub-region will supply the Remote Communities and has the potential for supplying the future Ring of Fire mining load.

Planning for the North of Dryden sub-region started prior to the implementation of the new regional planning process. The IESO issued the IRRP report in January 2015. The report identified a potential need for increased capacity to meet the anticipated increased demand from the mining sector, including the potential for supply to the Ring of Fire, and connection of the Remote Communities. As mentioned in the previous report, currently, there are two transmission infrastructure investments being developed to meet the near-term electricity needs north of Dryden:

- building a new 230 kV transmission line from the Dryden/Ignace area to Pickle Lake (developed by another transmitter with Hydro One offering a connection to its system)

- need for additional capacity to be addressed by upgrade the existing transmission lines from Dryden to Ear Falls and from Ear Falls to Red Lake (115 kV line - E4D) (currently on hold due to insufficient load)

Ring of Fire Sub-System Need

The North of Dryden IRRP indicated that since the Ring of Fire area is remote from the existing transmission system, any additional capacity needs would require new facilities. It indicated that transmission system connection is the most economic option when compared to diesel generation. Development in the area is still at an early stage and no firm recommendations are made at this time.

3.8.2 Greenstone-Marathon Sub-region

This sub-region covers the southeastern portion of the Northwest Ontario Region. The sub-region has distribution load and light industry, with a proposal for a new mine and future potential mines.

For the Greenstone-Marathon sub-region, the IRRP was published in June 2016.

To meet the forecast demand from LDCs, as reported last year, no new system enhancements are required. Accordingly, new industrial and/or mining loads will be monitored and investments will be initiated once formal connection requests are received from the customer(s).

3.8.3 Thunder Bay Sub-region

This sub-region includes the city of Thunder Bay and its vicinity. The sub-region has residential, commercial and industrial load, as well as dispatchable and embedded generation, supplied by the distribution and transmission facilities.

The RIP for the region identified potential need to upgrade the thermal rating of circuit R2LB and the work has been completed.

Port Arthur TS - Transformation Capacity

The limiting low voltage equipment at Port Arthur is nearing end-of-life and is planned to be replaced and upgraded in the mid-term. This upgrade would bring the station capacity up to 59 MW, sufficient to meet the need beyond 2035. No additional plan is required at this time and load at Port Arthur TS will be monitored and supply options will be assessed in the next regional planning cycle.

Lakehead TS and Birch TS - Transformation Capacity

Currently the Thunder Bay 115 kV system can accommodate approximately 150 MW of additional load growth. Under the high load growth scenario, the Thunder Bay system would require

additional supply capacity of approximately 20 MW by 2030. Therefore a potential long-term solution may be required, however no immediate action is recommended beyond monitoring of the sub-system load growth.

3.8.4 West of Thunder Bay Sub-region

This includes the portion of the Northwest Ontario region from of the western boundary of Thunder Bay sub-region up to and including the cities of Dryden and Kenora in the north. The sub-region has residential, commercial and mining load, as well as bio-mass and hydroelectric generation. It supplies the North of Dryden sub-region and, in the future, will supply the Remote Communities, when the generation in that sub-region is insufficient to meet the demand. Several LDCs serve the customers in this sub-region.

The RIP and the IRRP recommended monitoring electricity demand growth closely to determine if and when a decision on Dryden 115kV subsystem is required. As reported previously, the Study Team will also ensure communities are informed of all the bulk, coordinated regional, distribution and community energy planning activities.

The next cycle of Regional Planning for this region is currently anticipated to commence in Q4 2018.

3.9 Windsor-Essex

The Windsor-Essex region includes the most southerly portion of Ontario, extending from Chatham southwest to Windsor. It consists of the City of Windsor, the Municipality of Leamington, the Town of Amherstberg, the Town of Essex, the Town of Kingsville, the Town of Lakeshore, the Town of LaSalle, the Town of Tecumseh, and the Township of Pelee, as well as the western portion of the Municipality of Chatham-Kent.

The RIP for this region, completed in December 2015, identified the Supply to Essex County Transmission Reinforcement (SECTR) project to address supply interruptions in the J3E/J4E subsystem, as well as to provide additional supply capacity in the Kingsville-Leamington area. The SECTR project consists of installation of a new transformer station (Leamington TS), and 13 km 230 kV double-circuit to connect Leamington TS to the existing C21J/C22J. The project is currently progressing as expected and will be completed in Q2 2018.

The second cycle of regional planning was triggered in 2017 and NA for the region was completed in October 2017. Emergent new needs in the region are due to forecasted increase of greenhouse loads and the first cycle plans such as SECTR project will not be able to fully address the load restoration challenges in the J3E/J4E sub-system as anticipated previously. This load restoration need will be further assessed in IESO-led Scoping Assessment.

Following additional needs have also been identified in the NA:

- Leamington TS may require additional station supply capacity by 2021. This need will be further assessed in the Scoping Assessment, along with the other restoration needs.
- Kingsville TS T1/T2/T3/T4 transformers. As the result of significant increase in load in the Kingsville area, Hydro One is planning to replace the 4x42MVA transformers with 2x83MVA units by the end of 2019.
- Keith TS EOL T11/T12 autotransformers, to be replaced with larger 250MVA units, to improve load supply and restoration capability for the 115kV J3E/J4E subsystem. This work is currently planned to be completed in 2023.
- Crawford TS EOL T3 transformers, to be replaced with similar 83MVA unit in 2017.
- Malden TS EOL 27.6kV breakers, to be replaced with SF6 equivalent units in 2018.
- Lauzon TS EOL T1/T2 autotransformers and T6/T7 step down transformers, currently planned for replacement with similar size units by 2025. This need will be further assessed in the Scoping Assessment.

4. STATUS OF GROUP 2 REGIONS

Regions were prioritized into three groups based on their anticipated near-term and mid-term needs and the urgency to address them. Group 2 regions were expected to have fewer and less urgent needs than regions in Group 1. This expectation was supported by the Group 2 NAs. Group 2 consists of the following regions:

- East Lake Superior (Led by Hydro One Sault Saint Marie)
- London Area
- Peterborough to Kingston
- South Georgian Bay/Muskoka
- Sudbury/Algoma

The RIPs for all Group 2 Regions are now complete.

4.1 East Lake Superior

The lead transmitter for the region is Hydro One Sault Saint Marie. The regional transmission system connects with provincial grid at Wawa TS and Mississagi TS, north of Thessalon. During the last regional planning, there were no new needs identified in this region and Hydro One Sault Saint Marie will not be submitting a separate Annual Status Report for this region.

4.2 London Area

The London Area includes the Cities of Woodstock, London and St. Thomas as well as the Counties of Middlesex, Elgin and Oxford.

The RIP for the region was completed in August 2017. The London Area region was divided into five sub-regions based on electrical supply boundaries for further regional planning purposes:

4.2.1 Greater London Sub-region

The Greater London sub-region is a summer-peaking area that includes the City of London, and customers in surrounding municipalities supplied from Buchanan DESN, Clarke, Highbury, Nelson, Talbot, and Wonderland transformer stations (TS). This sub-region includes customers of London Hydro and Hydro One Distribution, supplied by Buchanan DESN TS, Clarke TS, Highbury TS, Nelson TS, Talbot TS, and Wonderland TS.

Recent condition assessment of Wonderland TS identified like-to-like replacement of one Transformer T5 and the work will be carried out in near term. In addition, two load restoration needs were identified in this sub-region: Loss of W36/W37 (Clarke TS and Talbot TS), and Loss of W42L/W43L (Buchanan TS). For the loss of W36/W37, the Study Team recommended the implementation of automated switching devices and feeder extensions on the distribution system. No further action is required for the loss of W42L/W43L, as load transfer and temporary fixes/emergency by-pass solutions are possible.

4.2.2 Aylmer-Tillsonburg Sub-region

Aylmer- Tillsonburg sub-region includes city of Aylmer, city of Tillsonburg and surrounding areas within service territories of Erie Thames Powerlines, Tillsonburg Hydro, and Hydro One Distribution, supplied by Aylmer TS and Tillsonburg TS.

Needs identified in this sub-region include: voltage constraint at Tillsonburg TS; thermal constraint at 115kV circuit W8T section between Buchanan TS and Edgeware JCT; and sub-standard customer delivery performance at Tillsonburg TS. As per the Study Team recommendation, Hydro One is currently developing budgetary estimates for each of the proposed alternatives to evaluate their cost and benefits.

4.2.3 Strathroy Sub-region

This sub-region includes Strathroy TS that supplies the Middlesex County and townships of Adelaide-Metcalf, Warwick, Strathroy-Caradoc via Entegrus and Hydro One Distribution.

4.2.4 Woodstock Sub-region

Woodstock region includes town of Ingersoll, City of Woodstock and rest of northern part of Oxford County, supplied by Ingersoll TS, Woodstock TS, Commerce Way TS, and Karn TS.

A load restoration need was identified in this sub-region as the result of simultaneous loss of 230kV circuit M31W/M32W and this need has been further assessed in a Local Plan completed in May

2017. Based on load forecast and transfer capability information, it was determined that there is sufficient transfer capability in the existing system, and therefore no further action is required.

4.2.5 St. Thomas Sub-region

This sub-region includes city of St. Thomas and surrounding areas supplied by Edgeware TS and St. Thomas TS via distribution network of St. Thomas Energy Inc., London Hydro, and Hydro One Distribution. The Study Team determined that no further regional coordination was required for the sub-region.

The next cycle of Regional Planning for this region is currently anticipated to commence in 2019-2020.

4.3 Peterborough to Kingston

The Peterborough to Kingston Region includes the area roughly bordered geographically by the municipality of Clarington on the West, North Frontenac County on the North, Frontenac County on the East and Lake Ontario on the South.

The Study Team determined that no further regional coordination required for the region. A local plan was developed for addressing the local need of load balancing at Gardiner TS and was implemented in Q4 2016. Hydro One published a RIP in July 2017.

The next cycle of Regional Planning for this region is currently anticipated to commence in 2019-2020.

4.4 South Georgian Bay/Muskoka

The geographical area of the South Georgian Bay/Muskoka Region is the area roughly bordered by West Nippising on the North-West, the Algonquin Provincial Park on the North-East, Scugog on the South, Erin on the South-West and Grey Highlands on the West.

The RIP report for this region was completed in August 2017. The region was divided into following two sub-regions during scoping phase: Barrie/Innisfil and Parry Sound/Muskoka sub-regions.

4.4.1 Barrie/Innisfil Sub-region

The Barrie/Innisfil sub-region includes the areas supplied by Midhurst TS, Barrie TS, Everett TS, and Alliston TS, and transmission circuits E8V/E9V, E3B/E4B, and M6E/M7E. It is forecasted to experience significant load growth, limiting station and line capacity and the end of life equipment replacements. Hydro One together with IESO and all LDCs in the sub-region have developed a plan to replace the aging infrastructure while addressing the limiting capacity issues. The plan includes uprating 115kV lines E3/4B to 230 kV, upgrading existing DESN transformer from 115/44 kV,

55/92 MVA to 230/44 kV, 75/125 MVA and adding additional feeders to Barrie DESN. The project is planned to be in-service by 2020/2021.

4.4.2 Parry Sound/Muskoka Sub-region

The Parry Sound / Muskoka sub-region includes the areas supplied by Parry Sound TS, Waubaushene TS, Orillia TS, Bracebridge TS, Muskoka TS, and Minden TS, and transmission circuits M6E/M7E and E26/E27. It has a station capacity need and based on the current load forecasts, additional transformation capacity relief is required for both Parry Sound TS and Waubaushene TS to accommodate the load growth and improve reliability in this sub-region.

In order to address this need replacing both transformers at Parry Sound TS (advancing the replacement of one which is not nearing end-of-life) by two standard 50/83MVA units by 2021 will address the issue and will eliminate building of sub-transmission line.

There was also a load restoration need in the region for the loss of two transmission elements (M7E/M6E transmission lines) and the Study Team recommended to install motorized disconnect switches (MDS) at the Orillia TS junction by 2021 at the cost of \$5-7M. This installation will allow restoration of load as per ORTAC criteria. The development work is currently in progress.

There are end of life needs at Minden TS which require equipment replacement in 2020-2021. The existing 230/44 kV T1 and T2 three-phase power transformers and associated ancillary equipment will be upgraded with the standard size 230/44 kV three-phase power transformers. As a result, the rating of transformers will also increase from 25/33/42 MVA to 50/66.7/83.3 MVA.

It is worth noting that there are potential bulk power system elements that are also at the end of their useful lives. These include 230 kV transmission lines D1M/D2M, E8V/E9V, and M6E/M7E. IESO will undertake the bulk power system studies for these lines in coordination with Hydro One.

The next cycle of Regional Planning for the South Georgian Bay/Muskoka region is currently anticipated to commence in 2019-2020.

4.5 Sudbury/Algoma

The Sudbury/Algoma region includes the municipalities of Greater Sudbury and Espanola and surrounding areas. There are municipal LDCs serving each of those municipalities and Hydro One Distribution serves the remainder of the Region. The area is supplied from transformer stations Clarabelle TS, Coniston TS, Elliot Lake TS, Larchwood TS, Manitoulin TS and Martindale TS.

Hydro One has developed and published a RIP report in June 2016. The Study Team determined that no further regional coordination was required.

The next cycle of Regional Planning for the Sudbury /Algoma region is currently anticipated to commence in 2019-2020.

5. STATUS OF GROUP 3 REGIONS

Group 3 consists of the following regions:

- Chatham/Lambton/Sarnia
- Greater Bruce/Huron
- Niagara
- North of Moosonee (led by Five Nations Energy Inc.)
- North/East of Sudbury
- Renfrew
- St. Lawrence

The RIPs for all the six (out of seven) regions where Hydro One is the lead transmitter are now complete. Five Nations Energy Inc. is the lead transmitter for North of Moosonee and will provide a status update for this region.

5.1 Chatham/Lambton/Sarnia

The Chatham-Lambton-Sarnia region is located to the west of the Greater Toronto Area in southwestern Ontario. The region includes the municipalities of Lambton Shores and Chatham-Kent. It also includes the Townships of Petrolia, Plympton-Wyoming, Brooke-Alvinston, Dawn-Euphemia, Enniskillen, St. Clair, Warwick and the Villages of Oil Springs and Point Edward.

Hydro One developed and published a RIP in August 2017. The Study Team determined that no further regional coordination is required. To address the local capacity need for transformer T3 at Kent TS, Hydro One and relevant distributors developed a LP. It was concluded in the LP that there is sufficient transfer capability in the existing distribution system to reduce loading on Kent TS T3 following a loss of T4 and there are no immediate actions required.

The region has EOL component replacement needs for Scott TS and St. Andrews TS, which are planned to be completed by 2022.

The next cycle of Regional Planning for this region is currently anticipated to commence in 2020-2021.

5.2 Greater Bruce/Huron

The Greater Bruce/ Huron area is located to the west of the Greater Toronto Area in southwestern Ontario. The region includes the municipalities of Arran–Elderslie, Brockton, Kincardine, Northern Bruce Peninsula and South Bruce. It also includes the township of Huron-Kinloss.

Hydro One developed and published the RIP report in August 2017. The Study Team determined that no further regional coordination is required.

The next cycle of Regional Planning for this region is currently anticipated to commence in 2020-2021.

5.3 Niagara

The Niagara Region comprises the municipalities of City of Port Colborne, City of Welland, City of Thorold, City of Niagara Falls, Town of Niagara-On-The-Lake, City of St. Catharines, Town of Fort Erie, Town of Lincoln, Township of West Lincoln, Town of Grimsby, Township of Wainfleet, and Town of Pelham. Haldimand County has been included in the Niagara Region Group 3 for NA.

Hydro One developed and published the RIP report in March 2017. The potential overloading of circuit Q4N, as identified by the Study Team, will be addressed under sustainment project to be complete in Q4 2019.

The next cycle of Regional Planning for this region is currently anticipated to commence in 2020-2021.

5.4 North/East Sudbury

The geographical area of the North/East of Sudbury Region is the area roughly bordered by Moosonee on the North, Hearst on the North-West, Ferris South and Kirkland Lake on the East.

Hydro One developed and published a RIP in April 2017. The Study Team determined that no further regional coordination was required.

The next cycle of Regional Planning for this region is currently anticipated to commence in 2020-2021.

5.5 Renfrew

The Renfrew Region includes all of Renfrew County.

Hydro One developed and published a RIP report in July 2016. The Study Team determined that there were no needs in the region and no further regional coordination was required.

The next cycle of Regional Planning for this region is currently anticipated to commence in 2020-2021.

5.6 St. Lawrence

The St Lawrence Region covers the southeastern part of Ontario bordering the St Lawrence River. The region starts at Gananoque on the eastern end of Lake Ontario and extends to the inter-provincial boundary with Quebec. The City of Cornwall is supplied by Fortis Ontario with transmission lines from Quebec and is not included in this Region.

Hydro One developed and published a RIP report in July 2016. The Study Team determined that there were no needs over the next 5 years in the region and no further regional coordination was required.

The next cycle of Regional Planning for this region is currently anticipated to commence in 2020-2021.

6. LESSONS LEARNED

Throughout the first cycle of the regional planning process, several lessons and opportunities for improvement were identified pertaining to the regional planning process and its deliverables. These improvements were identified following a thorough review of the regional planning process and reports from the first cycle, and also through discussions with regional Study Teams consisting of LDCs and IESO, and input from the OEB Regional Planning Process Advisory Group (“RPPAG”). Based on the lessons learned, Hydro One has implemented improvements to its regional planning reports and suggested changes to the PPWG report. Some examples of these enhancements are described below:

Improvements in data gathering:

- Data gathering templates – more clarity and consistency in request for data in order to reconcile the data quicker.
- Load forecast methodology under development in coordination with IESO and LDCs – will improve data accuracy (retrieving actual load, new technology, basis of extreme weather correction factor, forecasting methodology, applying CDM and DG).

Improvements in reporting of analysis and plans:

- Comprehensive discussion and assessment of major HV equipment reaching the end of its useful life within NA reports. As part of this analysis different options are evaluated and discussed based on load forecasts for growth that takes into account changing customer requirements and the impact of new technologies. The assessment includes, but not limited to: downsizing/eliminating/right sizing equipment by transferring load to other existing facilities; replacing equipment with similar equipment of same or higher ratings; and, consideration of economic and practical implementation of incremental CDM to defer or eliminate the need while maintaining safe and reliable service to customers.
- Regional planning report templates – various updates, including new section on EOL equipment assessment and new comprehensive template for RIP reports for all regions.

Process Improvements:

- Revised Local Planning guidelines within PPWG report to aid the Study Team in determining when LP is the appropriate approach to address a specific need(s).
- Revised Regional Planning Process flow diagrams within PPWG report to reflect process more clearly.
- Ensure consistency in terminology within PPWG report and regional planning reports.
- Further enhancements to be made to clarify the scope and planning approach for EOL equipment needs in regional planning reports.

Hydro One has also sent formal communication to LDCs to seek their feedback on prioritization of regions, schedule, and suggestions for enhancements in the next cycle.

7. LDC SURVEYS

As previously reported, in an on-going effort to ensure that the Regional Planning process meets the objectives that were laid out in the PPWG report, Hydro One conducted three surveys from 2014-2016 to seek the views of the LDCs. The surveys were conducted for the LDCs who participated in the NA and the RIP phases led by Hydro One¹.

The surveys questions covered the following broad areas from the point of view of the LDCs:

- Understanding the regional planning process objectives;
- Participation in the regional planning process and decision making;
- Representation of LDCs needs and issues in the final report;
- Positive aspects of the process and any suggestions for improvement.

The conclusion of these surveys was very positive feedback from the LDCs. Overall there is a consensus among the LDCs that the Hydro One led RIP and NA phases were:

- Understood by Study Team members and proceeded smoothly;
- Inclusive of LDCs in the decision process;
- Aligned with LDCs requirements; and,
- Transparent and had open discussions.

In 2017, the Electricity Distributors Association (EDA) also conducted a survey of its LDC members on the Regional Planning process. The conclusion of this survey was that the regional planning process and reports were very useful in:

- Identifying required regional investments;
- Development of the distribution system plan in terms of local planning, load forecasting and identification of future capacity needs and requirements;
- Supporting future rate applications

One other area that was identified for improvement was consistency in load forecasting methodology. Hydro One and IESO are in the process of developing a more standardized methodology to address this concern.

Apart from the surveys, Hydro One has also recently sent formal communication to LDCs to seek any additional suggestions for enhancements in the next cycle of regional planning.

¹ The survey for NAs completed for Group 1 was reported in the 2014 Annual Status Report. The surveys for NAs completed for Group 2 and 3 and for RIPs completed for Group 1 were reported in the 2016 Annual Status Report.

8. CONCLUSION

The first regional planning cycle is complete. It followed the process developed by the Process Planning Working Group (“PPWG”) that the OEB established. Members from the IESO, LDCs and Hydro One transmission are represented on Study Teams during the various phases of the regional planning process. Team members have been able to make decisions and undertake the appropriate level of planning based on the assessment of needs. For example, the concept of LP is being effectively used by the Study Team to address needs that are local in nature where straight forward wires only options are the obvious and appropriate solution. These needs do not require further regional coordination and are directly addressed by the transmitter and affected LDC(s) (or customers). Other needs were further assessed by the Study Team during the IRRP and RIP phases of the regional planning process. Frequently, ‘wires’ planning is initiated in parallel with IRRP when the Study Team determines that a wires approach is the best alternative to address a need.

The sharing of information by the Study Team members and the publishing of reports and other relevant information on the Hydro One and IESO websites allows stakeholders to be aware of current and future plans that may influence their planning strategies. This transparency and stakeholder engagement was intended as one of the hallmarks of the regional planning process as envisioned by the Board.

Since the regional planning process was introduced, Hydro One, LDCs, and the IESO have met mandatory timelines to complete each of the regional planning phases with the exception of one IRRP for a sub-region of Northwest Ontario IRRP. Other key accomplishments since the last report include completion of:

- 9 RIP reports;
- 4 IRRP reports;
- 5 LP reports;
- 3 NA reports (second cycle);
- Improvements in: data gathering, reporting of analysis and plans, and regional planning process

From a wires infrastructure perspective, the RIP for a region is the most important phase in the regional planning process because it provides a comprehensive source of information for regional power system infrastructure (wires) plans. Specifically, the RIP provides a report to address all the needs in the regions including a consolidated account of infrastructure plans developed during NA, LP and IRRP for the region.

RIP reports for the remaining three regions in Group 1 (namely Burlington to Nanticoke, GTA East, and North West Ontario), two remaining regions in Group 2 and four remaining regions in Group 3 regions were also completed this year.

The second cycle of regional planning is initiated and the Needs Assessment for Burlington to Nanticoke, Toronto and Windsor-Essex regions in Group 1 is complete and the Scoping Assessment for these regions is in progress.

9. REFERENCES

- [1] Ontario Energy Board. "Transmission System Code". Last Revised August 26, 2013 (Originally Issued on July 14, 2000).
- [2] Hydro One Networks Inc. "Regional Planning Process – Annual Status Report". November 1, 2016.
- [3] Ontario Energy Board. "Distribution System Code". Last Revised May 18, 2017 (Originally Issued on July 14, 2000).
- [4] "Planning Process Working Group Report to the Board – The Process for Regional Infrastructure Planning in Ontario". March 13, 2013. Last Revised May 17, 2013.
- [5] Ontario Energy Board. "Conservation and Demand Management Requirement Guidelines For Electricity Distributors". Last Revised December 19, 2014.
- [6] Independent Electricity System Operator. "Ontario Resource and Transmission Assessment Criteria (ORTAC)". Issue 5.0. August 22, 2007.

APPENDIX A. CONSERVATION, DISTRIBUTED GENERATION, AND OTHER INITIATIVES

A.1 Conservation Achievement

The table below shows the most recently available verified peak demand offsets resulting from conservation energy efficiency programs by LDCs. Because verified results only become available in August 2017 for the previous calendar year, the data shown is based on 2016 (inclusive of programs and persistence from 2011 through 2015). These savings do not include the impact due to system wide demand response initiatives, such as Capacity Based Demand Response (CBDR) and the DR Auction. As CBDR was a transitional program, information was not collected by LDC. Currently DR Auction results are reported at IESO zones. Efforts are being made to track granularity of results by LDC so that the impact can be included in future conservation achievement results. Due to the methodology used in monitoring and evaluating programs, verified results can only be provided by LDC, and not by planning region.

Table 3. Conservation Status Update

Subregion	LDC	Verified Net Annual Peak Demand Savings from Conservation Energy Efficiency Programs, Persisting in 2016 (MW)
Barrie/Innisfil	InnPower Corporation	0.9
	Alectra Utilities	*
	Hydro One Distribution	*
	Total**	0.9
Brant	Brantford Power Inc.	9.2
	Energy+ Inc.	*
	Hydro One Distribution	*
	Total**	9.2
Bronte	Burlington Hydro	9.2
	Oakville Hydro	8.3
	Total**	17.5
Central Toronto	Toronto Hydro	172.1
Greenstone-Marathon	Hydro One Distribution	*
Greater London	London Hydro	17.6
	Hydro One Distribution	*
	Total**	17.6
KWCG	Kitchener-Wilmot Hydro	10
	Waterloo North Hydro	7.2
	Guelph Hydro Electric Systems Inc.	13.3
	Energy+ Inc.	12
	Hydro One Distribution	*
	Total**	42.5
North of Dryden	Hydro One Distribution	*

Subregion	LDC	Verified Net Annual Peak Demand Savings from Conservation Energy Efficiency Programs, Persisting in 2016 (MW)
Northwest GTA	Hydro One Brampton	25.1
	Milton Hydro	3.5
	Halton Hills Hydro	2.1
	Hydro One Distribution	*
	Total**	30.7
Ottawa	Hydro Ottawa Limited	45.9
	Hydro One Distribution	*
	Total**	45.9
Pickering-Ajax-Whitby	Veridian Connections	11.8
	Whitby Hydro	3.9
	Hydro One Distribution	*
	Total**	15.7
Parry Sound/Muskoka	Lakeland Power Distribution Ltd.	1.2
	Midland Power Utility Corporation	1.3
	Orillia Power Distribution Corporation	2.2
	Alectra Utilities	*
	Hydro One Distribution	*
	Newmarket-Tay Power Distribution Ltd.	*
	Veridian Connections Inc.	*
	Total**	4.7
Thunder Bay	Thunder Bay Hydro Electric Distribution Inc.	5.9
	Hydro One Distribution	*
	Total**	5.9
Windsor-Essex	Essex Powerlines Corporation	2.9
	E.L.K Energy Inc.	1
	Entegrus Inc.	5.9
	Hydro One Distribution	*
	Total**	9.8
West of Thunder Bay	Fort Frances Power	0.46
	Atikokan Hydro	0.07
	Kenora Hydro	0.28
	Sioux Lookout Hydro	0.16
	Hydro One Distribution	*
	Total**	0.97
York	Alectra Utilities	62.7
	Newmarket Tay Power Distribution Ltd	4.4
	Hydro One Distribution	*
	Total**	67.1

Notes [*]:

- **Hydro One Distribution** total conservation savings for 2016 is 108.7MW, which is the total achievement for all Hydro One Distribution service territory.
- **Alectra Utilities** total conservation savings in 2016 is 62.7MW for former PowerStream Inc. service territory only.

- **Energy+ Inc.** conservation achievement, including persisting savings, for 2016 is 12MW. The large majority of load is within the KWCG region, with a minority of load in the Brant subregion.
- **Newmarket-Tay Power Distribution Ltd.** total conservation achievement for 2016 is 4.4MW. (The large majority of Newmarket-Tay Power Distribution Ltd. load is outside the Parry Sound/Muskoka subregion).
- **Veridian Connections Inc.** total conservation achievement for 2016 is 11.8MW. (The large majority of Veridian Connections Inc. load is outside the Parry Sound/Muskoka subregion).

Notes []:**

- Total conservation achievement for the subregion may not include some of the LDC(s) achievement, whose load is spread over multiple subregions.

A.2 Distribution Generation

The table below shows the total installed and effective capacity of IESO Contracted Distributed Generation (“DG”) projects which have come into service or under development since the base year of the region/subregion load forecast. This does not include net or behind the meter generation. This table does not include projects which had already been in service prior to this date, except in cases where a new contract was formed to account for incremental capacity of a facility.

The equivalent effective capacity for these new generation sources is based on capacity factors consistent with the zonal assumptions applied in the region/subregion load forecast. Data is based on the IESO contract list as of July 31, 2017.

Table 4. DG Status Update

Subregion	Station	Installed Capacity (MW)	Effective Capacity (MW)	Base Forecast Year
Barrie/Innisfil	BARRIE TS	0.52	0.11	2014 Peak
	MIDHURST TS	14.95	3.29	
	EVERETT TS	1.49	0.33	
	ALLISTON TS	1.86	0.41	
	TOTAL	18.82	4.14	
Brant	BRANT TS	0.258	0.1	2012 Peak
	BRANTFORD TS	0.896	0.4	
	POWERLINE MTS	1.22	0.49	
	TOTAL	2.37	0.95	
Bronte	BRONTE TS	1.9	0.65	2014 Peak
	CUMBERLAND TS	2.01	0.68	
	BURLINGTON DESN	0.72	0.25	
	PALERMO TS	0	0	
	TRAFALGAR DESN	0	0	
	TREMAINE TS	0.77	0.26	
	GLENORCHY MTS	1.24	0.42	
	OAKVILLE #2 TS	0.46	0.16	
	TOTAL	7.11	2.42	
Central Toronto	AGINCOURT	3.45	1.17	2013 Peak

Subregion	Station	Installed Capacity (MW)	Effective Capacity (MW)	Base Forecast Year
	BASIN	0.13	0.05	
	BATHURST TS DESN1	2.79	0.95	
	BATHURST TS DESN2	1.48	0.5	
	BERMONDSEY TS DESN1	0.56	0.19	
	BERMONDSEY TS DESN2	2.1	0.71	
	BRIDGMAN TS DESN1	0.35	0.12	
	BRIDGMAN TS DESN3	0.01	0.004	
	CARLAW TS	0.77	0.26	
	CAVANAGH MTS	2.18	0.74	
	CECIL TS DESN1	0.01	0.005	
	CECIL TS DESN2	0.29	0.1	
	CHARLES TS DESN1	0.01	0.003	
	CHARLES TS DESN2	0.31	0.1	
	DUFFERIN TS DESN1	0.45	0.15	
	DUFFERIN TS DESN2	0.63	0.21	
	DUPLEX TS DESN1	0.06	0.02	
	DUPLEX TS DESN2	0.22	0.08	
	ELLESMERE TS	2.6	0.88	
	ESPLANADE TS	0.07	0.03	
	FAIRBANK TS DESN1	0.68	0.23	
	FAIRBANK TS DESN2	2.12	0.72	
	FAIRCHILD TS DESN1	1.95	0.66	
	FAIRCHILD TS DESN2	0.5	0.17	
	FINCH TS DESN1	3.55	1.21	
	FINCH TS DESN2	4.98	1.69	
	GLENGROVE TS DESN1	0.08	0.03	
	GLENGROVE TS DESN2	0.38	0.13	
	HORNER TS	2.32	0.79	
	JOHN TS DESN2	0.04	0.01	
	JOHN TS DESN3	3.85	3.85	
	LEASIDE TS DESN1	0.34	0.11	
	LEASIDE TS DESN2	0.21	0.07	
	LESLIE TS DESN1	1.32	0.45	
	LESLIE TS DESN2	2.14	0.73	
	MAIN TS	0.76	0.26	
	MALVERN TS	1.92	0.65	
	MANBY TS DESN1	1.57	0.54	
	MANBY TS DESN2	0.62	0.21	
	MANBY TS DESN3	0.79	0.27	
	REXDALE TS	4.47	1.52	
	RICHVIEW TS DESN1	2.78	0.95	
	RICHVIEW TS DESN2	1.88	0.64	
	RICHVIEW TS DESN3	0.01	0	

Subregion	Station	Installed Capacity (MW)	Effective Capacity (MW)	Base Forecast Year
	RUNNYMEDE TS	1.6	0.54	
	SCARBORO TS DESN1	2.37	0.81	
	SCARBORO TS DESN2	2.53	0.86	
	SHEPPARD TS DESN1	1.2	0.41	
	SHEPPARD TS DESN2	2.34	0.8	
	STRACHAN TS DESN1	0.02	0.01	
	STRACHAN TS DESN2	0.01	0.003	
	WARDEN TS	2.3	0.78	
	WILTSHIRE TS DESN1	0.26	0.09	
	WILTSHIRE TS DESN2	0.2	0.07	
	WOODBRIIDGE TS DESN1	0.12	0.04	
	TOTAL	70.68	26.57	
Greenstone-Marathon	LONGLAC TS	0.01	0.003	2014 Peak
	MARATHON DS	0.02	0.006	
	PIC DS	0.01	0.003	
	TOTAL	0.04	0.01	
Greater London	CLARKE TS	1.83	0.67	2016 Peak
	TALBOT TS	0.49	0.18	
	BUCHANAN DESN	0.26	0.09	
	HIGHBURY TS	1.28	0.47	
	NELSON TS		0	
	WONDERLAND TS	0.81	0.3	
	TOTAL	4.66	1.72	
KWCG	ARLEN MTS	0.17	0.05	2010 Peak (July 7, 2010)
	CAMBRIDGE #1	6.21	1.86	
	CAMPBELL TS	8.92	2.68	
	CEDAR TS	2.01	0.6	
	DETWEILER TS	0.02	0.01	
	ELMIRA TS	5.51	4	
	FERGUS TS	48.16	8.79	
	GALT TS	6.21	2.41	
	HANLON TS	1.09	0.33	
	KITCHENER #1	0.42	0.13	
	KITCHENER #3	1.69	0.51	
	KITCHENER #4	1.26	0.38	
	KITCHENER #5	2.58	0.78	
	KITCHENER #6	1.34	0.4	
	KITCHENER #7	1.36	0.41	
	KITCHENER #8	0.96	0.29	
	KITCHENER #9	3.79	1.14	
	PRESTON TS	2.93	0.88	
	PUSLINCH DS	1.25	0.37	
	RUSH MTS	0.32	0.1	

Subregion	Station	Installed Capacity (MW)	Effective Capacity (MW)	Base Forecast Year
	SCHEIFELE TS	4.19	1.26	
	WATERLOO #3	1.57	0.47	
	WOLVERTON DS	0.75	0.22	
	TOTAL	103	28	
North of Dryden	N/A*			
Northwest GTA	BRAMALEA TS	5.94	2.02	2012 Peak
	GOREWAY TS	9.87	3.35	
	HALTON TS	3.15	1.07	
	JIM YARROW MTS	4.56	1.55	
	KLEINBURG TS	5.08	3.86	
	PLEASANT TS	14.45	4.91	
	TREMAINE TS	0.83	0.28	
	WOODBIDGE TS	0.72	0.25	
	TOTAL	44.59	17.29	
Ottawa	ALBION TS	0.92	0.28	2012 Peak
	BILBERRY CREEK TS	0.85	0.26	
	BRIDLEWOOD MTS	0.65	0.2	
	CARLING TS	0.49	0.15	
	CENTER POINT MTS	0.06	0.02	
	CUMBERLAND DS	0.24	0.07	
	CYRVILLE MTS	0.3	0.09	
	ELLWOOD MTS	0.35	0.11	
	FALLOWFIELD DS	0.03	0.01	
	GREELY DS	0.82	0.25	
	HAWTHORNE TS	2.46	0.74	
	HINCHEY TS	0.07	0.02	
	KANATA MTS**	0.83	0.25	
	KING EDWARD TS	0.12	0.04	
	LIMEBANK MTS	0.44	0.13	
	LINCOLN HEIGHTS TS	0.19	0.06	
	LISGAR TS	0.05	0.02	
	MANORDALE MTS	0.04	0.01	
	MANOTICK DS	0.54	0.5	
	MARCHWOOD MTS	0.3	0.09	
	MARIONVILLE DS	0.23	0.07	
	MERIVALE MTS	0.12	0.04	
	MOULTON MTS	0.08	0.02	
	NAVAN DS	0.52	0.16	
	NEPEAN TS	1.81	0.54	
	OVERBROOK TS	0.98	0.29	
	RICHMOND MTS	0.26	0.08	
	RIVERDALE TS**	0	0	

Subregion	Station	Installed Capacity (MW)	Effective Capacity (MW)	Base Forecast Year
	ROCKLAND DS	0.04	0.01	
	ROCKLAND EAST DS	0.06	0.02	
	RUSSELL DS	0.03	0.01	
	RUSSELL TS	2.16	0.65	
	SOUTH GLOUCESTER DS	1.51	0.45	
	SOUTH MARCH TS	1.99	0.6	
	TERRY FOX MTS	0.05	0.01	
	UPLANDS MTS #2	0.15	0.05	
	WENDOVER DS	0.21	0.06	
	WILHAVEN DS	2.06	0.62	
	WOODROFFE TS	0.17	0.05	
	TOTAL	22.18	6.99	
Pickering-Ajax-Whitby	THORNTON TS	0.039	0.013	2016 Peak
	WHITBY TS	0.151	0.047	
	WILSON TS	0.12	0.038	
	TOTAL	0.31	0.098	
Parry Sound/Muskoka	BRACEBRIDGE TS	0	0	2014 Peak (Winter)
	MIDHURST TS DESN1	13.6	0	
	MIDHURST TS DESN2	0.9	0	
	MINDEN TS	4.1	1.4	
	MUSKOKA TS	1.6	0.1	
	ORILLIA TS	0.4	0	
	PARRY SOUND TS	0.3	0	
	WAUBAUSHENE TS	10.2	0	
TOTAL	31.1	1.5		
Thunder Bay	BIRCH TS	0.54	0.02	2014 Peak (January 20, 2014)
	FORT WILLIAM TS	0.09	0	
	MURILLO DS	0.32	0.08	
	NIPIGON DS	0	0	
	PORT ARTHUR TS	0	0	
	RED ROCK DS	0	0	
	TOTAL	25.1	1	
Windsor-Essex	BELLE RIVER TS	2.6	1	2013 Peak (Summer)
	CRAWFORD TS	1	0.4	
	ESSEX TS	1.1	0.4	
	KEITH TS	0.3	0.1	
	KINGSVILLE TS	12.2	3.3	
	LAUZON TS DESN1	5	1.9	
	LAUZON TS DESN2	2.7	1.1	
	MALDEN TS	5	1.9	
	TILBURY TS	0	0	
	TILBURY WEST TS	0	0	
	WALKER TS #1	1.8	0.7	

Subregion	Station	Installed Capacity (MW)	Effective Capacity (MW)	Base Forecast Year		
	WALKER TS #2	0.9	0.3			
	TOTAL	32.6	11.1			
West of Thunder Bay	AGIMAK DS	-	-	2014 Peak (January 20, 2014)		
	BARWICK TS	25	1			
	BURLEIGH DS	-	-			
	CLEARWATER BAY DS	0.01	0.0004			
	DRYDEN TS	0.01	0.0004			
	ETON DS	0.01	0.0004			
	FORT FRANCES MTS	0.04	0.0016			
	FORT FRANCES TS	-	-			
	KEEWATIN DS	-	-			
	KENORA DS	-	-			
	KENORA MTS	0.045	0.0018			
	MARGACH DS	-	-			
	MINAKI DS	-	-			
	MOOSE LAKE TS	0.01	0.0004			
	NESTOR FALLS DS	-	-			
	SAM LAKE DS	0.02	0.0006			
	SAPAWE DS	-	-			
	SHABAQUA DS	-	-			
	SIOUX NARROWS DS	0.01	0.0004			
	VALORA DS	-	-			
VERMILLION BAY DS	-	-				
	TOTAL	25.1	1			
York	HOLLAND TS	3	1	2013 Peak (Summer)		
	ARMITAGE TS	10.3	3.5			
	BROWN HILL TS	31.1	10.6			
	BUTTONVILLE TS	1.3	0.4			
	MARKHAM 1 MTS	2.1	0.7			
	MARKHAM 2 MTS	6.2	4.7			
	MARKHAM 3 MTS	4.6	3.5			
	MARKHAM 4 MTS	0.4	0.2			
	RICHMOND HIL MTS	3.1	1			
	VAUGHAN 1 MTS	5.6	1.9			
	VAUGHAN 2 MTS	3	1			
	VAUGHAN 3 MTS	2.2	0.7			
		TOTAL	72.9		29.3	

Notes:

[*] No additional distributed generation has come into service in the North of Dryden subregion than was considered as part of the IRRP in section 4.2.

[**] These stations (Kanata MTS and Riverdale TS in the Ottawa subregion) have reduced MW of connected DG comparing to 2016 since the 2016 report had mistakenly included the DG that have been connected prior to 2012.

A.3 Other Initiatives

Other Electricity System Initiatives, as identified by the IESO, include:

Subregion	Other Electricity System Initiatives
Barrie/Innisfil	A local achievable potential study has been initiated for the Barrie/Innisfil sub-region.
Brant	The IESO, with input from the Brant area LDCs, initiated the development of the Brant Local Demand Response (DR) Pilot, seeking to secure up to approximately 15 MW of DR provided by local load customers that are supplied by the Brant TS and/or Powerline MTS for the summer of 2017 and the summer of 2018. A call for RFPs was put out in Q4 2016 for phase one of the pilot period commencing in summer 2017. The IESO did not receive any applications for the pilot and after feedback from various stakeholders on phase one of the pilot, the IESO has decided not to proceed with a second RFP round for the Brant DR Pilot.
Bronte	There are no updates to report at this time.
Central Toronto	A Local Achievable Potential study has been initiated for key transformer stations in downtown Toronto that are experiencing high growth rates and are close to their capacity limits. This study will assess the potential for using additional demand-side conservation and distributed energy options to defer system investment needs. The target stations for the initial study include: Terauley, Esplanade, Basin, and Carlaw. This study is being led by Toronto Hydro with funding support from the IESO.
Greenstone-Marathon	Members of the Town of Marathon Economic Development Corporation indicated to the IESO their interest in investigating a biomass cogeneration facility. This was supported, at a planning level, by the IRRP based on avoided costs, as the Town of Marathon currently does not have access to pipeline natural gas and relies on electric heating and other forms of relatively expensive fossil fuel-based heating (e.g. oil, propane, etc.).
Greater London	There are no updates to report at this time.
KWCG	The Region of Waterloo is currently working with local utilities to develop a regional community energy plan/strategy and has received funding under the Ministry of Energy's Municipal Energy Plan program. IESO has been working with the Region to coordinate planning activities.
North of Dryden	No additional electricity system initiatives have been undertaken in this sub-region at this time.
Northwest GTA	No additional electricity system initiatives have been undertaken in this sub-region at this time. Development work for the Halton Hills Hydro MTS is underway. Targeted in service date is 2018. Development work for the other recommended outcomes is not yet required, but actual conditions will continue to be monitored.
Ottawa	No additional electricity system initiatives have been undertaken in this sub-region at this time.
Pickering-Ajax-Whitby	IESO has been involved as a stakeholder to the Region in the Durham's Community Energy Planning process.
Parry Sound/Muskoka	A local achievable potential study will be initiated shortly to examine the cost and feasibility of implementing community-based energy solutions in this area.
Thunder Bay	There are no updates to report at this time.

Subregion	Other Electricity System Initiatives
Windsor-Essex	<p>Construction has begun on the SECTR project, with an expected in-service date of mid-2018. However, the decision on Phase 2 of its Leave to Construct proceeding is still outstanding. More information on the SECTR project and the regulatory proceeding may be found on the Board website under Board file number EB-2014-0421.</p> <p>The next round of regional planning for the Windsor-Essex region has begun and should be completed by mid-2019.</p> <p>In July 2017 the City of Windsor approved a Community Energy Plan.</p>
West of Thunder Bay	<p>Both the City of Kenora and the Municipality of Sioux Lookout are in the process of developing a Community Energy Plan. The IESO has been working with these communities to coordinate planning activities, where appropriate.</p>
York	<p>The local utilities, Alectra Utilities and New Market Tay Power, are engaging in a number of pilots, including Micro Grid project, storage and residential solar storage technologies.</p> <p>In 2016, Alectra Utilities and the IESO conducted a study to examine the feasibility of implementing residential solar-storage technology in Markham, Richmond Hill and Vaughan.</p> <p>Local achievable potential study will be initiated shortly to examine the cost and feasibility of implementing community-based energy solutions in Vaughan and Northern York Region.</p> <p>The municipalities of Markham, Vaughan and Newmarket have completed or in the process of developing Municipal Energy Plans, and the Chippewas of Georgina Island are also in the process of developing a Community Energy Plan.</p>

APPENDIX B. PLANNING STATUS LETTERS

The TSC requires that letters be issued by the transmitter as per Section 3C.2.2 item (h):

(h) within 45 days of receipt of a request to do so, provide a letter to a licensed distributor or a licensed transmitter confirming the status of regional planning for a region, including any Regional Infrastructure Plan that is being developed for the region that includes the distributor's licensed service area or within which the requesting transmitter's transmission system is located, suitable for the purpose of supporting an application proposed to be filed with the Board by the distributor or requesting transmitter.

In compliance with this requirement, Hydro One has provided Planning Status Letters to the following LDCs since October 2016:

- Erie Thames Power Lines Corporation
- Hydro One Distribution