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BY COURIER

November 1, 2016

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

Dear Ms. Walli,

**EB-2011-0043 – 2016 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 2016 Regional Planning Process Annual Status Report, pursuant to the above noted Code section.

Sincerely,

ORIGINAL SIGNED BY ODED HUBERT

Oded Hubert

Attach.



Regional Planning Process  
**Annual Status Report**  
2016

November 1<sup>st</sup>, 2016

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## EXECUTIVE SUMMARY

As part of the Transmission System Code<sup>[1]</sup> (“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 1<sup>st</sup> of each year, which identifies the status of the regional planning for their respective regions. This Report is the third 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 2015 and October 2016.

### Progress to Date

The first cycle of the regional planning process is currently underway and is following the process developed by the Planning Process Working Group (“PPWG”). This first cycle is expected to be completed by August 26, 2017.

Since the regional planning process was introduced, Hydro One, Local Distribution Companies (“LDCs”), and the Independent Electricity System Operator (“IESO”) have met mandatory timelines to complete each of the regional planning phases with the exception of the Northwest Ontario Integrated Regional Resource Plan (“IRRP”)<sup>1</sup>, which is further discussed below.

One of several major initiatives since the last report in 2015 is the development of several Regional Infrastructure Plans (“RIP”), which represent the lead transmitter’s final product in the regional planning process. From a wires infrastructure perspective, the RIP 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. The RIP is initiated as a final step in the regional planning process and provides a consolidated wires plan for a region at least over the next ten years.

Since the 2015 annual report, Hydro One has completed six RIP reports for Group 1 regions in the past year, namely Greater Ottawa, GTA North, GTA West, Kitchener-Waterloo-Cambridge-Guelph (“KWCG”), Metro Toronto, and Windsor-Essex Regions. Two remaining Group 1 RIP reports are still in development, which are Burlington to Nanticoke and GTA East, expected to be completed by the end of Q4 2016. The IESO, as the lead for IRRPs, has requested the Board for an extension beyond 18 months for Northwest Ontario (Thunder Bay Sub-region IRRP). This IRRP is expected to be completed by the end of Q4 2016 and the RIP is currently planned to be completed by August 26, 2017.

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<sup>1</sup> Northwest Ontario IRRP delay was indicated in the 2014 report to the OEB<sup>[2]</sup>.

In the past year, Hydro One has also completed two RIPs for Group 2 regions, namely Peterborough to Kingston, and Sudbury/Algoma regions. All required IRRPs for the Group 2 regions (i.e., London Area and South Georgian Bay/Muskoka) are underway. East Lake Superior region is being led by Great Lakes Power. For this region, the Working Group determined that no further regional coordination or IRRP is required. Further details and status will be provided by GLPT.

Since the 2015 annual report, regional planning was also initiated for Group 3 regions, and Hydro One has completed Needs Assessments (“NA”) for all six regions where Hydro One is the lead transmitter. No regional coordination, and therefore no IRRPs, has been identified for Group 3 regions. RIPs for two of the regions have already been completed. The remaining four Hydro One regions are undergoing Local Planning (“LP”) and RIPs are expected to be completed before August 26, 2017, of which one is underway. Five Nations Energy Inc. is the lead transmitter in North of Moosonee region and will provide the status update for the region.

Key accomplishments since the last report to the Board include:

- Timely completion of 10 RIPs;
- Timely completion of 4 IRRPs;
- Completion of 2 Local Planning (“LP”) reports;
- Timely completion of Needs Assessments (“NA”) for all group 3 regions where Hydro One is the lead transmitter.

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

**Table 1. Regional Planning Status Summary**

Group	Region	Sub-region	NA	SA	IRRP	RIP
1	Burlington to Nanticoke	Brant				
		Bronte				
		Greater Hamilton				
		Caledonia-Norfolk				
	Greater Ottawa	Ottawa				
		Outer Ottawa				
	GTA East	Oshawa-Clarington				
		Pickering-Ajax-Whitby				
	GTA North	York				
		Western				
	GTA West	Northwestern				
		Southern				
	Kitchener-Waterloo-Cambridge-Guelph (KWCG)					
	Metro Toronto	Central Downtown				
		Northern				
Northwest Ontario	North of Dryden					
	Greenstone-Marathon					
	Thunder Bay					
	West of Thunder Bay					
	Remote Communities**					
Windsor-Essex						
2	East Lake Superior*		Status to be provided by the lead transmitter			
	London Area	Greater London				
		Alymer-Tillsonburg				
		Strathroy				
		Woodstock				
		St. Thomas				
	Peterborough to Kingston					
South Georgian Bay/Muskoka	Barrie/Innisfil					
	Parry Sound/Muskoka					
Sudbury/Algoma						
3	North of Moosonee*		Status to be provided by the lead transmitter			
	Chatham/Lambton/Sarnia					
	Greater Bruce/Huron					
	Niagara					
	North/East of Sudbury					
	Renfrew					
	St. Lawrence					

Completed
  In Progress
  Not Required
  Not Started

\* Hydro One is not the lead transmitter in this region

\*\* Development of Remote Community Connection Plan was already underway prior to the new planning process led by the IESO

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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<sup>[1]</sup> (“TSC”) and the Distribution System Code<sup>[3]</sup> (“DSC”). This process is outlined in the Planning Process Working Group (“PPWG”) Report to the Board, titled “The Process for Regional Infrastructure Planning in Ontario”<sup>[4]</sup>, 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 1<sup>st</sup> of each year, which identifies the status of the regional planning process and its products in their respective regions. This third 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 2015 to October 2016. 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.
- Section 6 and 7 summarizes Hydro One’s observations on the regional planning process after its third year of implementation, and provides an outlook of activities that will take place over the next couple years.

## 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, and may not require the same magnitude of investments as bulk system planning.

The regional planning process begins with a Needs Assessment (“NA”) step of the process 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 Working Group 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, a local planning to undertake any necessary investments is planned directly by the LDCs (or customer) and the transmitter through a Local Planning (“LP”). The Working Group has recommended a LP process when needs are a) local in nature b) limited investments of wires (transmission or distribution) solutions c) does not require upstream transmission investments d) does not require plan level stakeholder engagement and e) other approvals such as Leave to Construct (S92) application or Environmental Approval.

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. If there are needs that do not required regional coordination, Working Group can recommend them to be undertaken as part of the LP approach discussed above. Else, the approach is either to develop a RIP, which is led by the transmitter, or an IRRP, which is led by the IESO.

The primary purpose in the IRRP phase is to identify both resource and wires options at a higher or more macro level, but sufficient to permit a comparison with resource options 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 considered as part of each step in the regional planning process.

If and when the 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 a lead transmitter undertakes to develop a RIP for the region and publishes a RIP report for the region. The RIP report 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. The methodologies used in the NA and RIP step are described further in Appendix A and B, respectively.

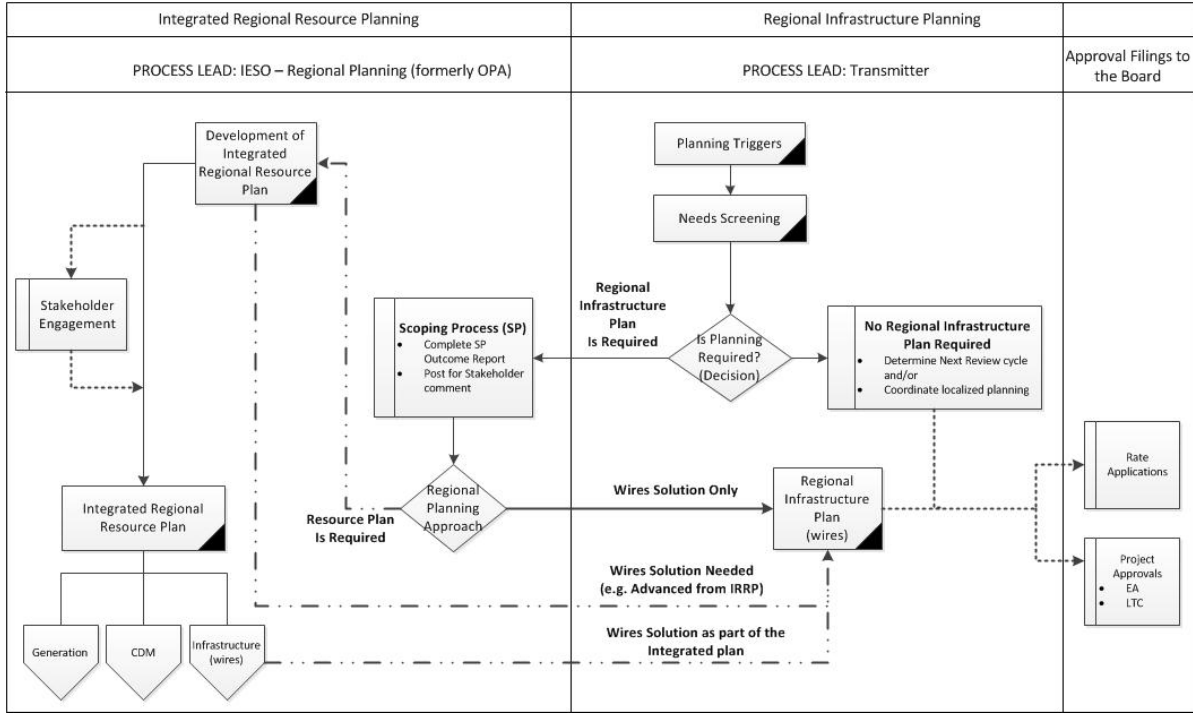


Figure 1. Regional Planning Process Flowchart

## 2.1 Regional Grouping

To manage and prioritize regional planning activities, the province was divided into 21 regions and assigned to 3 groups. Hydro One is the main 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 Working Group is established with representatives from the IESO, Hydro One, and LDCs. During the regional planning process, study team may subdivide a region into one or more sub-regions based on electrical characteristics, contiguity and needs for efficient and affective assessment. In some cases, no further regional coordination may be required for a sub-region. The planning regions are listed in Table 2 and shown geographically in Figure 2.

Table 2. Regional Grouping

Group 1
Burlington to Nanticoke
Greater Ottawa
GTA East
GTA North
GTA West
KWCG
Metro Toronto
Northwest Ontario
Windsor-Essex

Group 2
East Lake Superior
London Area
Peterborough to Kingston
South Georgian Bay/Muskoka
Sudbury/Algoma

Group 3
Chatham/Lambton/Sarnia
Greater Bruce/Huron
Niagara
North of Moosonee
North/East of Sudbury
Renfrew
St. Lawrence

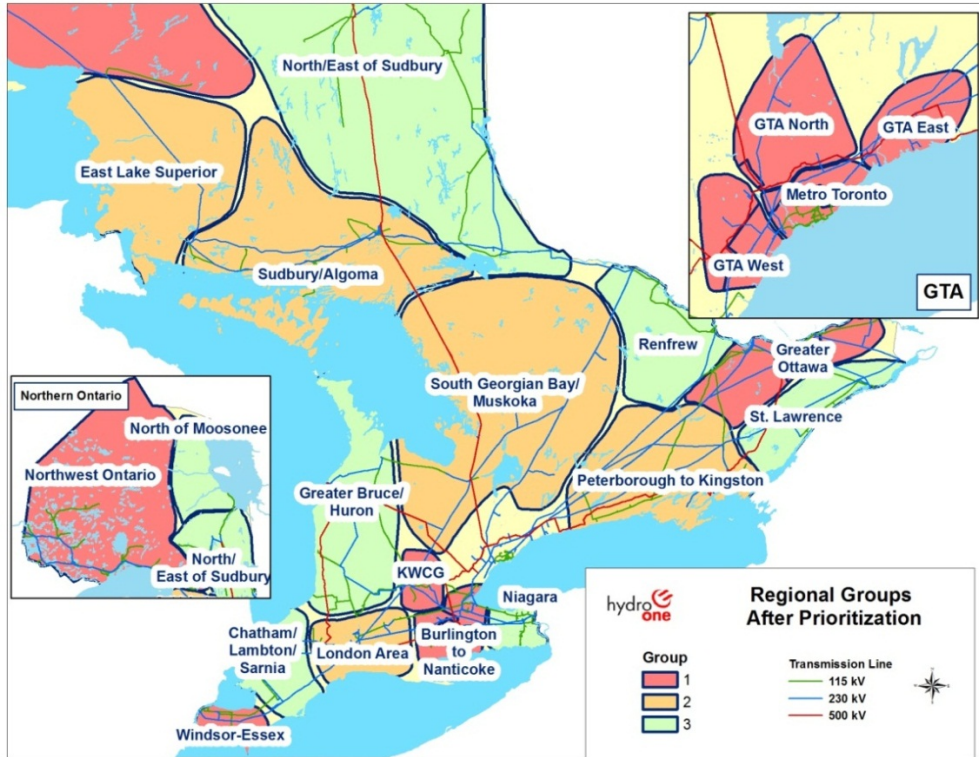


Figure 2. Regional Planning Regions

## 2.2 Conservation & Demand Management, and DG

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 area<sup>[5]</sup>. The CDM information was 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 has provided 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 C.

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 within the specific region. In addition, contracted DG plans have also been taken into account during planning assessment. Both, CDM and DG information was used to develop a net forecast from the gross load forecast provided by the LDCs.

### 3. STATUS OF GROUP 1 REGIONS

Groups of regions were prioritized based on the urgency and anticipated near-term and mid-term needs in the region or where regional planning activities were already underway prior to the TSC and DSC amendments were placed in Group 1. For regions where regional planning activity was already underway, Needs Assessment and/or Scoping Assessment phase were deemed to be complete and no reports were developed. The Working Group determined that these regions were already in the SA or IRRP phase of the process.

Group 1 regions primarily encompass areas where regional planning activities were already underway prior to the TSC and DSC amendments for the regional planning process in August 2013. Studies for these areas were transitioned to the appropriate step of the new process, and additional sub-regions were identified for areas either not covered previously or to appropriately subdivide a new region being assessed. These regions and/or sub-regions include:

- Central Toronto area (part of Metro Toronto Region)
- York area (part of GTA North Region)
- Northwest GTA area (part of GTA West Region)
- Ottawa area (part of Greater Ottawa Region)
- Brant area (part of Burlington to Nanticoke Region)
- KWCG Region
- Windsor-Essex Region
- North of Dryden (part of Northwest Ontario Region)
- GTA East Region was expedited at the request of the LDCs in the region and reprioritized from Group 2 to Group 1.

There were six RIPs completed for regions Greater Ottawa, GTA North, GTA West, Kitchener-Waterloo-Cambridge-Guelph (“KWCG”), Metro Toronto, and Windsor-Essex Regions. Two RIPs are still in development namely Burlington to Nanticoke and GTA East, forecasted to be completed by Q4 2016. The scope of the RIP includes: confirmation of needs and identification of any new needs that may have emerged since the beginning of the regional planning process for that region, and development of a consolidated wires plan to address needs where wires solution is determined as the most appropriate approach. In parallel, planning and development work for transmission or distribution projects that are required to address urgent or near-term needs are also being carried out by Hydro One and/or the affected LDCs.

For Northwest Ontario, which is broken down into five sub regions, IRRP for North of Dryden, West of Thunder Bay, and Greenstone-Marathon is completed, while IRRP for Thunder Bay is in progress, expected to be completed by Q4 2016.

## 3.1 Burlington to Nanticoke

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

The RIP for Burlington to Nanticoke Region is currently underway and is expected to be completed by the end of Q4 2016. The status of regional planning of each sub-region is discussed in more details 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. Planning for Brant Sub-region was already underway prior to the new regional planning process and was deemed to be in the IRRP phase. The Brant IRRP was completed in April 2015.

The Brant IRRP identified that there is an immediate need for additional transmission supply capacity in the Brant-Powerline 115kV subsystem. In 2014, a wires plan was developed to install capacitor banks at Powerline MTS to provide some capacity relief and they were placed in-service in August 2015. Additionally, based on the LDCs load forecast, an immediate need was identified to provide additional 115kV line capacity in the sub-region. Options and a resulting wires plan were developed by Hydro One as part of the Brant IRRP Working Group. The preferred option requires the installation of three 115kV in-line breakers to connect existing circuits B12/B13 from Burlington to B8W from Woodstock. Project is moving forward and is expected to be completed in Q1 2019.

### 3.1.2 Bronte Sub-region

Bronte Sub-region includes the area served by Bronte TS, supplied by 115kV circuits B7/B8 from 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.

As per the SA recommendations, Bronte IRRP was carried out, and completed in June 2016. Capacity needs at Bronte TS were identified and assessed. The Working Group recommended load transfers to neighboring Tremaine TS which has spare capacity to address this issue.

For the system restoration issue at Burlington TS, for the simultaneous loss of two autotransformers, a new additional 230kV breaker has been added to comply with the ORTAC restoration criteria.

### 3.1.3 Greater Hamilton Sub-region

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 LDC(s) through LP. The final consolidated LP report was completed in October 2015.

- **Dundas TS T1/T2 and T5/T6 Station Capacity**

The Dundas TS T1/T2 DESN (formerly T3/T4 DESN) was earlier loaded beyond its supply capacity. The load at this DESN has dropped significantly and is now within its supply capacity. The current load forecast does not show any overloading in the foreseeable future at any DESN inside Dundas TS. No action is required.

- **Mohawk TS Station Capacity**

The load at Mohawk TS marginally exceeds normal supply capacity. The Mohawk TS T1/T2 transformers are approaching end of life and are already scheduled for replacement in 2019 with larger capacity transformers, which will address this issue.

- **Nebo TS T3/T4 Station Capacity**

One of the two (T3/T4) DESN at Nebo TS supplying loads at 13.8 kV is currently loaded close to its supply capacity and in the past had marginally exceeded its supply capacity. The load at the Nebo TS (T3/T4) transformers is currently forecasted to remain marginally below its supply capacity in the foreseeable future. No action is envisaged at this time.

- **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 Working Group recommended that Burlington Hydro install capacitor banks on distribution system and/or work with their load customers supplied by Cumberland TS to meet the power factor requirement of 0.9.

- **Power Factor at Kenilworth TS**

The power factor at Kenilworth TS is lagging below the requirement of 0.9. The Working Group recommended that Horizon Utilities install capacitor bank on distribution system and/or work with load customers supplied by Kenilworth TS to meet the power factor requirement of 0.9.

- **Power Factor at Beach TS (115 kV T3/T4 DESN)**

The power factor at Beach TS is leading beyond the requirement of 0.9. The Working Group reviewed this requirement and recommended that this can be managed by operational measures and no further action is required at this time.

- **System Reliability, Operation and Load Restoration**

In some cases, double circuit lines in the region carry loads in excess of the 150MW and 250MW restoration thresholds. Provincial reliability requirements for load curtailment at

these threshold levels are subject to shorter restoration times than the standard eight hours for smaller loads. The Working Group recommended that no action is required at this time based on the historical reliability data for the circuits in the region.

### 3.1.4 Caledonia-Norfolk Sub-region

This sub-region includes the Haldimand and Norfolk County, and covers the southern part of Burlington to Nanticoke Region. Local needs in this sub-region are being addressed directly by Hydro One Distribution through the LP report completed in October 2015. Under peak load conditions and single contingency, there may be low voltage issues at Norfolk TS and Bloomsburg MTS. The coincident load at Norfolk TS and Bloomsburg TS can be managed by load transfers and kept below the area supply limit of 87MW. The Working Group recommended that Hydro One Distribution undertake distribution loads transfers to neighboring stations.

## 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 Greater Ottawa Region was completed in December 2015 which includes two recommendations: B5D/D5A Load Restoration, completed in September 2015, and Supply to East Ottawa Area, completed in November 2015. A review of the loading on the transmission lines and stations in the region was also carried out as part of the RIP report with the following conclusions:

- M30A/M31A will require reinforcement by 2020 based on current forecast. Hydro One will address this issue based on recommendation from IESO Bulk System Planning study
- Hawthorne-to-Moulton section on A4K to be upgraded by 2024.

The recommendations of the RIP report are provided in more details below.

### 3.2.1 Ottawa Area Sub-region

Ottawa Area Sub-region covers the central part of the Greater Ottawa Region and includes the City of Ottawa and the surrounding municipalities. Planning for Ottawa Area Sub-region was already underway prior to the new regional planning process and was deemed to be in the IRRP phase. The Ottawa Area IRRP was completed in April 2015.

The Ottawa Area IRRP identified the need for additional 230/115kV auto-transformation capacity at Merivale TS and provision for a supply for a new station in the southwest area. The options to



address these needs are still being studied by the Working Group and discussed by the IESO at their plan level community engagement activities. This is part of the IESO led Bulk System Planning.

As per RIP report, the status of recommended plans is as follows:

- **Russell TS and Riverdale TS**

The loading on these stations will be kept within limits by Hydro Ottawa building feeder ties to transfer excess loads to other area stations. This will keep the loading on the transformers at these stations within their rating. Hydro Ottawa will take the lead responsibility for this project.

- **Overbrook TS**

Step-down transformers at Overbrook TS were approaching end-of-life and consideration was therefore given to upgrading the transformers at the station. Accordingly, Overbrook TS transformers are being replaced with larger sized units which will increase the station capacity from 72MW to 130MW. The work is underway by Hydro One and planned to be completed in Q2 2018.

- **Hawthorne TS**

Hydro One identified that the step-down transformers at Hawthorne TS (T7 and T8) were approaching end-of-life and needed to be replaced. To provide this additional capacity, Hydro One took advantage of the transformer replacement work and install larger 75/125 MVA transformers with an LTR of 153MW. This work is currently underway by Hydro One and planned to be completed by summer 2019. Additional 44kV feeder positions will be required to utilize this increased capacity. These feeders will be added as required.

- **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 cable, a higher capacity of up to 130MW can be achieved at King Edward TS. This work is pending a final decision and request from Hydro Ottawa.

Several of the Greater Ottawa regional needs have already moved from the planning to execution phase. They are described below with the expected in-service date provided in brackets.

- **Hawthorne TS Capacity:** Addressed by replacing two of the older autotransformers with larger capacity units (Q2 2018).
- **A4K Capacity:** Relieve the loading of circuit A4K by providing an additional supply to Overbrook TS from a tap to circuit A6R (Q2 2019).
- **S7M Capacity:** Mitigated by addressing localized line to ground clearances issues thus increasing the circuit capacity (completed in Q2 2015).

### **3.2.2 Outer Ottawa Sub-region**

Outer Ottawa Sub-region includes the eastern and western parts of 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 115kV circuit 79M1. The western part is located to the West of Kanata.

As per RIP report, the mid-term need for voltage regulation on 115kV circuit 79M1 will be reassessed in the next regional planning cycle.

## **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 is currently underway and expected to be completed by the end of Q4 2016. The needs in Oshawa-Clarington Sub-region are local in nature and could be effectively addressed by wires only solution.

### **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.

The IRRP for Pickering-Ajax-Whitby Sub-region was completed in June 2016. The Working Group recommended building a new DESN station in Seaton at 230/27.6kV in 2018. The EA process is currently underway and in service date will be confirmed thereafter. Load restoration issues identified in the IRRP will be addressed in the RIP report due for completion in Q4 2016.

### **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 Working Group recommended building a new transformer station at the Clarington TS site. This is currently planned to be in-service in 2018/19 subject to a connection request from the LDCs.

In addition, to address the issue of feeder capability utilization at Thornton TS, the Working Group recommended that Oshawa PUC Networks and Whitby Hydro Electric to carry out a distribution planning assessment and develop an implementation plan to manage and optimize utilization of feeder capability at Thornton TS.

## 3.4 GTA North

The GTA North Region is approximately bounded by the Regional Municipality of York, and also includes parts of the City 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.

### 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.

Planning for the York Sub-region was already underway prior to the new regional planning process and was deemed to be in the IRRP phase. An IRRP for the York Sub-region was completed in April 2015.

Status of several near term needs and the preferred wires approach to meet those needs were identified in the York IRRP. Further planning and recommendations discussed in RIP are as follows:

- To provide additional transformation supply capability and meet near-term demand growth in Vaughan, a new transformer station, Vaughan MTS #4, is under development by PowerStream. The station will connect to the 230kV transmission lines B82V/B83V. The project is expected to be completed in Q2 2017.
- Hydro One is building switching facilities at Holland TS to meet load security and restoration needs in the Northern York area, specifically in the areas supplied by 230kV transmission circuits B82V/B83V. This project is expected to be completed in Q4 2017.
- Load security and restoration needs were identified in the Southern York area for the loss of double 230kV 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 expected to be completed in 2018.

A need for additional transmission capacity reinforcement is identified in the medium- and long-term in Markham, Vaughan, and Northern York areas. Due to the medium and long-term nature of these needs, further planning studies are ongoing and the findings will be incorporated in the next regional planning cycle expected to be started in Q4 2017.

### **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.

The NA for the Western Sub-region identified a potential load restoration issue for the loss of 230kV circuits V43 and V44. No capacity needs were identified based on the LDC load forecast over the near and medium-term.

The Working Group recommended that the potential load restoration issue be assessed as part of the IESO led Bulk System Planning study. IESO is assessing this in conjunction with the restoration needs stemming from GTA West Northwestern Sub-region IRRP. Bulk System Planning is outside the scope of regional planning. However the Working Group will be provided an update on the outcomes to ensure coordination. Findings of this study will be incorporated in the RIP report for the region.

## **3.5 GTA West**

The GTA West Region covers the Regional Municipalities of Halton and Peel, and comprises 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.

The RIP for this region was completed in January 2016.

### **3.5.1 Northwestern Sub-region**

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

Planning for Northwestern Sub-region was already underway prior to new regional planning process and was deemed to be in the IRRP phase. An IRRP for the Northwestern Sub-region was completed in April 2015.

The GTA West RIP identified the following:

- There is a near-term need for additional station capacity at Halton TS which supplies Halton Hills Hydro and Milton Hydro. The recommendations from the RIP process are to build two new step-down stations: one to provide supply for Halton Hills Hydro loads (Halton Hills Hydro MTS), expected to be in-service in 2018 at the earliest which will be carried out by LDC; and second to supply Milton Hydro load (Halton TS #2), expected to be required in 2020 which will be carried out by Hydro One.
- A medium-term need for additional supply capacity to Pleasant TS. There are 3 DESNs at Pleasant TS supplied by 230kV circuits H29/H30 circuits. Due to load growth forecasted at Pleasant TS, these circuits are expected to reach their thermal capacity by 2023 at the earliest. On the recommendation of the RIP Working Group, Hydro One will monitor growth and reassess this issue during the next regional planning cycle.
- The thermal capacity of T38B/T39B may be exceeded with a single-circuit contingency and Halton Hills GS out of service in the medium-term. The RIP Working Group recommends that the bulk power system study led by IESO account for this supply security issue on their planning process.
- A new electricity corridor maybe required in the Northwestern sub-region for additional transmission facilities required to meet the long-term need in the area. The RIP Working Group recommended further assessments to be carried out and complete technical details, conceptual layout of high voltage electricity infrastructure by Q1 2017.

### 3.5.2 Southern Sub-region

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

For the Southern sub-region, the Working Group determined that the needs identified for this sub-region can be addressed directly by the transmitter and LDCs through LP. These needs are summarized in RIP.

The GTA West RIP identified the following:

- The peak load at Erindale TS T1/T2 (230/27.6kV) currently exceeds the normal supply capacity of the station. The RIP report recommends that Enersource Hydro Mississauga Inc. build a new 44/27.6kV distribution station to utilize extra capacity on the 44kV system. LDC will carry out the work with an in-service date of 2018-2019.
- Loading on Richview TS to Trafalgar TS 230kV circuits exceeded their summer long-term emergency ratings in the near-term following a single contingency. These issues are further assessed as part of the IESO led bulk system planning study along with some restoration

issues in the sub-region. Bulk system planning is outside the scope of regional planning, however, the Working Group will be provided an update on the outcome of the study to ensure coordination.

### **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.

Planning for the KWCG Region was already underway prior to the new regional planning process and was deemed to be in the IRRP phase. The IRRP for the region was completed in April 2015. The RIP was completed in December 2015.

In parallel, two transmission projects are being developed by Hydro One to address near-term supply:

- The Guelph Area Transmission Refurbishment Project (GATR) has been approved by the OEB and is expected to be in-service in Q4 2016. Per the OEB's Section 92 Conditions of Approval, Hydro One will notify the OEB once construction is complete.
- The development work for the switching facilities at Galt Junction to improve reliability in the Cambridge and Kitchener areas is also underway with the planned in-service date May 2017.

These near-term actions will address electricity needs in the area over the next 10 years.

Two other projects undertaken by LDCs are:

- Guelph Hydro to mitigate short circuit levels at Arlen MTS. Work completed May 2016.
- Waterloo North Hydro to monitor growth on Waterloo North Hydro MTS#4.

### **3.7 Metro Toronto**

The Metro Toronto Region comprises the municipality of Toronto. 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.

RIP for this region was completed in January 2016.

#### **3.7.1 Central Downtown 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 within 0.5 km of Highway 401, westward to the Humber River, and eastward to Victoria Park Avenue.

Planning for the Central Downtown Sub-region was already underway prior to the new regional planning process and was deemed to be in the IRRP phase. An IRRP for the Central Downtown Sub-region was completed in April 2015.

Over the last decade, a number of transmission/distribution projects have been underway or completed to address supply capability, reliability, and equipment end-of-life issues in the Central Downtown Sub-region, such as: the new underground cables connecting John TS to Esplanade TS; Midtown 115kV transmission reinforcement between Leaside and Bridgman TS; rebuilding Hearn SS for the incorporation of 550MW Portlands Energy Centre; 115kV breaker upgrades at Leaside TS and Manby TS; underground cable refurbishment between Riverside Junction and Strachan TS; and a new 115kV switching station to connect the new customer transformer station (Clare R. Copeland MTS) in downtown Toronto expected to be in-service in Q3 2018.

Currently, a wires only approach has been identified in the sub-region to be a preferred solution to address near- and medium- term needs after taking into account the CDM and DG considerations.

- To mitigate the identified needs, station and distribution feeder expansion/load transfer at Runnymede TS and Horner TS are recommended to provide capacity relief at Runnymede TS and Fairbank TS, as well as to Manby TS and Horner TS.
- Richview to Manby Transmission Reinforcement will be required around 2020. Options are being investigated for upgrading the existing lines or building new circuits. Findings of this study will be an input in the next planning cycle.
- Manby x Wiltshire Corridor upgrade will be required same time as Runnymede expansion.
- A potential need for capacity relief to Esplanade TS and Copeland MTS in the downtown core area is anticipated as early as 2021. A plan for Copeland MTS phase 2, which involves the installation of additional transformers at the existing Copeland MTS site, is being further assessed by Toronto Hydro. Findings of this study will be an input in the next planning cycle.
- 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. It is expected to be in service by 2018.

### **3.7.2 Northern Sub-region**

The Metro 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 Metro Toronto Northern Sub-region had identified that C10A line capacity was restricted due to inadequate clearance from underbuilt street lighting and distribution line. Field surveys carried out by Hydro One have confirmed that the limiting underbuilds have been removed and restrictions eliminated.

## **3.8 Northwest Ontario**

The Northwest 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 five sub-regions for the purpose of regional planning.

Hydro One will initiate the regional RIP after the completion of the last sub-regional IRRP in Q4 2016 and RIP is expected to be completed by August 26, 2017.

### **3.8.1 North of Dryden Sub-region**

This includes the portion of the Northwest 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 sub-region and has the potential for supplying the future Ring of Fire mining load.

Planning for North of Dryden Sub-region started prior to the new regional planning process. The IESO has issued the IRRP report in January 2015. The report has 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. Currently, there are two transmission infrastructure investments being further planned and 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
- 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)

Two proponents have expressed interest in developing and constructing the proposed transmission line from Dryden/Ignace area to Pickle Lake. Hydro One's role in this initiative is that of the



Connecting Transmitter and will follow the connection requirements as per the TSC and Transmission Connection Process.

For the second need, customers seeking additional transmission capacity have requested estimates to upgrade the 115kV line. Hydro One is planning and undertaken engineering design to upgrade transmission line E4D and install capacitor banks at Red Lake and develop an estimate for the customers.

### **3.8.2 Greenstone-Marathon Sub-region**

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

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

To meet the forecast demand from LDCs, no new system enhancements are required. Accordingly, new industrial and/or mining loads will be monitored and investments will be initiated once the formal connection request is made by the customer(s).

If new mining loads materialize, IRRP recommends to install +40 MVar of reactive compensation in the form of either a synchronous condenser or STATCOM at the Geraldton mine, to be in-service coincident with the mine, plus a customer-based grid-connected gas-fired generation plant of sufficient redundancy to meet the risk tolerance of the Geraldton mine.

In addition to the mining loads, if the gas to oil pipeline conversion process proceeds, IRRP recommends to install a new 230kV single-circuit line from the East-West Tie near Nipigon or Marathon to Longlac, new 230/115 kV auto-transformer and related switching and voltage control facilities at Longlac TS along with a new 115kV single-circuit line from Longlac TS to Manitouwadge TS and related switching and voltage control facilities.

In the short-term, the course of action to undertake any investments will depend on the plans and decisions of the mine and pipeline proponents.

### **3.8.3 Thunder Bay Sub-region**

This 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 IRRP for Thunder Bay is in progress and expected to be completed by the end of Q4 2016.

### **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, 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 IRRP for West of Thunder Bay was completed in July 2016. This IRRP recommended monitoring electricity demand growth closely to determine if and when a decision on Dryden 115kV subsystem is required. Working group will also ensure communities are informed of bulk and distribution planning and coordinate regional and community energy planning activities.

### **3.8.5 Remote Communities Sub-region**

There are 27 remote First Nations communities in Northwest Ontario with electricity supply, 25 of which are currently not connected to the provincial electricity grid and use local diesel generators for electricity. These remote First Nations communities (“remote communities”) are considered remote because of their distance from established transportation and/or energy infrastructure, with most relying on winter roads to transport goods and supplies.

Planning for remote communities led by the IESO was already underway before the new regional planning process was introduced. The planning report for remote communities is referred to as Remote Community Connection Plan. The Remote Community Connection Plan is currently in draft form as community engagement has not yet been finalized. Once this plan is complete, Hydro One will incorporate its findings and recommendations related to infrastructure planning within the RIP for the Northwest Region.

## **3.9 Windsor-Essex**

The Windsor-Essex Region is 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.

Planning for Windsor-Essex Region was already underway prior to new regional planning process and was deemed to be in the IRRP phase. The IRRP for the region was completed in April 2015 and the subsequent RIP was completed in December 2015.

During the regional planning process, the following needs to be addressed by wires solution in the region were identified:

- Supply Interruptions in the J3E-J4E Subsystem;
- Additional Supply Capacity requirement in the Kingsville-Leamington Area.

The above needs will be addressed by the new Supply to Essex County Transmission Reinforcement (“SECTR”) project as an integrated solution for both needs. The SECTR project consists of:

- Installation of a new 230/27.6 kV transformer station in the Municipality of Leamington;
- Construction of a 13 km double-circuit 230 kV line to connect the existing C21J/C22J circuits to the new transformer station.

Sufficient load is also planned to be transferred to the new TS from Kingsville TS to provide relief to the station. The estimated completion date for the SECTR project is Q2 2018. Hydro One received a “Leave to Construct” approval for the SECTR project from the OEB on July 16, 2015.

## 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 the Group 1 regions. This expectation was supported by the Group 2 NAs. Group 2 consists of the following regions:

- East Lake Superior (Led by Great Lakes Power)
- London Area
- Peterborough to Kingston
- South Georgian Bay/Muskoka
- Sudbury/Algoma

The NA for all Group 2 Regions is now complete. The SA for London Area and South Georgian Bay/Muskoka Regions is also complete and the IRRP phase is currently underway for both of these regions. These IRRPs are expected to be completed by the end of Q4 2016.

### 4.1 East Lake Superior

This region is supplied by Great Lakes Power (GLP) Transmission and is wholly owned by Brookfield Infrastructure Partners. The region supplies two distribution companies namely Sault Ste. Marie PUC and Algoma Power Inc. The regional transmission system connects with provincial grid at Wawa TS and Mississagi TS, north of Thessalon. The GLP Transmission Company owns 560 kilometers of 230 kV, 115 kV and 44 kV transmission lines. Regional Planning for the East Lake Superior Region is being led by Great Lakes Power.

The NA for the region concluded that no further assessment is required. The Annual Status Report for this region falls within the accountability of Great Lakes Power which is the lead transmitter for this region.

### 4.2 London Area

The London Area includes the municipalities of Oxford County, City of Woodstock, Middlesex County, City of London, Elgin County, and City of St. Thomas.

The NA and SA for the London Area Region were completed in April 2015, and August 2015, respectively. Based on the SA results, the London Area Region was divided into five sub-regions based on electrical supply boundaries for further regional planning purposes:

- **Greater London 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.
- **Aylmer-Tillsonburg Sub-region:** Includes customers of Erie Thames Powerlines, Tillsonburg Hydro, and Hydro One Distribution, supplied by Aylmer TS and Tillsonburg TS.
- **Strathroy Sub-region:** Includes customers of Entegrus and Hydro One Distribution, supplied by Strathroy TS.
- **Woodstock Sub-region:** Includes customers of Woodstock Hydro and Hydro One Distribution, supplied by Ingersoll TS, Woodstock TS, Commerce Way TS, and Karn TS.
- **St. Thomas Sub-region:** Includes customers of St. Thomas Energy Inc., London Hydro, and Hydro One Distribution, supplied by Edgeware TS and St. Thomas TS.

Capacity and load restoration needs were identified in the Greater London Sub-region and an IRRP is currently underway expected to be completed in Q4 2016. Supply capability limitations were identified in Aylmer-Tillsonburg Sub-region. Hydro One has initiated a wires planning study to address these needs. LP process is also underway involving the affected LDCs to address needs in the Strathroy Sub-region and Woodstock Sub-region. Recommendations from this study will ultimately become part of the regional RIP report. There were no needs identified in the St. Thomas Sub-region and no further planning is required at this time. Any new needs identified will be further assessed and included in the RIP report for the region.

### 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 needs identified in the NA for the region, completed in February 2015, determined no further coordinated regional planning is required. The LP identified in the NA (Gardiner TS Load Balancing) was published in October 2015.

There were no other needs or further regional coordination required. Accordingly, the Working Group has developed and Hydro One published a RIP in July 2016 that is based upon and includes the NA and LP report to form the RIP report.

IESO will assess and develop a plan for the contingencies associated with the 115kV circuit Q6S and 230kV circuit P15C as part of its bulk system planning study for the area. Bulk system planning is

outside the scope of regional planning, however the Working Group will be provided an update on the outcomes to ensure coordination.

#### 4.4 South Georgian Bay/Muskoka

The geographical area of the South Georgian Bay/Muskoka Region is the area roughly bordered by West Nipissing 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 NA carried out for this region identified several needs that require regional coordination, and concluded that these needs should be reviewed further under the SA. As a result of the SA completed in June 2015 the region was divided into two sub-regions as follows:

- **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.
- **Parrie 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.

As a result, the IRRPs are currently underway for each of the sub-regions. Both IRRPs are expected to be completed in Q4 2016. Additional local wires needs identified in the NA will be addressed by Hydro One and the impacted LDCs as addressed in LP report published in May 2016. In addition, needs related to the bulk system for this region will be addressed as part of the IESO's bulk system planning study in parallel with the IRRP phase. Bulk system planning is outside the scope of regional planning. However, the Working Group will be provided an update on the outcomes to ensure coordination.

The LP report addresses the replacement of non-standard end-of-life equipment at Orangeville TS with standard equipment, and reconfiguration of Orangeville DESN.

The Barrie/Innisfil Sub-region is forecasted to experience significant growth and the assessment determined the following needs:

- Barrie TS reaching station capacity;
- Barrie TS transformers and infrastructure nearing end-of-life;
- E3B/E4B circuits reaching thermal loading capacity; and
- 230/115kV auto-transformer T1 at Essa TS nearing end-of-life.

Since Barrie TS is nearing end-of-life and reaching its maximum capacity, Hydro One is working with IESO, PowerStream, InnPower, and Hydro One Distribution to develop a plan to replace the aging infrastructure while also addressing the growth related needs. The plan entails:

- Upgrading 115kV lines E3/4B to 230kV
- Upgrade existing DESN transformer from 115/44 kV, 55/92 MVA to 230/44 kV, 75/125 MVA
- Adding additional feeders to Barrie DESN

## **4.5 Sudbury/Algoma**

The Sudbury/Algoma Region includes the municipalities of Greater Sudbury and Espanola 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.

The NA has determined that there are no capacity issues. System reliability and operating needs in this region are local in nature and an LP report was completed in September 2015 to address voltage concerns at Manitoulin TS. The report concluded that no infrastructure investments are required within this regional planning cycle. The WG also determined that no further regional coordination was required. Accordingly, Hydro One has developed and published a RIP report in June 2016 that is based upon and includes the NA and LP report.

## 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 NA for all Group 3 Regions initiated by Hydro One is 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 area 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 township of Petrolia, Plympton-Wyoming, Brooke-Alvinston, Dawn-Euphemia, Enniskillen, St. Clair, Warwick and Village of Oil Springs and Point Edward.

Based on the findings of the NA completed June 2016, the Working Group agrees that SA is not required at this time, since there is adequate regional supply capacity to accommodate expected load growth. Hydro One and relevant distributors will develop a LP to address the Kent TS – T3 Capacity limitation requirement.

### 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. The NA, completed in May 2016, recommended for further LP to address poor power factor issues and thermal capacity issues on circuit L7S. LPs are expected to be completed by Q4 2016. The WG also determined that no further regional coordination was required. Accordingly, Hydro One will develop and publish a RIP in Q1 2017 that is based upon and includes the NA and LP report.



### **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.

Regional Planning for the Niagara Region started with the Information Gathering in November 2015 and the NA report was completed in April 2016.

The Working Group recommended an LP approach to address the loading of Q4N which is expected to be completed in Q4 2016. The Working Group also determined that no further regional coordination was required. Accordingly, Hydro One will develop and publish a RIP in Q1 2017 that is based upon and includes the NA and LP report.

### **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.

Regional Planning for the North/East of Sudbury Region started with the Information Gathering in October 2015 and the NA report was completed in April 2016.

Based on the findings of the NA, the Working Group recommends that no further assessment is required. The two voltage regulations needs identified are assessed in the LP report. LP is expected to be completed by Q4 2016. The Working Group also determined that no further regional coordination was required. Accordingly, Hydro One will develop and publish a RIP in Q1 2017 that is based upon and includes the NA and LP report.

### **5.5 Renfrew**

The Renfrew Region includes all of Renfrew County.

Regional Planning for the Renfrew Region started with the Information Gathering in October 2015 and the NA report was completed in March 2016.

The Working Group determined that there were no needs in the region and no further regional coordination was required. Accordingly, Hydro One developed and published a RIP report in July 2016 that is based upon and includes the NA.

## 5.6 St. Lawrence

The St Lawrence Region covers the southeastern part of Ontario bordering the St Lawrence River. The region starts at the Gananoque on the eastern end of Lake Ontario and extends to the inter-provincial boundary with Quebec.

The western part of the region is supplied from Hydro One owned stations connected to the 230kV network. The remainder of the region is supplied from Hydro One stations connected to the 115kV network.

The City of Cornwall is supplied by Fortis Ontario with transmission lines from Quebec and is not included in this Region.

Regional Planning for the St. Lawrence Region started with the Information Gathering in December 2015 and the NA report was completed in April 2016.

The Working Group determined that there were no needs over the next 5 years in the region and no further regional coordination was required. Accordingly, Hydro One developed and published a RIP report in July 2016 that is based upon and includes the NA.

## 6. LDC SURVEYS

Since the last report Hydro One, working with the LDCs, completed the first set of RIP reports in several regions and NA reports for the remaining Group 2 and 3 regions. In an on-going effort to ensure that the Regional Planning process can be enhanced and also meets the objectives that were laid out in the PPWG report, Hydro One conducted two surveys in 2016 to seek the views of the LDCs. The surveys were limited to the LDCs who participated in the NA<sup>2</sup> and RIP phases of the regional planning process.

The LDCs survey questions covered the following broad areas:

- 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.

### Group 1 – RIP Survey

The RIP survey was conducted in Q2 of 2016 shortly after this phase was completed for the following regions:

- Greater Ottawa
- Kitchener/Waterloo/Cambridge/Guelph
- GTA North
- GTA West
- Metro Toronto
- Windsor-Essex

All 24 LDCs which participated in the RIP phase were invited to participate in the survey. 17 of the LDCs representative responded to the survey.

### Group 2 & 3 – NA Survey

The NA survey was conducted in the Q3 of 2016 shortly after NA phase was completed for Groups 2 and 3 regions.

All 31 LDCs which participated in the Group 2 and 3 NA phase were invited to participate in the survey. 19 of the LDCs representative responded to the survey.

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<sup>2</sup> The survey for NAs completed for Group 1 was reported in the 2014 Annual Status Report

## **Survey Conclusions and Next Steps**

In general, the surveys indicated that there is a consensus among the LDCs which participated in the Hydro One led RIP and NA phases of the Regional Planning that the process was:

- Understood,
- Timely,
- Transparent, and
- Aligned with LDCs requirements.

Couple of the comments implied improvements were needed where there is duplication of efforts or information exchange/confirmation during different phases of the regional planning process. Hydro One plans to follow up with LDCs that provided comments with a response to their identified areas of concern. In addition, all LDCs will be provided a summary of survey results.

Further details of both RIP and NA survey are discussed in Appendix D.

## 7. CONCLUSION AND NEXT STEPS

The first regional planning cycle underway is expected to be completed by August 26, 2017. It is following the process developed by the Process Planning Working Group (“PPWG”) that the Board established. Members from the IESO, LDCs and Hydro One transmission are represented on Working Groups 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 Working Group to address local type of needs where straight forward wires only options are the obvious choice. These needs do not require regional coordination and are addressed by the transmitter and affected LDC(s) (or customer). Other needs were further assessed by the Working Group during the IRRP and RIP phases of the regional planning process. Frequently, ‘wires’ planning is initiated in parallel with IRRP when the Working Group determines that a wires approach is the best alternative to address a need.

The sharing of information by the Working Group 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 to the Board include:

- Timely completion of 10 RIPs;
- Timely completion of 4 IRRPs;
- Completion of 2 LP reports;
- Timely completion of NA for Group 3 regions where Hydro One is the lead transmitter.

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 will develop and provide 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.

RIPs for six regions in Group 1, namely Greater Ottawa, GTA North, GTA West, KWCG, Metro Toronto, and Windsor-Essex, are completed. The RIP reports for two Group 1 regions (i.e., Burlington to Nanticoke, GTA East) are underway and will be completed by the end of Q4 2016.

Currently there are three sub-regions IRRPs in Group 2 that are underway (i.e., Greater London, Barrie/Innisfil, and Parrie Sound/Muskoka Sub-regions), which are expected to be completed by

the end of Q4 2016. Although subject to the completion of IRRP reports, it is anticipated that RIPS for these regions will be completed on or before August 26, 2017. Two other Group 2 RIPS have been completed due to the fact that the needs identified in the regions could be addressed by a LP process. NA and LP reports were deemed to form the "RIP" report for these regions.

The regional planning process for Group 3 regions were triggered, beginning with the NA in Q4 2015. As per the timelines in the TSC, the NAs for group 3 region have been completed.

### **Next Steps**

Two of the three remaining RIPS for Group 1 regions (i.e., Burlington to Nanticoke and GTA East) will be completed by the end of Q4 2016. The IRRP for Northwest Ontario – Thunder Bay Sub-region is in progress and expected to be completed by the end of Q4 2016. The Northwest Ontario RIP report is expected to be completed on or before August 26, 2017.

For Group 2 regions, it is expected that the remaining two RIP reports will be completed on or before August 26, 2017.

There are seven regions in Group 3. Hydro One is not the lead transmitter for the North of Moosonee Region. RIPS for two regions have been completed while the four remaining Hydro One regions are undergoing LPs. It is expected that the RIPS for all four regions will be completed before the end of Q2 2017.

## 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, 2014.
- [3] Ontario Energy Board. "Distribution System Code". Last Revised December 21, 2015 (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. NEEDS ASSESSMENT DATA AND METHODOLOGY

NA has two distinct phases, namely:

- Data Collection, and
- Study.

### A.1 Needs Assessment – Data Collection Phase

This phase collects the initial data and information for the regional planning process and also establishes the Working Group and the communication protocols. The key activities and the appropriate timelines of each of activity are illustrated in table below.

**Table 3. Data Collection Phase**

<b>Key Activity</b>	<b>Description</b>	<b>Typical Timelines from Kickoff (days)</b>
Pre-meeting Conference Call	Notify stakeholders of upcoming activities	(before kickoff)
Kickoff email	Provide data spreadsheets to be filled by Working Group (LDCs, IESO)	0
Face to Face Meeting		45
Data Collection Completed		60

The bulk of the activities in this phase take place between the kickoff email (trigger for Data Collection) and the face-to-face meeting around the 45th day of the 60-day. Working Group members were strongly encouraged to provide the requested information during this period so that any clarifications or corrections can be discussed at the face-to-face meeting. Generally speaking full 60 days were required to gather the necessary data and information. The PPWG report<sup>[4]</sup> and the Codes<sup>[3,4]</sup> outlined some of the basic information and data that LDCs must provide (such as load forecast) in a timely manner. In addition, Hydro One, in consultation with Working Group members, developed a list of additional information that would form the basis for NA. The following information and data was collected by the team members for each of the regions.

#### A.1-1 Load Forecast

LDCs are mandated by the August 2013 Code amendments to provide a ten year load forecast for the NA. The forecast would be the yearly peak load (either summer or winter as appropriate) of the transformer stations supplying the LDC and should be the coincident load forecast aggregated for all feeders at the DESN level.

LDCs directly connected to transmission facilities that have embedded LDCs connected provided the load forecast from their embedded LDCs and included it in their load forecast to the transmitter. Hydro One developed a template for LDCs so that data and information could be submitted in a consistent manner for efficient processing and analysis by the Working Group.



Large industrial customer load and load displacement generation can have an impact on the transmission system and therefore can influence regional planning significantly. Attempts were made to obtain their forecast and in the absence of any response, assumptions were made based on best information available to the Working Group.

### **A.1-2 Distributed Generation and Conservation and Demand Management**

During the Information Gathering phase, the IESO provided a 10-year forecast of CDM and DG targets for the region. Hydro One developed a template for the IESO so that data and information could be submitted in a consistent manner for efficient processing and analysis by the Working Group.

In order to produce accurate net demand forecasts for each of the regional planning activities, a standard set of assumptions were made by the IESO to account for the effect of future CDM and DG programs. Future conservation achievement was estimated by taking the 2013 Long Term Energy Plan (“LTEP”) conservation forecast and comparing it to the Ontario provincial peak demand forecast. This produced a peak demand percent offset amount for the province as a whole, which could be applied to peak demand forecasts in a region to estimate the effect of conservation programs. Note that this conservation forecast formed a baseline to a specific year, since existing conservation levels are already factored into a starting year’s forecast.

To estimate the effect of future DG projects, the IESO provided Hydro One and the Working Group with a list of all contracted projects which had not yet reached commercial operation. Peak capacity factors for these projects vary by technology type (i.e., wind, solar, biomass/gas, etc.) and can be assumed to be consistent with the IESO’s assumptions for long term assessments.

Accomplishments identified in this Report relating to CDM and DG for regions where an IRRP has been completed were provided by the IESO. This information is contained in Appendix C.

### **A.1-3 Historical Loads and Operational Information**

The IESO provided historical load data to set a reference point to which future load growth could be applied and for data reconciliation as described in Section E.3. In addition, the IESO also provided any operational and/or supply reliability issues that should be considered as part of regional planning consistent with the ORTAC<sup>[6]</sup>. For NA, these issues included:

- Any post contingency voltage and/or power factor issue,
- Load Security Criteria (Section 7.1 of ORTAC) – maximum load that can be curtailed with one or two elements out of service,
- Load Restoration Criteria (Section 7.2 of ORTAC) – maximum restoration time as a function of the amount of load interrupted.

### A.1-4 Facility Rating and Planned Investments/Replacements

For each region involving Hydro One assets, Hydro One provided equipment ratings, planned transmission investments over the next five years, replacement plans for any end of useful life of major equipment over the next five years, and historical loading from its Network Management System. Where required, LDCs were requested for ratings of facilities that they owned.

### A.2 Needs Assessment – Study Phase

Once the Information Gathering phase and data reconciliation is complete, the 60-day NA phase is initiated.

The key activities and timelines in this phase are identified in Table 4. The process was devised so as to allow reasonable time for the Working Group and lead transmitter to evaluate the regional needs as per the NA methodology described in Section 3, while also allowing time for team members to provide their input and comments within the Code-mandated 60-day timeline.

**Table 4. Needs Assessment Study Phase**

Key Activity	Description	Timeline from kickoff (days)
Kickoff Email	Inform Working Group participants of beginning of the NA phase	0
Draft Report Review, Face to Face Meeting	Discuss comments on draft NA Report and agree on changes	45
Final Report for Working Group Approval	Email final report to Working Group participants	60
Post NA Report	Post NA report on Hydro One regional planning website	Within a few days of the approval date

The outcome of NA phase will be one (or more) of the following:

- No Coordinated Planning Required** – Working Group analysis and assessment of the load supply capability in the region indicated that there are no foreseeable capacity issues over the next 10 years, which may require coordinated regional planning. As a result, the needs identified in the NA are local and can be preferably addressed by wires only solution(s) between the transmitter and LDCs; or the region or sub-region will be reassessed in the next planning cycle or earlier if there is a planning trigger due to another unforeseen need(s) prior to the next planning cycle.
- SA Required** – The needs identified in the NA require further assessment to determine if a solution(s) with a possible resource component should be considered or further coordinated planning is required. Accordingly, the SA led by the IESO will assess to confirm

if a RIP or an IRRP or a combination of the two should be undertaken to address the regional issues identified in NA.

### **A.3 Needs Assessment – Methodology**

Hydro One developed a NA methodology and assumptions to be used for NA phase and sought endorsement by the Working Group. This helped expedite the NA phase and complete the report in the Code-mandated 60 days.

Working Group members reviewed the historical loads and future load growth to ensure that the historical loads and load forecast used in the assessment were reasonably correct and properly aggregated at a regional or sub-regional level. Where required, the summer peak loads were adjusted for extreme weather conditions according to Hydro One’s methodology.

The load forecast provided by the LDCs was translated into a growth rate for the region or a relevant sub-region. This growth was applied onto the 2013 summer peak load as a reference point to identify any line or transformation capacity needs. To identify emerging capacity 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 one element out-of-service.

#### **A.3-1 Capacity Needs**

The gross demand forecast is used to develop a worst case scenario to first identify regional or sub-regional capacity needs. Both the gross demand forecast and the net demand forecast (which deducts forecasted CDM and DG contributions from the gross demand forecast) were used to confirm and determine the timing of the needs. In addition, a review of any ongoing and/or planned development projects in the region was undertaken during the study period.

#### **A.3-2 Supply Reliability and Transmission Adequacy**

Load reliability, security and transmission adequacy assessment is based on the ORTAC criteria that were introduced by the IESO in 2007. It is worth noting that prior to 2007 this criteria document was a guide for connection facilities and provided greater flexibility to customers on investments when reliability benefits were small and investment costs were significant for rate payers.

## APPENDIX B. REGIONAL INFRASTRUCTURE PLANNING METHODOLOGY

### B.1 Regional Infrastructure Plan

The outcome of the Regional Infrastructure Planning (RIP) phase is the RIP report which provides a consolidated account of all infrastructure planning developed during the current regional planning cycle. It includes not only the plans developed after the triggering of RIP but also any wires plan (e.g. Local Plans) which may have been triggered previously in this cycle. Resource options (e.g. CDM and DG) which may have been proposed in the IRRP are also described.

The RIP phase is officially triggered after the completion of all IRRPs in the region. However, this does not preclude the transmitter from being proactive and initiating planning studies on needs that require regional coordination as soon as they are identified during any of the earlier regional planning phases (such as NA, SA or IRRP). For instances where no regional IRRP is required, the RIP will be triggered after the last completed phase of the regional planning process.

The key activities in the RIP phase are listed in Table 5 with their respective timelines.

**Table 5. RIP Phase**

<b>Key Activity</b>	<b>Description</b>	<b>Typical timelines from kickoff (days)</b>
Kickoff Meeting	Outline process to team members. Request updates for Load Forecasts, CDM and DG.	0
Data Review and Validation	Update information if required	30
Preferred Options Identified	Identify options and select preferred option	120
Draft Report Review	Prepare draft report, review and finalize with team members	150
Report Published	Publish final report	180

It should be pointed out that some of the RIP activities may have been completed as part of earlier phases of the regional planning process. If the data, assumptions and criteria used for such activities are consistent with those provided prior to the RIP phase, it can be concluded that the results and recommendations are still valid. For such cases, in the interest of efficiency and expediency, these activities were not repeated during the RIP phase even though they are described in the RIP report.

### B.2 Data Review and Validation

At the beginning of the RIP phase LDCs are requested to provide updates to load forecasts provided for the IRRP or earlier phases of the Regional Planning process. If no updates are required, the

latest forecast will be used. The IESO will also be requested to provide updates regarding CDM and DG information.

Extreme weather correction models and high/low growth scenarios are taken into consideration when using the load forecasts to assess the regional needs.

### **B.3 Preferred Options**

Wires options are generated by the transmitter during this stage of the RIP phase. Options are developed based on their feasibility and cost effectiveness for addressing the identified needs. During the generation of preferred options, it is not uncommon for the “status quo” option to be considered before other, generally more costly options, are considered. If feasible and cost effective, the “status quo” may preclude the generation of additional options and may be selected, by default, as the preferred option. Whenever more than one option is considered, a budgetary estimate of each option is obtained to assist the preferred option selection.

The preferred option for each need addressed by an infrastructure solution is selected based on their long term cost/benefit. The rationale for the selection is then documented and recorded in the draft of RIP report for review and approval by the team members.

### **B.4 RIP Report**

A draft of the RIP report undergoes a review by all team members and every effort is made to ensure that the concerns of each member is taken into account and reflected in the report.

As per the timelines mandated by the OEB and inserted in the TSC, the RIP report must be completed within 6 months of the RIP kickoff meeting and publish on the transmitter’s website.

## APPENDIX C. CONSERVATION AND DG STATUS

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 2016 for the previous calendar year, the data shown is based on 2015 (inclusive of programs and persistence from 2011 through 2014). These savings do not include the available capacity due to system wide demand response initiatives, such as Capacity Based Demand Response (CBDR). As CBDR was a transitional program, information was not collected to provide available capacity by LDC. Efforts have been made to ensure that the data collected for new programs, such as the DR Auction, will track the savings at the LDC level. Due to the methodology used in monitoring and evaluating programs, verified results can only be provided by LDC, and not by planning region.

**Table 6. Conservation Status Update**

Region	Sub-region	LDC	Verified Net Annual Peak Demand Savings from Conservation Energy Efficiency Programs, Persisting in 2015 (MW)
Burlington to Nanticoke	Brant	Brantford Power Inc.	6.25
		Brant County Power Inc.	0.9
		<b>Total</b>	<b>7.15</b> <sup>[1]</sup>
	Bronte	Burlington Hydro	4.7
		Oakville Hydro	6.35
		<b>Total</b>	<b>11.05</b>
Metro Toronto	Central Toronto	Toronto Hydro	81.21
		<b>Total</b>	<b>81.21</b> <sup>[2]</sup>
KWGG	N/A	Kitchener-Wilmot Hydro	6.66
		Waterloo North Hydro	4.32
		Cambridge and North Dumfries Hydro	6
		Guelph Hydro Electric Systems Inc.	19.52
		<b>Total</b>	<b>36.5</b> <sup>[1]</sup>
Northwest Ontario	North of Dryden	<b>Total</b>	- <sup>[1]</sup>
	Greenstone-Marathon	<b>Total</b>	- <sup>[1]</sup>
	West of Thunder Bay	Fort Frances Power	0.08
		Atikokan Hydro	0.04
		Kenora Hydro	0.201
		Sioux Lookout Hydro	0.08
		<b>Total</b>	<b>0.401</b> <sup>[1]</sup>
Greater Ottawa	Ottawa	Hydro Ottawa Limited	26.743
		<b>Total</b>	<b>26.743</b> <sup>[1]</sup>

Windsor-Essex	N/A	ELK Energy Inc.	0.45
		Entegrus Inc.	6.56
		EnWin Utilities Ltd.	5.81
		Essex Powerlines Corp.	2.54
		<b>Total</b>	<b>15.36</b> <sup>[1]</sup>
GTA North	York	PowerStream Inc.	32.46
		Newmarket Tay Power Distribution Ltd	1.99
		<b>Total</b>	<b>34.45</b> <sup>[1]</sup>
GTA West	Northwest GTA	Hydro One Brampton	15.4
		Milton Hydro	2.9
		Halton Hills Hydro	1.597
		<b>Total</b>	<b>19.897</b> <sup>[1]</sup>
GTA East	Pickering-Ajax-Whitby	Veridian Connections	7.88
		Whitby Hydro	2.34
		<b>Total</b>	<b>10.22</b> <sup>[1]</sup>

Note [1]: Total does not include Hydro One Distribution. Total Hydro One Distribution conservation achievement for 2015 is 69.7 MW, however, Hydro One Distribution load is spread over many regions.

Note [2]: Total value is for Toronto Hydro's entire service territory and not only the Central Toronto Sub-region.

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/sub-region 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 assumptions applied in the region/sub-region load forecast. Data is based on the IESO contract list as of July 31, 2016.

**Table 7. DG Status Update**

Region	Sub-region	Station	Installed Capacity (MW)	Effective Capacity (MW)	Load Forecast Base Year/Peak
Burlington to Nanticoke	Brant	BRANT TS	10.746	4.298	Summer 2012
		BRANTFORD TS	6.103	2.441	
		POWERLINE MTS	2.817	1.127	
		<b>TOTAL</b>	<b>19.666</b>	<b>7.866</b>	
	Bronte	BRONTE TS	1.34	0.46	Summer 2014
		CUMBERLAND TS	1.88	0.64	
		BURLINGTON DESN	0.65	0.22	
		PALERMO TS	0	0	
		TRAFALGAR DESN	0	0	
		TREMAINE TS	0.68	0.23	

		GLENORCHY MTS	1.2	0.41	
		OAKVILLE #2 TS	0.41	0.14	
		<b>TOTAL</b>	<b>6.16</b>	<b>2.1</b>	
Metro Toronto	Central Toronto  (*): TS within the Central Toronto Sub- region	AGINCOURT TS	2.85	0.97	2013
		BASIN TS*	0.13	0.05	
		BATHURST TS DESN1	2.52	0.86	
		BATHURST TS DESN2	0.78	0.27	
		BERMONDSEY TS DESN1	0.83	0.28	
		BERMONDSEY TS DESN2	1.18	0.4	
		BRIDGMAN TS DESN1*	0.15	0.05	
		BRIDGMAN TS DESN4*	0.2	0.07	
		CARLAW TS*	0.67	0.23	
		CAVANAGH MTS	1.96	0.67	
		CECIL TS DESN1*	0.01	0.003	
		CECIL TS DESN2*	0.24	0.08	
		CHARLES TS DESN2*	0.3	0.1	
		DUFFERIN TS DESN1*	0.26	0.09	
		DUFFERIN TS DESN2*	0.56	0.19	
		DUPLEX TS DESN1*	0.03	0.01	
		DUPLEX TS DESN2*	0.22	0.07	
		ELLESMERE TS	2.53	0.86	
		ESPLANADE TS*	0.05	0.02	
		FAIRBANK TS DESN1*	0.44	0.15	
		FAIRBANK TS DESN2*	2.04	0.69	
		FAIRCHILD TS DESN1	1.57	0.53	
		FAIRCHILD TS DESN2	0.42	0.14	
		FINCH TS DESN1	1.27	0.43	
		FINCH TS DESN2	3.11	1.06	
		GLENGROVE TS DESN2*	0.19	0.07	
		HORNER TS*	1.48	0.5	
		JOHN TS DESN2*	0.04	0.01	
		LEASIDE TS DESN1*	0.32	0.11	
		LEASIDE TS DESN1*	0.13	0.04	
		LESLIE TS DESN1	0.74	0.25	
		LESLIE TS DESN2	1.03	0.35	
		MAIN TS*	0.59	0.2	
		MALVERN TS	1.89	0.64	
MANBY TS DESN1*	0.87	0.3			
MANBY TS DESN2*	0.09	0.03			
MANBY TS DESN3*	1.09	0.37			
REXDALE TS	3.91	1.33			



		RICHVIEW TS DESN1	1.56	0.53	
		RICHVIEW TS DESN2	1.37	0.47	
		RICHVIEW TS DESN3	0.01	0.003	
		RUNNYMEDE TS*	0.57	0.19	
		SCARBORO TS DESN1	1.83	0.62	
		SCARBORO TS DESN2	2.18	0.74	
		SHEPPARD TS DESN1	1.15	0.39	
		SHEPPARD TS DESN2	1.96	0.67	
		STRACHAN TS DESN1*	0.01	0.003	
		WARDEN TS	1.78	0.61	
		WILTSHIRE TS DESN1*	0.45	0.15	
		WILTSHIRE TS DESN2*	0.01	0.003	
		WOODBIDGE TS DESN1	0.12	0.04	
		<b>TOTAL</b>	<b>49.69</b>	<b>16.89</b>	
KWCG	N/A	ARLEN MTS	0.03	0.01	Summer 2010
		CAMBRIDGE #1	3.75	1.12	
		CAMPBELL TS	7.05	2.11	
		CEDAR TS	0.23	0.07	
		DETWEILER TS	0.02	0.01	
		ELMIRA TS	4.95	3.83	
		FERGUS TS	45.76	7.51	
		GALT TS	4.73	1.76	
		HANLON TS	0.45	0.14	
		KITCHENER #1	0.4	0.12	
		KITCHENER #3	1.65	0.5	
		KITCHENER #4	1.21	0.36	
		KITCHENER #5	1.72	0.52	
		KITCHENER #6	1.94	0.58	
		KITCHENER #7	1.13	0.34	
		KITCHENER #8	0.28	0.08	
		KITCHENER #9	0.65	0.2	
		PRESTON TS	2.17	0.65	
		PUSLINCH DS	0.99	0.3	
		RUSH MTS	0.27	0.08	
SCHEIFELE TS	3.12	0.94			
WATERLOO #3	1.17	0.35			
WOLVERTON DS	0.65	0.19			
		<b>TOTAL</b>	<b>84.3</b>	<b>21.8</b>	
Northwest Ontario	North of Dryden	No additional DG has come into service than was considered as part of the IRRP in section 4.2			
	Greenstone-	LONGLAC TS	0.01	0.003	Summer 2014

	Marathon	MARATHON DS	0.02	0.006	Winter 2014
		PIC DS	0.01	0.003	
		<b>TOTAL</b>	<b>0.04</b>	<b>0.01</b>	
	West of Thunder Bay	AGIMAK DS	-	-	
		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	0.0447	0.0018	
		MARGACH DS	-	-	
		MINAKI DS	-	-	
		MOOSE LAKE TS	0.0098	0.0004	
		NESTOR FALLS DS	-	-	
		SAM LAKE DS	0.0153	0.0006	
		SAPAWE DS	-	-	
		SHABAQUA DS	-	-	
		SIOUX NARROWS DS	0.01	0.0004	
	VALORA DS	-	-		
VERMILLION BAY DS	-	-			
<b>TOTAL</b>	<b>25</b>	<b>1</b>			
Greater Ottawa	Ottawa	ALBION TS	0.92	0.28	Summer 2012
		BILBERRY CREEK TS	0.67	0.2	
		BRIDLEWOOD MTS	0.07	0.02	
		CARLING TS	0.46	0.14	
		CENTER POINT MTS	0.06	0.02	
		CUMBERLAND DS	0.24	0.07	
		CYRVILLE MTS	0.3	0.09	
		ELLWOOD MTS	0.1	0.03	
		FALLOWFIELD DS	0.02	0.01	
		GREELY DS	0.31	0.09	
		HAWTHORNE TS	1.72	0.52	
		HINCHEY TS	0.06	0.02	
		KANATA MTS #1	1	0.3	
		KING EDWARD TS	0.11	0.03	
		LIMEBANK MTS	0.41	0.12	
LINCOLN HEIGHTS TS	0.19	0.06			

		LISGAR TS	0.05	0.02	
		MANORDALE MTS	0.03	0.01	
		MANOTICK DS	0.52	0.49	
		MARCHWOOD MTS	0.29	0.09	
		MARIONVILLE DS	0.23	0.07	
		MERIVALE MTS	0.12	0.04	
		MOULTON MTS	0.06	0.02	
		NAVAN DS	0.52	0.2	
		NEPEAN TS	1.55	0.47	
		OVERBROOK TS	0.97	0.29	
		RICHMOND MTS	0.26	0.08	
		RIVERDALE TS	0.18	0.05	
		ROCKLAND DS	0.04	0.01	
		ROCKLAND EAST DS	0.04	0.01	
		RUSSELL DS	0.03	0.01	
		RUSSELL TS	1.88	0.56	
		SOUTH GLOUCESTER DS	0.09	0.03	
		SOUTH MARCH TS	1.54	0.46	
		TERRY FOX MTS	0.02	0.01	
		UPLANDS MTS #2	0.15	0.05	
		WENDOVER DS	0.21	0.06	
		WILHAVEN DS	1.64	0.5	
		WOODROFFE TS	0.17	0.05	
		<b>TOTAL**</b>	<b>17.17</b>	<b>5.56</b>	
		(**): This report has reduced MW of connected DG comparing to 2015 since the 2015 report had mistakenly included the committed DG that will be connected beyond 2016.			
Windsor- Essex	N/A	KEITH TS	36.5	16	2013
		KINGSVILLE TS	24.3	16.3	
		BELLE RIVER TS	11.6	2.4	
		TILBURY WEST TS	11.2	2.2	
		TILBURY TS	5	2.2	
		LAUZON TS	29	7.3	
		MALDEN	64	14.6	
		WALKER TS #1	4.6	0.7	
		WALKER TS #2	2.9	1.3	
		ESSEX TS	0.3	0.1	
		CRAWFORD TS	0.5	0.2	
		<b>TOTAL</b>	<b>186.8</b>	<b>63.3</b>	
GTA North	York	ARMITAGE TS	9.2	3.1	Summer 2013
		BROWN HILL TS	31	10.5	
		BUTTONVILLE TS	1.5	0.5	

		HOLLAND TS	3	1	
		MARKHAM 1 MTS	1.9	0.6	
		MARKHAM 2 MTS	9.8	5.9	
		MARKHAM 3 MTS	7.7	4.5	
		MARKHAM 4 MTS	0.4	0.1	
		RICHMOND HILL MTS	2.7	0.9	
		VAUGHAN 1 MTS	5.1	1.7	
		VAUGHAN 2 MTS	3	1	
		VAUGHAN 3 MTS	2.1	0.7	
		<b>TOTAL</b>	<b>77.3</b>	<b>30.8</b>	
GTA West	Northwest GTA	BRAMALEA TS	4.69	1.6	Summer 2012
		GOREWAY TS	7.32	2.49	
		HALTON TS	2.73	0.93	
		JIM YARROW MTS	3.54	1.2	
		KLEINBURG TS	4.96	3.82	
		PLEASANT TS	9.46	3.22	
		TREMAINE TS	0.75	0.26	
		WOODBRIIDGE TS	0.71	0.24	
		<b>TOTAL</b>	<b>34.16</b>	<b>13.75</b>	
GTA East	Pickering- Ajax-Whitby	WHITBY TS	1.19	0.38	Summer 2015
		<b>TOTAL</b>	<b>1.19</b>	<b>0.38</b>	

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

Region	Sub-Region	Other Electricity System Initiatives
Burlington to Nanticoke	Brant	The IESO, with input from the Brant area LDCs, has 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. The pilot is intended to help the IESO and LDCs test the use of DR to assist with local capacity needs and will provide interim capacity relief, if needed, until additional capacity provided by transmission reinforcements are in place in 2019.
	Bronte	The Town of Oakville has indicated that they are in the early stages or preparing a Community Energy Plan. The IESO has committed to working with the town to coordinate planning initiatives.
Metro Toronto	Central Toronto	No additional electricity system initiatives have been undertaken in this sub-region at this time.
KWCG	N/A	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

Northwest Ontario	North of Dryden	No additional electricity system initiatives have been undertaken in this sub-region at this time.
	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.).
	West of Thunder Bay	City of Kenora has indicated that they are in the early stages of preparing a Community Energy Plan. The IESO has been working with the City to coordinate planning activities
Greater Ottawa	Ottawa	No additional electricity system initiatives have been undertaken in this sub-region at this time.
Windsor-Essex	N/A	In 2014, Hydro One applied to the Ontario Energy Board (“Board”) for Leave-to-Construct the Supply to Essex County Transmission Reinforcement Project (“SECTR”). In July 2014, the Board approved the need for this transmission reinforcement project as an outcome of Phase 1 of this proceeding. A decision on Phase 2 of the proceeding is still outstanding. More information on the SECTR project at the regulatory proceeding may be found on the Board website under Board file number EB-2014-0421. In June 2016 the Municipality of Chatham-Kent Council adopted a Community Energy Plan.
GTA North	York	The local utilities, PowerStream and New Market Tay Power, are engaging in a number of pilots, including Micro Grid project, storage and residential solar storage technologies. The municipalities of Markham, Vaughan and Newmarket are 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.
GTA West	Northwest GTA	No additional electricity system initiatives have been undertaken in this sub-region at this time. Halton Hills Hydro has described the proposed HHH MTS in their 2016-2020 Distribution System Plan, filed with the Board on October 2, 2015. Targeted in service date is 2018. As the capital requirement for this project is significant, HHH intends to file a separate Incremental Capital Module (ICM) for associated expenditures rather than including in this Distribution System Plan.
GTA East	Pickering-Ajax-Whitby	The Region of Durham has indicated that they are in the early stages or preparing a Community Energy Plan. The IESO has committed to working with the Region to coordinate planning initiatives.

## **APPENDIX D. LDC SURVEYS**

### **D.1 Survey Objectives**

As an on-going effort to ensure that the Regional Planning process can be enhanced and also meets the objectives that were laid out in the PPWG report, Hydro One has conducted two surveys to seek the views of the LDCs. The survey was conducted for the LDCs who participated in the NA and the RIP phases led by Hydro One.

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 surveys were limited to the LDCs for an assessment of the phases that were completed since the last annual report in 2015. Since then, Hydro One working with the IESO and a number of LDCs representatives completed the first set of RIP reports in several regions along with NA reports for the remaining Group 2 and 3 regions<sup>3</sup>.

### **D.2 Group 1 – RIP Phase Survey**

The RIP survey was conducted in Q2 of 2016 shortly after this phase was completed for the following regions:

- Greater Ottawa
- Kitchener/Waterloo/Cambridge/Guelph
- GTA North
- GTA West
- Metro Toronto
- Windsor-Essex

All 24 LDCs which participated in the RIP phase were invited to participate in the survey. 17 of the LDCs representative responded to the survey. Two LDCs did not complete the survey because they felt their participation was marginal.

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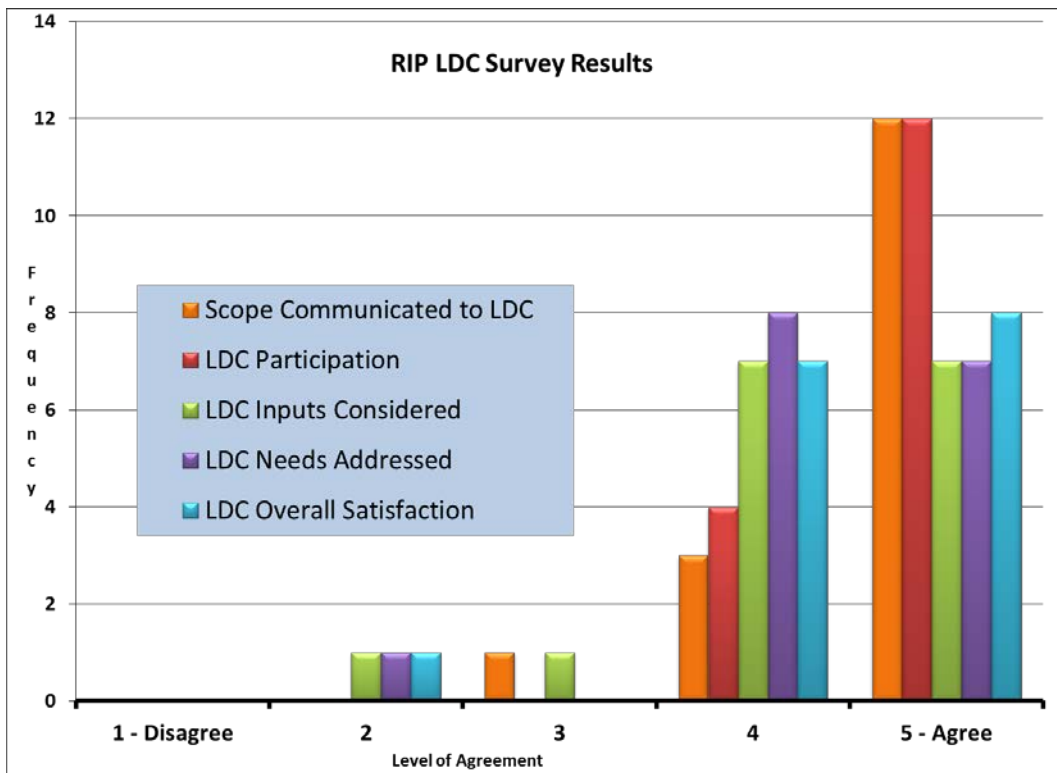
<sup>3</sup> The survey for NAs completed for Group 1 was reported in the 2014 Annual Status Report.

### D.2-1 Survey Questions

The LDCs were asked about their level of agreement with the following statements:

- The scope of the Regional Infrastructure Planning (RIP) process was clearly defined and communicated at the kickoff meeting;
- LDC was able to participate in RIP phase as per the PPWG report and Code amendments;
- LDC’s inputs were properly discussed and considered;
- LDC’s needs were properly addressed;
- LDC was satisfied with the final RIP report;
- Any other comments on any of the phases of the Regional Planning process.

The responses to the survey questions were compiled and the results are displayed graphically on Figure D-1.



**Figure D-1 RIP Survey Results**

As illustrated by the graph, there was a consensus among the LDCs that the scope of the RIP was properly communicated and that they were active participants in the process. There was also a consensus that the LDC’s needs were properly addressed in the RIP report for the region.

## D.2-2 Survey Comments

The LDCs were also given the opportunity to comment not just on the RIP phase but also on any other aspect of the Regional Planning process. These comments are summarized below.

Aspects that are working well:

- Inclusive process;
- Sharing of information and collaboration among LDCs;
- Effective meetings;
- Processes understood by Working Group members and proceeded smoothly;
- Expertise provided by Hydro One as a lead transmitter.

Aspects that can be improved:

- Possible duplication of efforts/information during each phase of the process;
- Difficulty in reconciling historical loads;
- Some instances may require more time for analysis.

Hydro One plans to follow up with all LDCs and provide them a summary of survey results. In addition, LDCs that provided comments will be provided a response and also contacted to discuss and address their concern.

## D.3 Group 2 & 3 – NA Phase Survey

The NA phase was completed for all regions in Q2 2016. The NA survey was conducted in the Q3 of 2016 shortly after NA phase was completed for Groups 2 and 3.

The survey was conducted via the website Survey Monkey and sent to 31 LDCs and 19 responded. It should be noted that an attempt was made to survey all members of the NA Working Groups.

In addition to the four general objectives identified in the opening section of this Appendix, this survey also captured the following additional aspects:

- Time constraints
- Community plans<sup>4</sup>
- Communication of NA results

The survey results are discussed in the following sections.

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<sup>4</sup> Regarding the existence of Municipal/Community Energy Plans that would impact the NA only two LDCs indicated the existence of such approved plans.



## **D.3-1 Survey Questions**

### **Understanding the Process and Scope**

Understanding the purpose of the NA and the scope of the work to be performed was generally confirmed as approximately 54% of the respondent stated that they understood the process and scope very well or well and 42% understood somewhat well.

The scope of the work required for the NA phase was clear to 69% of the respondents.

### **Time Constraints**

The time required for the information gathering and for the NA report preparation was sufficient for 69% of respondents with 23% indicating that a little more time would be required. Whenever time constraints were indicated as a problem there was a consensus that additional 10-20 working days would address the issue.

Time required to complete the NA report was acceptable to 77% of respondents.

Some of the reasons for concern for the time constraint were:

- Difficulty in properly reconciling issues related to load transfers to avoid “double counting” for non-coincident peaks;
- Gathering information from embedded LDCs;
- Time constraints in terms of calendar days can be impacted by seasonal holidays.

### **Final Product Evaluation**

LDCs were surveyed regarding the identification of regional needs and how they are addressed in the NA. 68% of respondents were satisfied with this activity in the NA phase. 92% of respondents indicated that their LDC’s needs/concerns were represented in the report. Some of the suggestions cited in the survey were:

- Planning horizon for NA should be extended beyond 10 years;
- Approach to asset end-of-life replacement.

### **Results Communication**

LDCs were also asked about the communication channels used to convey the results in the NA report. Emails were the preferred form of communication followed by Community Meeting/Event. Some of responses indicated following communication options in addition to the ones provided in the survey were:

- Rate Application to the OEB;
- Distribution System Plan;

- Information has already been adequately provided in LDC's plans;
- LDC's Board;
- Findings were already available.

### **D.3-2 Survey Comments**

LDCs had the opportunity to highlight both positive aspects of the NA phase and aspects that required further improvement. A summary of the comments provided is shown below.

#### **Positive Aspects**

The following is a summarized version of the positive aspects of the NA phase identified by the LDCs surveyed:

- Cooperation, interaction and collaboration among Working Group members;
- Clearly defined regional process that is not fragmented;
- Better understanding of regional issues;
- Inclusiveness in the decision process;
- Knowledgeable Working Group members.

#### **Aspects which can be improved**

The following areas were identified where improvements can be made by the Working Group:

- Consistency in the load forecast methodology;
- On-going transparency and continuous information flow throughout the year;
- Consideration of long-term assessment and scenarios (20 to 30 years);
- At times, schedules are tight in light of mandatory time constraints.

## **D.4 Conclusions**

Overall there is a consensus among the LDCs in the Hydro One led RIP and NA phases of the Regional Planning that the process was:

- Completed in a timely manner;
- Transparent and open discussions;
- Aligned with LDCs requirements.

#### **Next Steps**

Hydro One is planning to undertake the following:

- Hydro One has developed and utilized a template for load forecast so that it can be used and applied in a consistent manner during NA phase. With the completion of first cycle of the

Regional Planning process, Hydro One plans to consult/discuss with the LDCs on how to enhance this process;

- Communicate and provide LDCs a periodic update on the regional planning activity/progress in the region;
- Discuss with the Working Group to consider long-term identification of needs during the NA phase in the next cycle;
- Discuss with the Working Group to consider in depth review if and when relevant during NA phase.

Finally, Hydro One plans to follow up with all LDCs and provide them a summary of survey results. In addition, LDCs that provided comments will also be provided a response and contacted to discuss their concern.

## APPENDIX E. NEEDS ASSESSMENT REPORT LINKS

**Burlington to Nanticoke (May 23, 2014):**

<http://www.hydroone.com/RegionalPlanning/Burlington/Documents/Needs%20Assessment%20Report%20-%20Burlington%20to%20Nanticoke%20Region.pdf>

**Greater Ottawa – Outer Ottawa Sub-region (July 28, 2014):**

<http://www.hydroone.com/RegionalPlanning/Ottawa/Documents/Needs%20Assessment%20Report%20-%20Greater%20Ottawa%20-%20Outer%20Ottawa%20SubRegion.pdf>

**GTA East (August 11, 2014):**

[http://www.hydroone.com/RegionalPlanning/GTA\\_East/Documents/Needs%20Assessment%20Report%20-%20GTA%20East%20Region.pdf](http://www.hydroone.com/RegionalPlanning/GTA_East/Documents/Needs%20Assessment%20Report%20-%20GTA%20East%20Region.pdf)

**GTA North – Western Sub-region (June 27, 2014):**

<http://www.hydroone.com/RegionalPlanning/GTANorth/Documents/Needs%20Assessment%20Report%20-%20GTA%20North%20-%20Western%20Subregion.pdf>

**GTA West – Southern Sub-region (May 30, 2014):**

<http://www.hydroone.com/RegionalPlanning/GTAWest/Documents/Needs%20Assessment%20Report%20-%20GTA%20West%20-%20Southern%20Subregion.pdf>

**Metro Toronto – Northern Sub-region (June 11, 2014):**

<http://www.hydroone.com/RegionalPlanning/Toronto/Documents/Needs%20Assessment%20Report%20-%20Metro%20Toronto%20-%20Northern%20Subregion.pdf>

**London Area (April 1, 2015):**

<http://www.hydroone.com/RegionalPlanning/LondonArea/Documents/Needs%20Assessment%20Report%20%20London%20Region%20%20April%202015.pdf>

**Peterborough to Kingston (February 10, 2015):**

[http://www.hydroone.com/RegionalPlanning/Peterborough/Documents/Needs%20Assessment%20Report%20%20Peterborough%20to%20Kingston%20%2010\\_Feb\\_2015%20\(FINAL\).pdf](http://www.hydroone.com/RegionalPlanning/Peterborough/Documents/Needs%20Assessment%20Report%20%20Peterborough%20to%20Kingston%20%2010_Feb_2015%20(FINAL).pdf)

**South Georgian Bay/Muskoka (March 3, 2015):**

<http://www.hydroone.com/RegionalPlanning/SGBMuskoka/Documents/Needs%20Assessment%20Report%20%20South%20Georgian%20BayMuskoka%20%2003%20Mar%202015.pdf>

**Sudbury/Algoma (March 12, 2015):**

<http://www.hydroone.com/RegionalPlanning/SudburyAlgoma/Documents/Needs%20Assessment%20Report%20%20Sudbury%20Algoma%20Mar12%202015.pdf>

**Chatham/Lambton/Sarnia (June 12, 2016): NEW**

<http://www.hydroone.com/RegionalPlanning/Chatham/Documents/Needs%20Assessment%20Report%20-%20Chatham-Kent-Lambton-Sarnia.pdf>

**Greater Bruce/Huron (May 6, 2016): NEW**

<http://www.hydroone.com/RegionalPlanning/GreaterBruce-Huron/Documents/Needs%20Assessment%20Report%20-%20GreaterBruce-Huron%20Region.pdf>

**Niagara (April 30, 2016): NEW**

<http://www.hydroone.com/RegionalPlanning/Niagara/Documents/Needs%20Assessment%20Report%20-%20Niagara.pdf>

**North/East of Sudbury (April 15, 2016): NEW**

<http://www.hydroone.com/RegionalPlanning/NE-Sudbury/Documents/Needs%20Assessment%20Report%20-%20North%20and%20East%20of%20Sudbury.pdf>

**Renfrew (March 11, 2016): NEW**

<http://www.hydroone.com/RegionalPlanning/Renfrew/Documents/Needs%20Assessment%20Report%20-%20Renfrew%20Region%20-%20March%2011%202016.pdf>

**St. Lawrence (April 29, 2016): NEW**

<http://www.hydroone.com/RegionalPlanning/St-Lawrence/Documents/Needs%20Assessment%20Report%20-%20St%20Lawrence.pdf>

## APPENDIX F. LOCAL PLANNING REPORT LINKS

**GTA East – Wilson TS and Thornton TS Station Capacity Mitigation (May 15, 2015):**

[http://www.hydroone.com/RegionalPlanning/GTA East/Documents/Local%20Planning%20Report%20-%20WilsonThornton%20-%202015\\_May\\_2015%20-%20Final.pdf](http://www.hydroone.com/RegionalPlanning/GTA%20East/Documents/Local%20Planning%20Report%20-%20WilsonThornton%20-%202015_May_2015%20-%20Final.pdf)

**GTA West – Erindale TS T1/T2 DESN Capacity Relief (July 9, 2015):**

[http://www.hydroone.com/RegionalPlanning/GTAWest/Documents/Local%20Planning%20Report%20-%20Erindale%20TS%20Capacity%20-%2009\\_July\\_2015.pdf](http://www.hydroone.com/RegionalPlanning/GTAWest/Documents/Local%20Planning%20Report%20-%20Erindale%20TS%20Capacity%20-%2009_July_2015.pdf)

**Greater Ottawa – B5D/D5A Load Restoration (September 22, 2015):**

<http://www.hydroone.com/RegionalPlanning/Ottawa/Documents/Local%20Planning%20Report%20-%20B5D-D5A%20Load%20Restoration.pdf>

**Metro Toronto – Circuit C10A Transmission Line Capacity Mitigation (August 13, 2015):**

<http://www.hydroone.com/RegionalPlanning/Toronto/Documents/Local%20Planning%20Report%20-%20Metro%20Toronto%20C10A.pdf>

**Sudbury/Algoma – Manitoulin TS Low Voltage Regulation (September 30, 2015):**

<http://www.hydroone.com/RegionalPlanning/Sudbury-Algoma/Documents/Local%20Planning%20Report%20-Sudbury-Algoma%20Sep30-15.pdf>

**Peterborough to Kingston – Gardiner TS Load Balancing (October 7, 2015):**

<http://www.hydroone.com/RegionalPlanning/Peterborough/Documents/Local%20Planning%20Report%20-%20Gardner%20TS%20Load%20Balancing.pdf>

**Burlington to Nanticoke (October 28, 2015):**

<http://www.hydroone.com/RegionalPlanning/Burlington/Documents/Local%20Planning%20Report%20-%20Burlington%20to%20Nanticoke%20Region.pdf>

**Greater Ottawa – Supply to East Ottawa Area (November 26, 2015): <sup>NEW</sup>**

<http://www.hydroone.com/RegionalPlanning/Ottawa/Documents/Local%20Planning%20Report%20-%20Supply%20to%20East%20Ottawa%20Area.pdf>

**South Georgian Bay/Muskoka – Orangeville TS End-of-Life Replacement (May 27, 2016): <sup>NEW</sup>**

<http://www.hydroone.com/RegionalPlanning/SGB-Muskoka/Documents/Local%20Planning%20Report%20-Orangeville%20TS%20EOL%20Replacement.pdf>

## **APPENDIX G. SCOPING ASSESSMENT LINKS**

**Burlington to Nanticoke Scoping Assessment (September 25, 2014):**

[http://www.ieso.ca/Documents/Regional-Planning/Burlington to Nanticoke/Scoping%20Assessment%20Outcome%20Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Burlington_to_Nanticoke/Scoping%20Assessment%20Outcome%20Report.pdf)

**GTA East Scoping Assessment (December 15, 2014):**

[http://www.ieso.ca/Documents/Regional-Planning/GTA East/GTA-East-Scoping-Assessment-Final-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/GTA_East/GTA-East-Scoping-Assessment-Final-Report.pdf)

**GTA West – Southern Sub-region Scoping Assessment (September 19, 2014):**

[http://www.ieso.ca/Documents/Regional-Planning/GTA West/Scoping-Assessment-Outcome-Report-September-2014.pdf](http://www.ieso.ca/Documents/Regional-Planning/GTA_West/Scoping-Assessment-Outcome-Report-September-2014.pdf)

**Northwest Ontario Scoping Assessment (January 28, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/Northwest Ontario/Final Northwest Scoping Process Outcome Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Northwest_Ontario/Final_Northwest_Scoping_Process_Outcome_Report.pdf)

**London Area Scoping Assessment (August 28, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/London-Area/London Area Scoping Assessment Report TOR for IRRP and RIP.pdf](http://www.ieso.ca/Documents/Regional-Planning/London-Area/London_Area_Scoping_Assessment_Report_TOR_for_IRRP_and_RIP.pdf)

**South Georgian Bay/Muskoka Scoping Assessment (June 22, 2015):**

<http://www.ieso.ca/Documents/Regional-Planning/South-Georgian-Bay-Muskoka/SGBM-Scoping-Process-Outcome-Report-Final-20150622.pdf>

## APPENDIX H. IRRP LINKS

**Burlington to Nanticoke – Brant Sub-region IRRP (April 28, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/Burlington to Nanticoke/2015-Brant-IRRP-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Burlington%20to%20Nanticoke/2015-Brant-IRRP-Report.pdf)

**Greater Ottawa – Ottawa Sub-region IRRP (April 28, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/Greater Ottawa/2015-Ottawa-IRRP-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Greater%20Ottawa/2015-Ottawa-IRRP-Report.pdf)

**GTA North – York Sub-region IRRP (April 28, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/GTA North/2015-York-Region-IRRP-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/GTA%20North/2015-York-Region-IRRP-Report.pdf)

**GTA West – Northwestern Sub-region IRRP (April 28, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/GTA West/2015-Northwest-GTA-IRRP-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/GTA%20West/2015-Northwest-GTA-IRRP-Report.pdf)

**KWCG IRRP (April 28, 2015):**

<http://www.ieso.ca/Documents/Regional-Planning/KWCG/2015-KWCG-IRRP-Report.pdf>

**Metro Toronto – Central Downtown IRRP (April 28, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/Metro Toronto/2015-Central-Toronto-IRRP-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Metro%20Toronto/2015-Central-Toronto-IRRP-Report.pdf)

**Northwest Ontario – North of Dryden Sub-region IRRP (January 27, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/Northwest Ontario/North of Dryden/North-Dryden-Report-2015-01-27.pdf](http://www.ieso.ca/Documents/Regional-Planning/Northwest%20Ontario/North%20of%20Dryden/North-Dryden-Report-2015-01-27.pdf)

**Windsor Essex IRRP (April 28, 2015):**

[http://www.ieso.ca/Documents/Regional-Planning/Windsor Essex/2015-Windsor-Essex-IRRP-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Windsor%20Essex/2015-Windsor-Essex-IRRP-Report.pdf)

**Burlington to Nanticoke – Bronte Sub-region IRRP (June 30, 2016): **NEW****

[http://www.ieso.ca/Documents/Regional-Planning/Burlington to Nanticoke/2016-Bronte-IRRP-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Burlington%20to%20Nanticoke/2016-Bronte-IRRP-Report.pdf)

**GTA East – Pickering-Ajax-Whitby Sub-region IRRP (June 30, 2016): **NEW****

[http://www.ieso.ca/Documents/Regional-Planning/GTA East/2016-Pickering-Ajax-Whitby-IRRP-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/GTA%20East/2016-Pickering-Ajax-Whitby-IRRP-Report.pdf)

**Northwest Ontario- Greenstone-Marathon IRRP (June 30, 2016): **NEW****



[http://www.ieso.ca/Documents/Regional-Planning/Northwest Ontario/Greenstone Marathon/2016-Greenstone-Marathon-IRR-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Northwest%20Ontario/Greenstone%20Marathon/2016-Greenstone-Marathon-IRR-Report.pdf)

**Northwest Ontario - West of Thunder Bay IRRP (July 27, 2016): NEW**

[http://www.ieso.ca/Documents/Regional-Planning/Northwest Ontario/West of Thunder Bay/2016-West-of-Thunder-Bay-IRR-Report.pdf](http://www.ieso.ca/Documents/Regional-Planning/Northwest%20Ontario/West%20of%20Thunder%20Bay/2016-West-of-Thunder-Bay-IRR-Report.pdf)

## APPENDIX I. RIP LINKS

**Greater Ottawa RIP (December 2, 2015):** **NEW**

<http://www.hydroone.com/RegionalPlanning/Ottawa/Documents/RIP%20Report%20Greater%20Ottawa.pdf>

**GTA North RIP (February 5, 2016):** **NEW**

<http://www.hydroone.com/RegionalPlanning/GTANorth/Documents/RIP%20Report%20GTA%20North.pdf>

**GTA West RIP (January 25, 2016):** **NEW**

[http://www.hydroone.com/RegionalPlanning/GTAWest/Documents/RIP%20Report\\_GTA%20West.pdf](http://www.hydroone.com/RegionalPlanning/GTAWest/Documents/RIP%20Report_GTA%20West.pdf)

**Kitchener-Waterloo-Cambridge-Guelph (KWCG) RIP (December 15, 2015):** **NEW**

<http://www.hydroone.com/RegionalPlanning/KWCG/Documents/KWCG%20RIP%20Report.pdf>

**Metro Toronto RIP (January 12, 2016):** **NEW**

<http://www.hydroone.com/RegionalPlanning/Toronto/Documents/RIP%20Report%20Metro%20Toronto.pdf>

**Windsor-Essex RIP (December 22, 2015):** **NEW**

<http://www.hydroone.com/RegionalPlanning/Windsor-Essex/Documents/RIP%20Report%20Windsor-Essex.pdf>

**Peterborough to Kingston RIP (July 8, 2016):** **NEW**

<http://www.hydroone.com/RegionalPlanning/Peterborough/Documents/RIP%20Report%20-%20Peterborough%20to%20Kingston%20Region.pdf>

**Sudbury/Algoma RIP (June 10, 2016):** **NEW**

<http://www.hydroone.com/RegionalPlanning/Sudbury-Algoma/Documents/RIP%20Report%20-%20%20Sudbury%20Algoma%20Region.pdf>

**Renfrew RIP (July 22, 2016):** **NEW**

<http://www.hydroone.com/RegionalPlanning/Renfrew/Documents/RIP%20Report%20-%20Renfrew.pdf>

**St. Lawrence RIP (July 22, 2016):** **NEW**

<http://www.hydroone.com/RegionalPlanning/St-Lawrence/Documents/RIP%20St%20Lawrence.pdf>

## APPENDIX J. PLANNING STATUS LETTERS

The TSC requires that s 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:

- Cambridge North Dumfries Hydro Inc.
- Chapleau Public Utilities Corp.
- EnWin Utilities Inc.
- Fort Frances Power Corp.
- Grimsby Power Inc.
- Guelph Hydro Electric Systems Inc.
- Haldimand County Hydro Inc.
- Halton Hills Hydro Inc.
- Hearst Power Distribution Company Limited
- Hydro One Brampton Networks Inc.
- Hydro One Distribution
- Milton Hydro Distribution Inc.
- Niagara-on-the-Lake Hydro Inc.
- North Bay Hydro Distribution Limited
- Oakville Hydro Electricity Distribution Inc.
- Oshawa PUC Networks Inc.
- Ottawa River Power Corporation
- Toronto Hydro Electric System Limited
- Veridian Connections Inc.
- Waterloo North Hydro Inc.
- Wellington North Power Inc.
- Woodstock Hydro Services Inc.

## **APPENDIX K. IESO HAND-OFF LETTERS LINKS**

**Burlington to Nanticoke – Brant Sub-region (February 6, 2014):**

<http://www.hydroone.com/RegionalPlanning/Burlington/Documents/OPA%20Letter%20-%20Burlington%20Nanticoke%20-%20Brant.pdf>

**Greater Ottawa – Ottawa Sub-region (June 27, 2014):**

<http://www.hydroone.com/RegionalPlanning/Ottawa/Documents/Letter%20to%20H1%20RE%20Ottawa.pdf>

**GTA North – York Sub-region (June 14, 2013):**

<http://www.hydroone.com/RegionalPlanning/GTANorth/Documents/OPA%20Letter%20to%20Hydro%20One%20%20Regarding%20%20York%20Subregion.pdf>

**KWCG Region (May 29, 2013):**

<http://www.hydroone.com/RegionalPlanning/KWCG/Documents/OPA%20Letter%20to%20Hydro%20One%20%20Regarding%20KWCG.pdf>

**Metro Toronto – Central Downtown Sub-region (December 27, 2013):**

<http://www.hydroone.com/RegionalPlanning/Toronto/Documents/OPA%20Letter%20to%20Hydro%20One%20Regarding%20Central%20Toronto%20Subregion.pdf>