Peterborough-Kingston Region

Scoping Assessment Outcome Report

May 4, 2020

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Contents

1 Introduction

This Scoping Assessment Outcome Report is the result of the Ontario Energy Board's (OEB or Board) regional planning process. The Board endorsed the Planning Process Working Group's Report to the Board in May 2013 and formalized the process and timelines through changes to the Transmission System Code and Distribution System Code in August 2013.

The first cycle of the regional planning process for the Peterborough-Kingston region was completed in July 2016. The second cycle for this region was initiated in December 2019, consistent with the five-year minimum regional planning review cycle. The Needs Assessment (NA) is the first step in the regional planning process and was carried out by the study team led by Hydro One Networks Inc. (Hydro One). The NA report was issued on February 10, 2020 and concluded that a number of electricity-related needs require regional coordination. The recommendations from the NA report form the basis for the Scoping Assessment (SA) process that determines which planning process(es) will be employed to address those needs.

During the SA, regional participants reviewed the nature and timing of known needs to determine the most appropriate planning approach, as well as the best geographic grouping of the needs in order to efficiently facilitate further studies. The planning approaches considered include:

- An Integrated Regional Resource Plan (IRRP) – through which a greater range of options, including non-wires alternatives, are to be considered and/or closer coordination with communities and stakeholders is required;
- A Regional Infrastructure Plan (RIP) – which considers more straight-forward wires-only options with limited engagement; or
- A local plan undertaken by the transmitter and affected local distribution company (LDC)– for which no further regional coordination is needed.

This report:

- Lists the needs requiring more comprehensive planning and regional coordination, as identified by the regional participants;
- Reassesses the areas that must be studied and the geographic grouping of needs;
- Determines the appropriate regional planning approach and scope where a need for regional coordination or more comprehensive planning is identified;
- Creates terms of reference when an IRRP is the recommended approach;
- Establishes the composition of the IRRP Technical Working Group (Working Group).

2 Team

The Scoping Assessment was carried out by a study team comprising the following regional participants:

- Independent Electricity System Operator (IESO)
- Hydro One Networks Inc. (Hydro One Transmission)
- Hydro One Networks Inc. (Hydro One Distribution)
- Eastern Ontario Power
- Peterborough Distribution Inc.
- Elexicon Energy
- Kingston Hydro
- Lakefront Utilities Inc.

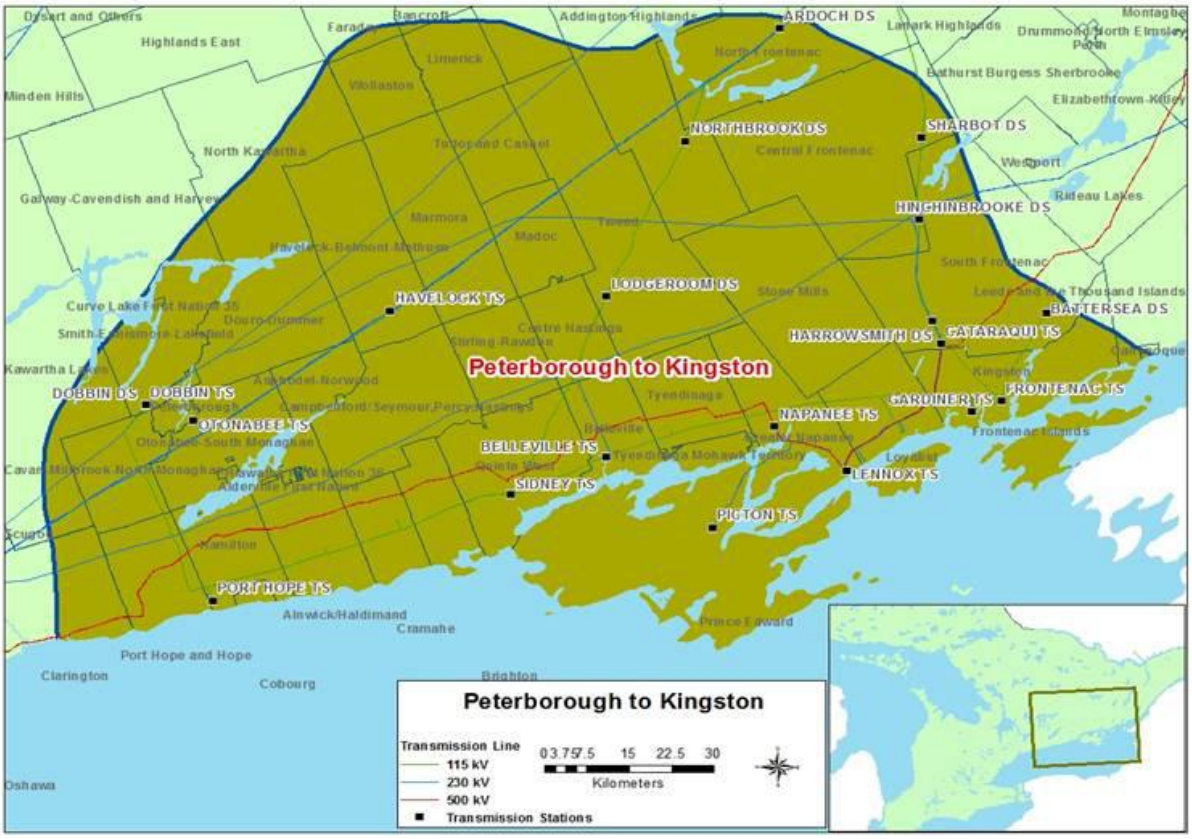
3 Categories of Needs, Analysis and Results

3.1 Overview of the Region

The Peterborough-Kingston region is located in eastern Ontario and includes Frontenac County, Hastings County, Northumberland County, Peterborough County, Prince Edward County, parts of Lennox and Addington County, and related municipalities. Peterborough and Kingston are the two largest population centres in the region. The region also comprises several Indigenous communities including Kawartha Nishnawbe, Mohawks of the Bay of Quinte, Curve Lake First Nation, and Alderville First Nation.

For electricity planning purposes, the planning region is defined by electricity infrastructure boundaries, not municipal boundaries. The electricity infrastructure supplying the Peterborough-Kingston region is shown in Figure 1. Hydro One owns the transmission assets in this region.

Figure 3. Electricity Infrastructure in the Peterborough-Kingston Region



The region is supplied by five local distribution companies. Eastern Ontario Power serves over 3,500 distribution customers in Gananoque, Ontario. Lakefront Utilities serves 10,000 distribution customers across the Town of Cobourg and the Village of Colborne. Peterborough

Distribution serves distribution customers in Peterborough, Lakefield, and Norwood. Kingston Utilities serves 28,000 distribution customers in Central Kingston. Hydro One Distribution supplies distribution customers in the surrounding areas of the region. These five LDCs receive power at the step-down transformer stations and distribute it to end users, i.e., industrial, commercial and residential customers.

Electrical supply to the Peterborough-Kingston region is provided through a network of 230 kilovolt (kV) and 115 kV circuits supplied by two 500/230 kV transformers at Lennox Transformer Station (TS), and four 230/115 kV transformers: two at Cataraqui TS and two at Dobbin TS. There are 10 step-down transformer stations in the area: Dobbin TS, Port Hope TS, Sidney TS, Picton TS, Otonabee TS, Havelock TS, Belleville TS, Napanee TS, Gardiner TS, and Frontenac TS. There area also eight High Voltage Distribution Stations (HVDS) in the region: Dobbin DS, Ardoch DS, Northbook DS, Lodgeroom DS, Hinchinbrooke DS, Harrowsmith DS, Sharbot DS, and Battersea DS. Finally, there are five Customer Transformer Stations (CTS) in the region: TransCanada Pipelines Cobourg CTS, TransCanada Pipelines Belleville CTS, Enbridge Pipelines Hilton CTS, Lafarge Canada Bath CTS, and Novelis CTS.

There are two major thermal generating stations located in the region, injecting at the 500 kV and 230 kV voltage levels: Lennox GS (~2,150 MW) and Napanee GS (~1000 MW). In addition, there are over 400 MW of transmission-connected wind and solar generation facilities across the region. The 115 kV system between Dobbin TS and Frontenac TS is also connected via long 115 kV circuits to Barrett Chute GS located outside the region on the Madawaska River. Finally, there is a substantial amount of distribution-connected generation spread across the region.

3.2 Background

Regional electricity planning has been underway across the province for many years. In August 2013, the OEB formalized the regional planning process to ensure a consistent approach across all regions. To prioritize and manage the regional planning process, Ontario was organized into 21 regions, based on electricity infrastructure boundaries. In February 2015, Hydro One Transmission published the first NA report for the Peterborough-Kingston region. The scope of the report included a review of system capability, reliability assessment and asset sustainment timelines for the Peterborough-Kingston region. The NA concluded that there was no need at that time for further integrated planning for the region and that localized wires-only plans be developed for the needs identified. Since there was no need that required further regional coordination, the regional planning cycle concluded with the publication of a RIP report based on the NA.

This second regional planning cycle began with the NA report published by Hydro One in February 2020. The needs identified in the NA report form the basis of the analysis for this SA and are discussed in further detail in Section 3.3.

3.3 Needs Identified

Hydro One's NA identified a number of needs in the Peterborough-Kingston region based on a 10-year demand forecast and their most up-to-date asset sustainment plans. In addition to the NA, regional working group participants have considered the characteristics of the transmission and distribution systems in the region, the potential for regional coordination, and the opportunities for stakeholder and community engagement, in order to develop the following description of the regional needs.

Supply Capacity Needs

Table 1 describes the supply capacity needs that have been identified in the Peterborough-Kingston region.

Table 1. Supply Capacity Needs for Peterborough-Kingston

Facility	Need
Frontenac TS	• The 2018 summer peak loading on Frontenac TS was 113 MW, which is above its 10-day summer limited time rating (LTR) of 111 MW. Based on the NA load forecast, demand at Frontenac TS will exceed 125 MW by 2028. • Near-term load relief is required at Frontenac TS. • A long-term plan for supply to the Kingston area is also required.
Gardiner TS DESN 1	• Local planning for transfers between Gardiner TS dual element spot network (DESN) DESN 1 and DESN 2 was carried out in 2015, as recommended by the regional planning NA. • Based on the NA load forecast, demand at Gardiner TS DESN 1 will exceed its 10-day summer LTR by 2025.
Belleville TS	• The 2018 summer peak loading on Belleville TS was 159 MW, which is close to the 10-day summer LTR of 161 MW. • In addition to normal load growth in the area, Elexicon Energy Inc. has received approximately 30 MW of load connection inquiries. There is insufficient existing capacity at Belleville TS to supply potential future connections. • Preliminary studies also indicate that there may be voltage and/or thermal constraints on the transmission lines supplying Belleville TS.

115 kV system between Dobbin TS and Frontenac TS, including 230/115 kV transformers at Dobbin TS	• Preliminary studies indicate that there may be voltage and/or thermal constraints on 115 kV supply capacity, which affects supply to the Kingston area, Sidney TS, Port Hope TS, as well as other regional supply stations, and directly connected customers. Several LDCs are supplied by these circuits. • Sections of these lines were put into service between 65 and 90 years ago. • The Dobbin 230/115 kV transformers are legacy assets with limited 230 kV tap changer capability.

End-of-Life Needs

Table 2 lists the end-of-life needs in the Peterborough-Kingston region.

Table 2. Stations with Assets Approaching End-of-Life for Peterborough-Kingston

Equipment	Sustainment Timeline
Port Hope TS T3/T4 Transformer Replacement	2023
Havelock TS T1/T2 Transformer Replacement	2027
Belleville TS T2 Transformer Replacement	2021
Belleville TS T1 Transformer Replacement	2024

3.4 Analysis of Needs and Planning Approach

The regional participants have discussed the needs in the Peterborough-Kingston region and reviewed the region's geographical breakdown. They considered a number of factors before determining the recommended planning approach, including the potential for regional coordination and for a wide range of solutions - including conservation, generation, and new technologies, wires infrastructure and non-wires solutions.

Frontenac TS/Gardiner TS

Consistent with the NA recommendation, the near-term need for supply capacity at Frontenac TS and Gardiner TS will be managed by Hydro One Transmission by coordinating with Hydro One Distribution and Kingston Hydro to undertake distribution load transfers between Gardiner TS and Frontenac TS over the near term.

Integrated Regional Resource Planning

An Integrated Regional Resource Plan (IRRP) is recommended to address a number of needs due to:

- The potential for non-wires solutions to address the identified capacity needs;
- The potential to coordinate end-of-life needs;
- The potential for integrated solution(s) to address multiple needs

The IRRP will begin with a needs assessment, based on updated forecast data, to confirm the needs described above and identify any additional needs to be addressed. The draft Terms of Reference for the IRRP in Appendix B of this report provides more details on the scope and timeline of the IRRP.

Frontenac TS/Gardiner TS

The regional participants recognize the need to assess the long-term supply to Kingston and surrounding area, including coordination between Kingston Hydro and Hydro One for potential distribution load transfers between Frontenac TS, Gardiner TS DESN 1 and Gardiner TS DESN 2, in conjunction with planning for the 115 kV system that supplies Frontenac TS. The mid-term and long-term plan for supply to the Kingston and surrounding area will be part of the scope of integrated regional resource planning for the Peterborough-Kingston region.

Belleville TS

Demand at Belleville TS is forecast to approach the station planning limit. There may be an opportunity to consider both non-wires and wires alternatives for supply capacity through integrated planning. The potential need for increased supply at Belleville TS will also be considered in conjunction with potential upstream supply capacity limitations. The long-term plan for supply to Belleville will be part of the scope of integrated regional resource planning for the Peterborough-Kingston region.

115 kV System between Dobbin TS and Frontenac TS

The regional planning participants agree that the 115 kV system between Dobbin TS and Frontenac TS, including the 230/115 kV transformers at Dobbin TS, should be part of the scope of integrated regional resource planning due to the need for coordination between a number of customers supplied by these circuits, as well as the potential to coordinate with end-of-life planning for Port Hope TS and Dobbin 230/115 kV transformers and other aging assets. The long-term plan for the 115 kV system will be part of the scope of integrated regional resource planning for the Peterborough-Kingston region.

Port Hope TS Transformer Replacement

The need for end-of-life replacement of the Port Hope TS transformers will be part of the scope of integrated regional resource planning because Port Hope TS is supplied by the 115 kV system between Dobbin TS and Frontenac TS.

Additional End-of-Life Needs

In the NA, Hydro One also identified upcoming end-of-life replacement of Havelock TS transformers, and Belleville TS transformers. Based on the NA load forecast, there is limited need or opportunity to reconfigure or resize the facilities, therefore no regional coordination is required. Hydro One will coordinate like-for-like end-of-life replacement with the affected LDCs.

Table 3, below lists each of the needs and the recommended regional planning process to address each.

Table 3. Summary of the needs and the recommended regional planning process to address each need

Peterborough-Kingston Region		
Facility	**Need**	**Planning Process**
Frontenac TS/Gardiner TS	Long-term supply capacity	IRRP
Belleville TS	Transmission line and transformation supply capacity	IRRP
115 kV system between Dobbin TS and Frontenac TS including 230/115 kV transformers at Dobbin TS	Supply capacity	IRRP
Port Hope TS T3/T4 Transformer Replacement	End-of-life	IRRP
Havelock TS T1/T2 transformer replacement	End-of-life	No regional coordination required. Hydro One will coordinate implementation with affected LDCs.
Belleville TS T1/T2 transformer replacement	End-of-life	No regional coordination required. Hydro One will coordinate implementation with affected LDCs.

Related Bulk Transmission Planning Study

The IESO is currently undertaking a bulk transmission planning study that touches on the Peterborough area. The IESO will inform the regional planning Working Group if opportunities for integration with the Peterborough-Kingston IRRP are identified through the course of bulk planning activities.

4 Conclusion and Next Steps

An IRRP is recommended for the Peterborough-Kingston region. The scope of the IRRP will include:

- Supply capacity requirements in the Kingston area (Frontenac TS and Gardiner TS)
- Supply capacity requirements in the Belleville area (Belleville TS);
- Supply capacity requirements on the 115 kV transmission system between Dobbin TS and Frontenac TS, including consideration of sustainment options for aging assets.

As indicated in the NA, Hydro One Transmission will coordinate with Kingston Hydro and Hydro One Distribution to confirm a plan for near-term distribution load transfers between Frontenac TS and Gardiner TS.

The draft Terms of Reference for the Peterborough-Kingston IRRP are attached in Appendix B.

List of Abbreviations

CDM	Conservation and Demand Management
DESN	Dual Element Spot Network
DG	Distributed Generation
FIT	Feed-in Tariff
IESO	Independent Electricity System Operator
IRRP	Integrated Regional Resource Plan
kV	Kilovolt
LAC	Local Advisory Committee
LDC	Local Distribution Company
MW	Megawatt
NA	Needs Assessment
NERC	North American Electric Reliability Corporation
NPCC	Northeast Power Coordinating Council
OEB	Ontario Energy Board
ORTAC	Ontario Resource and Transmission Assessment Criteria
RIP	Regional Infrastructure Plan
RPP	Regional Planning Process
SA	Scoping Assessment
TS	Transformer Station

Appendix A: Selecting a Regional Planning Approach

Needs identified through the Needs Assessment (NA) will be reviewed during the Scoping Assessment to determine whether a Local Plan (LP), Regional Infrastructure Plan (RIP), or Integrated Regional Resource Plan (IRRP) regional planning approach is more appropriate. Where multiple sub-regions are identified, each will be considered individually. It is possible that a combination of LP, RIP and IRRP planning approaches could be selected in different sub-regions, although if the need for a wires-type solution is urgent, it will typically trigger a hand-off letter instead to initiate the work and required activities associated with the recommended solution.

The three potential planning outcomes are designed to carry out different functions, and the selection of which one(s) to implement should be made based on the unique needs and circumstances in each area. The criteria used to select the regional planning approach within each sub-region are consistent with the principles laid out in the PPWG Report to the Board[1], and are discussed in this document to ensure consistency and efficiency throughout the Scoping Assessment.

IRRPs are comprehensive undertakings that consider a wide range of potential solutions to determine the optimal mix of resources to meet the needs of an area for the next 20 years, including consideration of conservation, generation, new technologies, and wires infrastructure. RIPs focus instead on identifying and assessing the specific wires alternatives and recommend the preferred wires solution for an area and are thus narrower in scope. LPs have the narrowest scope, and only consider simple wires solutions that do not require further coordinated planning. An LP process is recommended when needs:

a) Are local in nature (only affecting one LDC or customer);
b) Require limited investments of wires (transmission or distribution) solutions;
c) Do not require upstream transmission investments;
d) Do not require plan level stakeholder engagement; and
e) Do not require other approvals such as a Leave to Construct (S92) application or Environmental Approval.

If it is determined that coordinated planning is required to address identified needs, either a RIP or an IRRP may be initiated. A series of criteria have been developed to assist in determining which planning approach is the most appropriate based on the identified needs.

[1] http://www.ontarioenergyboard.ca/OEB/_Documents/EB-2011-0043/PPWG_Regional_Planning_Report_to_the_Board_App.pdf

These are discussed in Section **Error! Reference source not found.**, below. In general, an IRRP is i nitiated:

- Wherever a non-wires measure has the potential to meet or significantly defer the needs identified by the transmitter during the Needs Assessment;
- Community or stakeholder engagement is required; or
- The planning process or outcome has the potential to impact bulk system facilities.

If it is determined that the only feasible measures involve new/upgraded transmission and/or distribution infrastructure, with no requirement for engagement or anticipated impact on bulk systems, a RIP will be selected instead.

Wires-type transmission/distribution infrastructure solutions refer, but are not limited, to:

- Transmission lines
- Transformer/ switching stations
- Sectionalizing devices including breakers and switches
- Reactors or compensators
- Distribution system assets

Additional solutions, including conservation and demand management, generation, and other electricity initiatives can also play a significant role in addressing needs. Because these solutions are non-wires alternatives, they must be studied through an IRRP process.

Determining the feasibility of non-wires alternatives to meet identified needs should also consider issues such as timelines for implementing solutions. For instance, if a need has been identified as immediate or near-term, non-wires solutions that rely on lengthy development and roll-out periods may not be feasible.

Appendix B: Peterborough-Kingston IRRP Draft Terms of Reference

Peterborough-Kingston is one of the 21 electricity planning regions in Ontario as identified through the Ontario Energy Board's (OEB) formalized Regional Planning Process.

These Terms of Reference establish the objectives, scope, key assumptions, roles and responsibilities, activities, deliverables and timelines for the Peterborough-Kingston Integrated Regional Resource Plan ("IRRP").

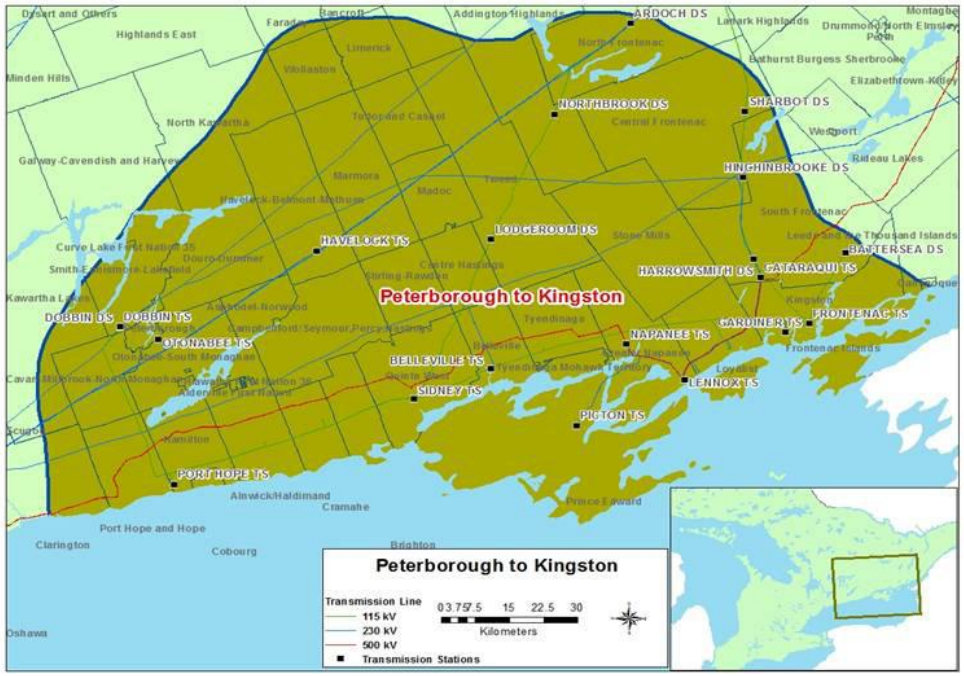
1. Background

a. Description of the Region

The Peterborough-Kingston region is located in eastern Ontario and includes Frontenac County, Hastings County, Northumberland County, Peterborough County, Prince Edward County, and related municipalities. Peterborough and Kingston are the two largest population centres in the region. The region also comprises several Indigenous communities including Kawartha Nishnawbe, Mohawks of the Bay of Quinte, Curve Lake First Nation, and Alderville First Nation.

For electricity planning purposes, the planning region is defined by electricity infrastructure boundaries, not municipal boundaries. The electricity infrastructure supplying the Peterborough-Kingston region is shown in Figure A1. Hydro One owns the transmission assets in the region.

Figure A0. Electricity Infrastructure in the Peterborough-Kingston Region



As per Hydro One's Needs Assessment, this area has net extreme weather winter peak demand of approximately 1,175 MW, which occurred in the year 2018. Peak demand in this area is expected to grow to approximately 1,260 MW by the year 2028. Furthermore, the net extreme weather summer peak demand was approximately 1,110 MW in the year 2018. This is expected to grow to approximately 1,210 MW by the year 2028. This means a growth rate of less than 1 per cent per year is forecasted.

b. Electrical System of the Peterborough- Kingston area

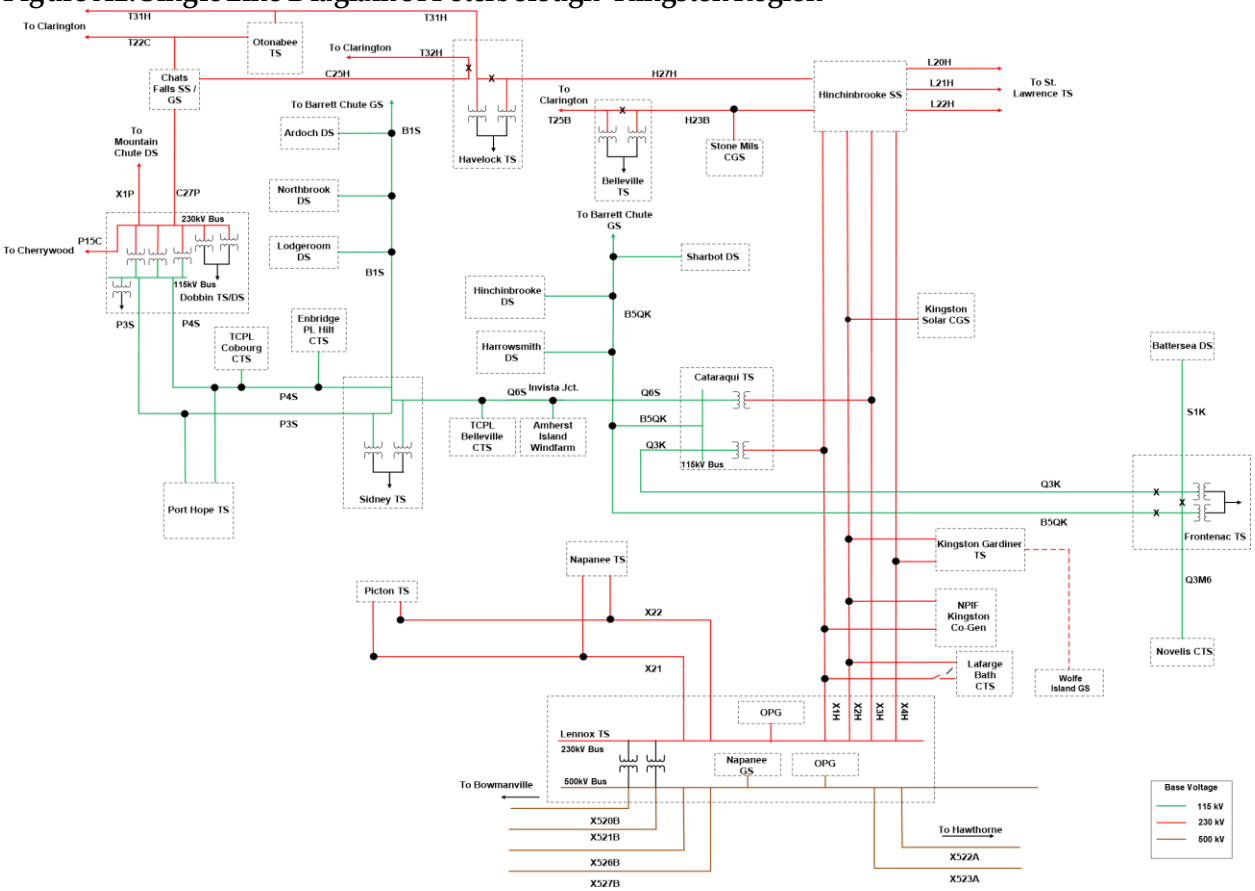
Electrical supply to the Peterborough- Kingston Region is provided through a network of 230 kV and 115 kV circuits supplied by 500/230 kV autotransformers at Lennox Transformer Station (TS) and 230/115 kV autotransformers at Cataraqui TS and Dobbin TS.

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

- Lennox TS is the major transmission station that connects the 500 kV network to the 230 kV system via two 500/230 kV autotransformers.
- Cataraqui TS and Dobbin TS are the transmission stations that connect the 230 kV network to the 115 kV system via 230/115 kV autotransformers.

- Ten step-down transformer stations supply the Peterborough- Kingston load: Dobbin TS, Port Hope TS, Sidney TS, Picton TS, Otonabee TS, Havelock TS, Belleville TS, Napanee TS, Gardiner TS, and Frontenac TS.
- There are also eight HVDS that supply load in the region: Dobbin DS, Ardoch DS, Northbrook DS, Lodgeroom DS, Hinchinbrooke DS, Harrowsmith DS, Sharbot DS, and Battersea DS.
- Five Customer Transformer Stations (CTS) are supplied in the region: TransCanada Pipelines Cobourg CTS, TransCanada Pipelines Belleville CTS, Enbridge Pipelines Hilton CTS, Lafarge Canada Bath CTS, and Novelis CTS.
- There are seven existing transmission-connected generating stations in the region as follows:
    - Lennox GS is a 2,000 MW thermal generating station connected to Lennox TS
    - NPIF Kingston GS is a 130 MW gas-fired cogeneration facility that connects to 230 kV circuits X1H and X2H near Lennox TS
    - Wolfe Island GS is a 198 MW wind farm connected to circuit X4H near Gardiner TS
    - Napanee GS is a 1000 MW gas-fired plant connected to Lennox TS at the 500 kV system
    - Kingston Solar CGS is a 100 MW solar generation facility connected to 230 kV circuit X2H
    - Stone Mills CGS is a 60 MW solar generation facility connected to 230 kV circuit H23B
    - Amherst Island CGS is a 76 MW wind farm connected to 115kV circuit Q6S

Figure A2: Single Line Diagram of Peterborough- Kingston Region



2. Objectives

The Peterborough- Kingston Region IRRP will assess the adequacy of electricity supply to customers in the region and will develop a set of recommended actions to maintain reliability of supply to the region over the next 20 years (2020-2040). Specifically, this IRRP will:

- Assess the adequacy of electricity supply to customers in the Peterborough- Kingston region over the next 20 years
- Determine whether there is a need to initiate development work or to fully commit infrastructure investments in this planning cycle
- Assess potential risks and uncertainties over the longer term and identify near-term actions to manage/mitigate these risks, where applicable
- Develop an implementation plan that maintains flexibility in order to accommodate changes in key assumptions over time. The implementation plan should identify actions

for near-term needs, preparation work for mid-term needs, and the planning direction for long-term needs.

The outcomes from the Peterborough- Kingston Region IRRP should help inform the LDCs' rate filing.

3. Scope

This IRRP will develop and recommend an integrated plan to meet the needs of the Peterborough- Kingston region. This plan will be a joint initiative involving the participants of a Working Group (see section 5). It will also incorporate input from community engagement activities. The plan will assess all the capacity, restoration and sustainment needs in the area.

The IRRP process will comprise the following activities:

- Creation of an updated 20-year demand forecast for the Peterborough-Kingston region
- Information gathering, as described in section 4 below
- For confirmed needs, assessment of options. Options are evaluated using a number of decision-making criteria that include, but not limited to, technical feasibility, economics, reliability performance, and environmental and social factors. The analysis of options will be divided into groupings based on the priority/timing of the needs, any known lead time information, and the depth of analysis required.
    - The options and recommendation plan will integrate forecast electricity demand growth, conservation and demand management (CDM) in the area with transmission and distribution system capability, relevant community plans, other bulk system developments, and distributed energy resources (DER) uptake
- Development of the long-term recommendations and the implementation plan
- Completion of the IRRP report documenting the near-, mid-, and long-term needs and recommendations

4. Data and Assumptions

The plan will consider the following data and assumptions:

- Demand data
    - Historical peak demand information for the region. The region's coincident demand will be forecasted and will include station-level non-coincident demand where an potential reliability problem is expected to occur.
    - Historical weather correction, for median and extreme conditions
    - Gross peak demand forecast scenarios by region, TS, etc.
    - Peak demand data including transmission-connected customers

    - Identified potential future load customers

- Conservation and Demand Management (CDM) opportunities
    - LDC CDM plans
    - Incorporation of verified LDC results and progression towards OEB targets, and any other CDM programs/opportunities in the area
    - Long-term conservation forecast for LDC customers
    - Conservation potential studies, if available
    - Load segmentation data for each TS based on customer type (residential, commercial, industrial etc.)

- Local resources
    - Existing local generation, including distributed generation ("DG"), district energy, customer-based generation, Non-Utility Generators and hydroelectric facilities as applicable
    - Existing or committed renewable generation from Feed-in-Tariff ("FIT") and non-FIT procurements
    - Future district energy plans, combined heat and power, energy storage, or other generation proposals

- Relevant local plans, as applicable
    - LDC distribution system plans
    - Community energy plans and municipal energy plans
    - Municipal growth plans
    - Any transit plans impacting electricity use

- Criteria, codes and other requirements
    - Ontario Resource and Transmission Assessment Criteria
        - Supply capability
        - Load security
        - Load restoration requirements
    - NERC and NPCC reliability criteria, as applicable
    - OEB Transmission System Code
    - OEB Distribution System Code
    - Reliability considerations, such as the frequency and duration of interruptions to customers
    - Other applicable requirements

- Existing system capability
    - Transmission line ratings as per transmitter records
    - System capability as per current IESO PSS/E base cases
    - Transformer station ratings as per asset owner

- Load transfer capability for restoration during transmission system outages and/or as options for any transmission level capacity needs
- Technical and operating characteristics of local generation

- End-of-life asset considerations/sustainment plans and expected-service-life information
  - Transmission assets
  - Distribution assets

- Other considerations, as applicable

5. Technical Working Group

The following are the local distribution companies (LDCs) in the Peterborough- Kingston Region:

- Elexicon Energy Inc.
- Kingston Hydro
- Peterborough Distribution Inc.
- Lakefront Utilities Inc.
- Eastern Ontario Power Inc.
- Hydro One Networks Inc. (Distribution)

The Technical Working Group (Working Group) consists of the LDCs stated above as well as the Independent Electricity System Operator (IESO) and Hydro One Transmission.

Authority and Funding

Each entity involved in the study will be responsible for complying with regulatory requirements as applicable to the actions/tasks assigned to that entity under the implementation plan resulting from this IRRP. For the duration of the study process, each participant is responsible for its own funding.

6. Engagement

Integrating early and sustained engagement with communities and stakeholders is a key component in the IRRP planning process.

The first step in engagement will consist of the development of a stakeholder engagement plan, which will be made available for comment before it is finalized. Below is the scope of community and stakeholder engagement to be considered for this IRRP:

◎ Local electricity needs and considerations

- Status and key assumptions from community energy planning (e.g., energy intensity, electric vehicles and fuel-switching scenarios)
- Status and key assumptions in municipal growth plans and local economic developments (housing, population growth, commercial and industrial development)
- Impact of climate change in the region
- Long-term land use and infrastructure corridor plans, if any
- Local interests in developing and implementing community-based energy solutions and factors that could facilitate or hinder the implementation of community-based energy solutions. For example:
  - Existing or planned pilot projects
  - Available local funding to support these pilots
  - Local policy/programs that enable/hinder the development of these projects
  - Support from local utilities, community groups and government
  - Land use impact and considerations

The Technical Working Group is committed to conducting plan-level engagement throughout the development of the Peterborough-Kingston IRRP.

7. Activities, Timelines and Primary Accountabilities

Table A-1 Summary of IRRP Timelines and Activities

	Activity	Lead Responsibility	Deliverable(s)	Start – End Date
1	**Commence IRRP process** - Prepare Terms of Reference considering stakeholder input - Kick-off meeting with working group members	IESO	- Final Terms of Reference	May-June 2020
2	**Develop the planning forecast for the region**			
	- Establish historical peak demand information	IESO	- Long-term planning forecast scenarios	May – August 2020
	- Establish historical weather correction, median and extreme conditions	IESO		
	- Establish gross peak demand forecast and if applicable/need be, high/low growth scenarios	LDCs		
	- Establish existing, committed and potential DG	LDCs		
	- Establish near- and long-term conservation forecasts	IESO		

	Activity	Lead Responsibility	Deliverable(s)	Start – End Date
	- Develop planning forecast scenarios - including the impacts of CDM, DG and extreme weather conditions	IESO		
3	**Provide information on load transfer capabilities under normal and emergency conditions – for the purpose of analyzing transmission system needs and identifying options for addressing needs**	LDCs	- Load transfer capabilities under normal and emergency conditions	May - August 2020
4	**Complete system studies to identify needs over a 20-year period** - Obtain PSS/E base case, include bulk system assumptions as identified in the key assumptions - Apply reliability criteria as defined in ORTAC to demand forecast scenarios - Confirm and refine the need(s) and timing/load levels	IESO, Hydro One Transmission	- Summary of needs based on demand forecast scenarios for the 20-year planning horizon	September - December 2020
5	**Develop options and alternatives**			
	Develop conservation options	IESO and LDCs	- Develop flexible planning options for forecast scenarios - An integrated long-term plan for cost-effective, reliable supply to the region.	January - March 2021
	Develop local generation options	IESO and LDCs		
	Develop transmission (see Action 7 below) and distribution options	Hydro One and LDCs		
	Develop options involving other electricity initiatives (e.g., smart grid, storage)	IESO/ LDCs with support as needed		
	Develop a portfolio of integrated alternatives	All		
	Technical comparison and evaluation	All		
6	**Plan and undertake community and stakeholder engagement**			
	- Early engagement with local municipalities and Indigenous communities within study area, First Nation communities that may have an interest in the study area, and the Métis Nation of Ontario	All	- Community and Stakeholder Engagement Plan - Input from local communities	Q4 2020

Activity		Lead Responsibility	Deliverable(s)	Start – End Date
	- Develop communications materials	All		Q1 2021
	- Undertake community and stakeholder engagement	All		
	- Summarize input and incorporate feedback	All		
7	**Develop long-term recommendations and implementation plan based on community and stakeholder input**	IESO	- Implementation plan - Monitoring activities and identification of decision triggers - Hand-off letters - Procedures for annual review	April-June 2021
8a	**Prepare the IRRP report detailing the recommended near-, medium- and long-term plan for approval by all parties**	IESO	- IRRP report	July-September 2021
8b	**Review and publish IRRP report**	IESO	-	September-November 2021