



# Greater Ottawa Region Scoping Assessment Outcome Report

## DRAFT FOR REVIEW

February 8, 2023



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# 1. Introduction

This Scoping Assessment Outcome Report is part of the Ontario Energy Board's (OEB or Board) endorsed Regional Planning Process.

The new cycle of the regional planning for the Greater Ottawa region started on August 23, 2022. The Needs Assessment<sup>1</sup> (NA) is the first step in the regional planning process and was carried out by the Greater Ottawa Technical Working Group (TWG) and led by Hydro One Networks Inc. (Hydro One). The report, which was published on December 20th, 2022, provided updates on previously identified needs, identified a number of new asset renewal and supply capacity needs, and recommended that further regional coordination is required. Results from the NA were used as an input into the Scoping Assessment (SA) to determine the nature of the planning process required.

During the SA, the TWG 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) led by the transmitter – which considers more straightforward 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 Scoping Assessment report:

- Lists the needs requiring more comprehensive planning, as identified in the Needs Assessment report;
- Reassesses the areas that need to be studied and the geographic grouping of the needs;
- Determines the appropriate regional planning approach and scope for each sub-region (when applicable) where a need more comprehensive planning is identified;
- Establishes a terms of reference for an IRRP if an IRRP is required; and
- Establishes the composition of the TWG for each sub-region recommended for an IRRP (when applicable).

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<sup>1</sup> The Greater Ottawa Region Needs Assessment report is available on the Hydro One website ([link](#))



## 2. Technical Working Group

This report was prepared by the Greater Ottawa Region TWG, led by the IESO. The report presents the results of the assessment based on information provided by Hydro One, the Local Distribution Companies (LDC) and the Independent Electricity System Operator (IESO). Participants of the TWG include:

- Hydro 2000
- Hydro Hawkesbury
- Hydro One Networks (Distribution)
- Hydro One Networks (Lead Transmitter)
- Hydro Ottawa Limited
- Independent Electricity System Operator
- Ottawa River Power Corporation
- Renfrew Hydro

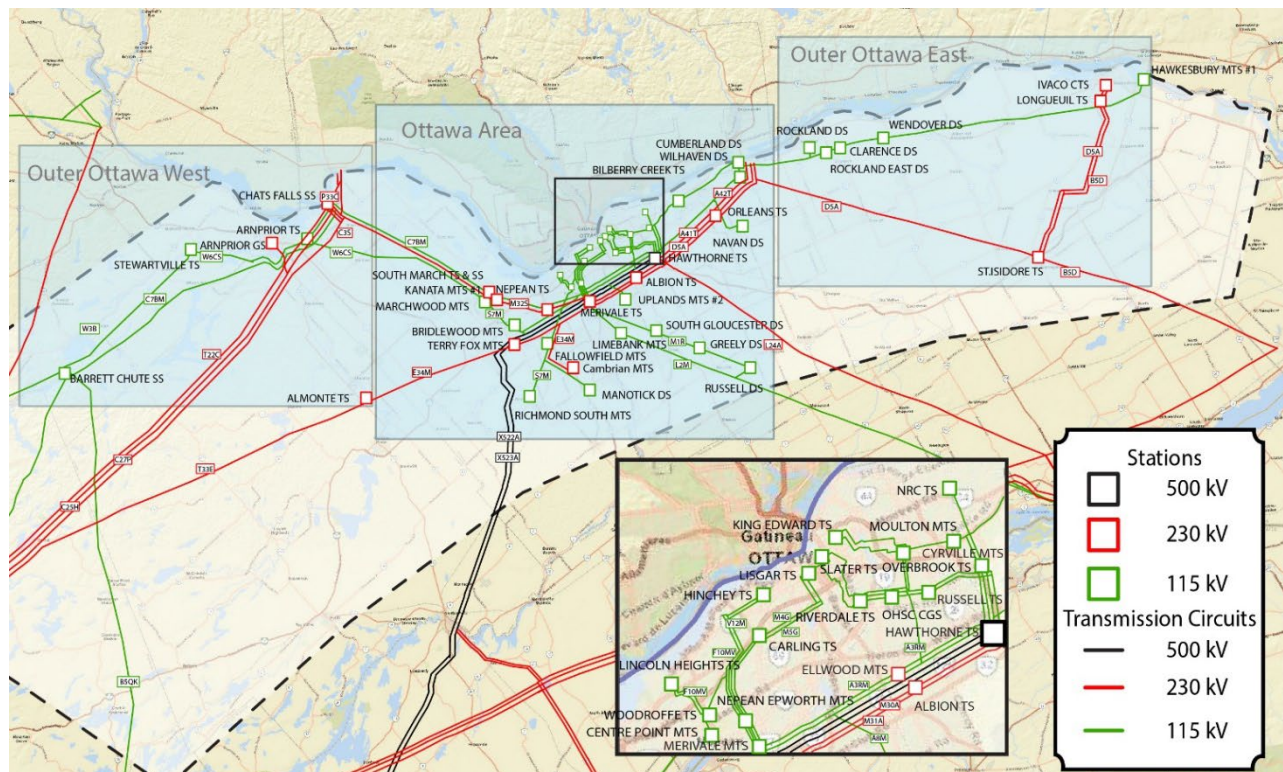
# 3. Categories of Needs, Analysis, and Results

## 3.1 Overview of the Region

The Greater Ottawa Region is located in eastern Ontario and covers the municipalities bordering the Ottawa River from Stewartville in the west to Hawkesbury in the east and north of Highway 43. At the center of this region is the City of Ottawa. The Greater Ottawa Region lies within the traditional territory of the Algonquin peoples, including the Algonquins of Pikwakanagan and several other Algonquin communities. Ottawa is also home to the MNO Ottawa Region Métis Council. Near Ottawa are the Mohawks of Akwesasne. Ottawa, along with much of southern Ontario, was once the home of the Huron Wendat who are now located in Wendake, Quebec.

This region includes all or part of the following Counties and Districts: the City of Ottawa and Clarence-Rockland, the town of Arnprior, Carleton Place, Mississippi Mills, and townships of East Hawkesbury, Champlain, Alfred and Plantagenet, Russell, Beckwith, Drummond/North Elmsley, Tay Valley, North Frontenac, Lanark Highlands, McNab/Braeside, Greater Madawaska and the municipality of The Nation. For electricity planning purposes, the planning region is defined by electricity infrastructure boundaries, not municipal boundaries.

The electricity infrastructure supplying the Greater Ottawa Region is shown in **Figure 1**. Hydro One is the transmission asset owner in the Region. The region is divided into three sub-regions: Outer Ottawa West, Ottawa Area and Outer Ottawa East.



**Figure 1. Electricity System in the Greater Ottawa Region**

The Outer Ottawa West Sub-region is served by one (1) 230kV and two (2) 115kV step-down transformer stations. Hydro One Distribution is the main LDC in the Outer Ottawa West sub-region with two additional embedded LDCs, Ottawa River Power Corp. and Renfrew Hydro, served from Hydro One's feeders at Almonte TS and Stewartville TS. The area includes a number of transmission connected hydro-electric generation stations in Barrett Chute GS, Chats Falls GS, and Stewartville GS with a combined peak generation capacity of approximately 450 MW.

The Ottawa Area Sub-region comprises primarily of the City of Ottawa. It is supplied by two (2) 230/115 kV autotransformer stations (Hawthorne TS and Merivale TS), eight (8) 230 kV and thirty-three (33) 115 kV transformer stations stepping down to a lower voltage. There is one local transmission connected generator in the area, the 74 MW Ottawa Health Sciences Center cogeneration plant located near the downtown area and connected to the 115 kV network. Hydro Ottawa is the main LDC that serves the electricity demand for the City of Ottawa. Hydro One Distribution supplies load in the outlying areas of the sub-region. Both Hydro Ottawa and Hydro One Distribution receive power at the stepdown transformer stations and distribute it to end users, including industrial, commercial, and residential customers.

The Outer Ottawa East Sub-region is served by three (3) 230kV and five (5) 115kV step-down transformer stations. There are three LDCs, Hydro One Distribution, Hydro Hawkesbury, and Hydro 2000, in the Outer Ottawa East Sub-region. Hydro 2000 is an embedded LDC that supplies its customers from Longueuil TS via Hydro One Distribution's 44kV feeders. This area also includes a transmission-connected industrial customer in L'Orignal, Ontario.

## 3.2 Previous Cycle of Regional Planning in Greater Ottawa

The previous cycle of regional planning for the Greater Ottawa region was carried out during 2018-2020. After reviewing the identified needs, the TWG decided that a IRRP was required for the Ottawa Sub-region as the identified needs required to be assessed 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. The TWG further determined that the needs identified for Outer Ottawa East and Outer Ottawa West would not require an IRRP and instead would be studied through local planning.

The Ottawa Area Sub-region IRRP was published in March 2020. The IRRP used a 20-year demand forecast and made recommendations to monitor long-term needs in the region while providing clear direction on actions required in the near-term.

Recommendations made in the IRRP are summarized in the sections below:

### **Kanata-Stittsville**

- Implement the North Kanata Retrofit Top-Up Program and the North Kanata Smart Thermostat Program, targeted commercial and residential energy efficiency programs – The IESO posted a Request for Proposals for targeted energy efficiency programs in the Ottawa region as part of the Local Initiatives Program<sup>2</sup> under the 2021-2024 CDM Framework. The Request for Proposals, which sought proposals for programs that will deliver approximately 7 MW of peak demand savings in the Kanata-Stittsville area and an additional 7 MW in outside of the area, closed on February 1, 2023. Energy efficiency measures delivered under this program are expected to be installed between 2023 and 2025.
- Improve distribution load transfer capability at the heavily loaded stations Marchwood MTS and Kanata MTS – Ongoing

### **Southeast Ottawa**

- Plan and seek approval for a new 230 kV connected supply station in southeast Ottawa – planning for the new station is underway targeting to be placed in-service in year 2026

### **Central Ottawa**

- Replace transformers T2 and T3 at Slater TS, which are approaching their end-of-life, with larger transformers, approximately 100 MVA, as was done for the recent replacement of T1 – work underway, expected completion in 2024
- Replace transformers T1 and T2 at Albion TS, which are approaching their end-of-life, with similar size transformers – planning underway with an expected completion in 2031-2033

Replace transformers T1 and T2 at Lincoln Heights, which are approaching their end-of-life, with similar size transformers – work underway, expected completion in 2024

### **Orleans**

- Proceed with the like-for-like refurbishment of Bilberry Creek TS, which is approaching its end-of-life, and expand the station to accommodate two additional breaker positions to supply Hydro Ottawa customers – Not proceeding.

In mid-2022, Hydro Ottawa indicated to the TWG that the forecasted demand in the Ottawa Area Sub-region is expected to increase significantly from the demand forecast developed during the previous cycle of regional planning. Further, this increase is expected to have a more profound impact to the loads at the 115 kV connected supply stations. As a result, the TWG decided to re-evaluate the decision to refurbish Bilberry Creek TS and instead re-consider alternatives examined during the 2020 Ottawa Area Sub-region IRRP that can better address both the EOL needs at Bilberry Creek TS as well as addressing broader supply capacity needs on the Ottawa 115 kV System.

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<sup>2</sup> More information about the Local Initiatives Program is available on the IESO's Save on Energy website ([link](#))



The IESO, Hydro Ottawa and Hydro One are reviewing an alternative that would result in the decommissioning of the EOL 115 kV connected Bilberry Creek TS and transferring the loads to a new 230 kV connected supply station. The new station would be located south of Bilberry Creek TS and towards the existing D5A transmission line. In addition, the existing Orleans TS will be upgraded and will be able to provide additional supply capacity to accommodate future demand growth. More information regarding the Bilberry Creek and Orleans area work can be found in the 2022 Greater Ottawa Region NA<sup>3</sup>. In addition to providing incremental supply capacity to the Orleans area, these changes will also result in approximately 120 MW of load being transferred from the 115 kV system to the 230 kV system, alleviating some of the capacity issues on the 230-115 kV auto-transformers at Merivale TS and Hawthorne TS.

## Regional 115 kV System

- Replacing Merivale T22 with one that is equivalent to T21 – planning underway with an expected completion in 2026-2028
- IESO to conduct a separate study of the Ottawa 115 kV system – study in progress

Study work on the Ottawa 115 kV system is still in progress. Preliminary results indicate that a third 230-115 kV auto-transformer is needed to mitigate overloading of the existing auto-transformers T21 and T22 at Merivale TS. Work on the study will need to continue and reflect the changes in the Orleans area and updated demand forecasts as part of the current cycle of regional planning for Greater Ottawa.

## 3.3 Transmission Needs

The Greater Ottawa NA report identified a number of transmission system issues that need to be addressed during this cycle of regional planning using a 10-year station level demand forecast developed by the LDCs, updated asset condition information, as well as the conservation and demand management (CDM) and distributed generation (DG) forecast provided by the IESO. The transmission needs are listed in **Table 1** below lists these regional needs and their timing. Their location is shown in Figure 3-3.

**Table 1. Newly Identified Needs to be Addressed in this Planning Cycle**

Need #	Need	Timing	Need Description
1	South March TS: T1/T2 EOL	2030-32	Transformers are nearing EOL and requires replacement in the medium-term
2	Lisgar TS: T1 EOL	2031-33	Transformers are nearing EOL and requires replacement in the medium-term

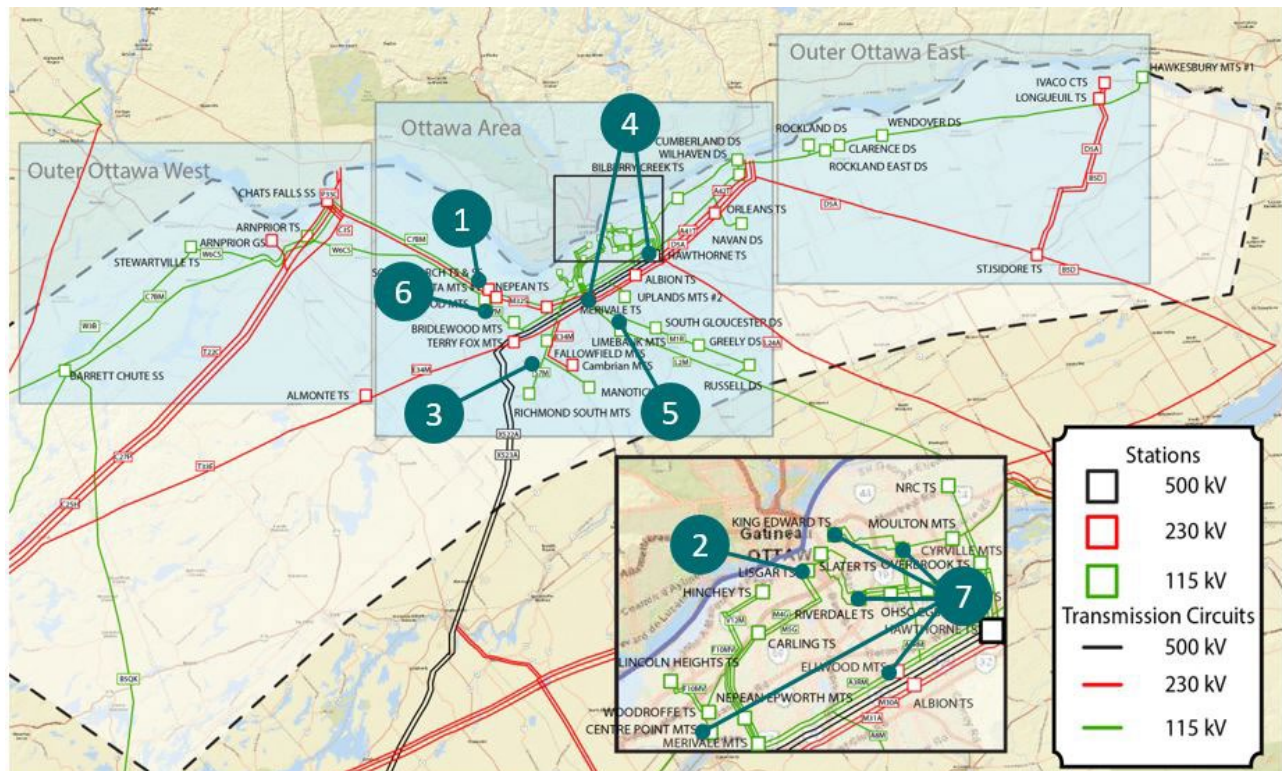
<sup>3</sup> The 2022 Greater Ottawa Region Needs Assessment report is available on Hydro One's website ([link](#)).



<b>Need #</b>	<b>Need</b>	<b>Timing</b>	<b>Need Description</b>
3	S7M EOL	To be confirmed	Two sections of 115 kV circuit S7M are nearing EOL and requires replacement over the near-term
4	Regional 115 kV System Capacity	Beyond 10 year forecast	Auto-transformers at Hawthorne are approaching their long-term emergency ratings and may become overloaded beyond the 10 year forecast period
5	L2M Supply Capacity	2029-2031	Circuit becomes overloaded, additional supply capacity needed
6	Kanata-Stitsville Area Capacity	2027-2031	The transformer stations supplying the Kanata-Stitsville area which include Kanata MTS, Marchwood MTS, and Terry Fox MTS are overloaded, additional supply capacity needed
7	King Edward TS, Riverdale TS, Ellwood MTS, Cyrville MTS, Centrepont MTS Station Capacity	2022-2029	Various transformer stations across Ottawa becomes overloaded, additional supply capacity needed
8	Voltage on Circuit 79M1	2022	The voltage on circuit 79M1, which supply Rockland DS, Rockland East DS, Clarence DS, Wendover DS, and Hawkesbury MTS, approaches the low voltage limit post-contingency (loss of circuit A2) <sup>4</sup> .

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<sup>4</sup> The TWG has been monitoring the load growth in the area for the past two cycles of regional planning. As the demand has stayed relatively consistent, no transmission improvements have been planned to address the low voltages on 79M1. Further, the transmission system changes in the Orleans area discussed in section 3.2 mitigates the voltage issues on 79M1 by reducing the loading on the supply circuit.



**Figure 2. Geographic Location of Needs Identified in the Needs Assessment**

### 3.4 Analysis of Needs

The TWG has outlined the needs in the Greater Ottawa region and potential planning approaches to address them.

#### **South March TS, Lisgar TS – Asset Renewal Need**

South March TS is located in the Kanata-Stittsville area and is supplied from 230kV circuits M32S and C3S. The station has two 230kV/44kV, 50/67/83MVA transformers that were placed in-service in 1971. The transformers are approaching EOL and would need to be replaced around 2030-2032. Additionally, based on the Needs Assessments' non-coincident load forecast, the station's 10-day LTR of 116.2 MW will be exceeded by 2026.

Lisgar TS is located in the City of Ottawa and is supplied by two 115 kV circuits, M4G and M5G. The station has two 115kV/13.8kV, 45/60/75MVA transformers, which were placed in-service in 1974. Transformer T2 was replaced in 2011 due to a failure. Based on asset condition, T1 is also in need of replacement by 2031-2033. Additionally, the 10-day LTR of the station is 74.7MW and based on a non-coincident forecast, this capacity is reached in 2026.

The TWG recommends that the capacity need for the area be further reviewed in an IRRP to examine potential opportunities for upsizing transformers when they reach EOL or addressing the overloads using non-wires or energy efficiency.

## **S7M – Asset Renewal Need**

The 115 kV circuit S7M supplies a number of stations in west Ottawa. Sections of S7M are nearing EOL and they are planned for refurbishment in 2024. Additionally, potential load growth has been identified in the area that may reconfiguring or upgrading the transmission supply in the area.

The TWG recommends that the transmission supply for the area be further reviewed in an IRRP to examine potential opportunities for coordinating the EOL needs and supply capacity requirements in the area.

## **Regional 115 kV System – Capacity Need**

The Ottawa 115 kV system supplies approximately 60% of the total Ottawa demand. While the previous recommendation to replace EOL auto-transformer T22 at Merivale TS, and the recent development to reconfigure the supply in the Orleans area will help defer needs in the on the 115 kV system to beyond the 10-year forecast period, additional improvements to the Ottawa 115 kV system will likely be required over the long-term (year 10-20). This may occur earlier under a high growth electrification scenario.

The TWG recommends that the regional 115 kV system be further reviewed in an IRRP to develop a long-term plan for the system. Further improvements to the regional 115 kV system may require improvements with significantly longer lead times to develop (i.e. new transmission lines or new resources).

## **L2M – Capacity Need**

L2M is a 115 kV circuit supplying two stations in southern Ottawa: Limebank MTS and Marionville DS. The two circuits are normally radially supplied by L2M from Merivale TS. Additionally, the circuit extends to the St. Lawrence TS 115 kV network via a normally opened point at Chesterville TS, meaning transfers between the Merivale L2M network and the St. Lawrence L2M network are possible. The circuit is thermally limited to 480A (approximately 86 MW).

In the previous cycle of regional planning, the circuit was identified as reaching its thermal limit in 2029, and several options were considered to address this capacity need. The TWG recommended to wait for the conclusion of the Gatineau Corridor EOL Study and to re-evaluate the L2M capacity need during the next cycle of regional planning since potential supply changes may be recommended by that study. The Gatineau Corridor EOL Study Report was published in December 2022<sup>5</sup> and no supply changes for the area were recommended.

The TWG recommends that the L2M capacity need be further reviewed in an IRRP to examine opportunities for integrated solutions involving both wires and non-wires solutions.

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<sup>5</sup> The Gatineau Corridor EOL Study report is available on the IESO website ([link](#)).

## **Kanata-Stittsville – Capacity Need**

The Kanata-Stittsville area has experienced significant load growth in recent years. The area is primarily supplied by Kanata MTS, Marchwood MTS, and Terry Fox MTS. Based on a non-coincident forecast, these three stations are expected to be loaded above their long-term emergency ratings for the entire study period. Each station is roughly 10MW overloaded in 2022, increasing to 47MW by 2031.

This area was identified as a high load growth area with possible capacity needs in the previous cycle of regional planning. The TWG recommended to wait for the conclusion of the Gatineau Corridor EOL Study and to re-evaluate the Kanata-Stittsville capacity need during the next cycle of regional planning since potential supply changes may be recommended by that study. As noted earlier, the Gatineau Corridor EOL Study was completed in December 2022, and similarly no supply changes for the Kanata-Stittsville area were recommended. However, the study did recommend that up to 230 MW of energy efficiency measures be pursued over the 20-year forecast period.

The TWG recommends that the Kanata-Stittsville capacity need be further reviewed in an IRRP to further examine the timing of the need due to effects of the recommended energy efficiency measures, and to examine opportunities for integrated solutions involving both wires and non-wires solutions.

## **Various Stations – Capacity Need**

Based on a non-coincident forecast, King Edward TS, Riverdale TS, Ellwood MTS, Cyrville MTS, and Centrepont MTS are all expected to be loaded above their long-term emergency ratings during the 10-year forecast period.

The TWG recommends that the capacity needs for the identified stations be further reviewed in an IRRP to examine opportunities for integrated solutions involving both wires and non-wires solutions.

## **Demand Forecast – Electrification/Decarbonization**

The 2020 Ottawa sub-region IRRP TWG recommended monitoring the City of Ottawa's Energy Evolution mandate and exploring the potential for alignment between integrated regional planning and the Energy Evolution mandate. Outreach discussions with the City of Ottawa during the development of the 2020 IRRP also identified the potential for future alignment between Energy Evolution and regional planning.

For the upcoming IRRP, the TWG will engage with stakeholders and communities to ensure growth plans and implementation of decarbonization targets are considered and reflected in the IRRP electricity demand forecast. To help support this work, the City of Ottawa, the local distribution companies, and the IESO will participate in focused discussions on the impacts of Energy Evolution and GHG emission reduction targets on the demand forecast. Outcomes of these discussions seek to inform considerations (e.g., timing and magnitude of electrification) that can be used to make refinements to the demand forecast scenario(s) to be contemplated as part of the upcoming Ottawa Area Sub-region IRRP.

## **Recommendation**

Due to the shared geographic impact of the needs identified in the Ottawa Area-sub region, and opportunities which may arise from considering solutions to those needs in a coordinated manner, an IRRP study should be undertaken for the Ottawa Area Sub-region. Due to the number and complexity of needs, the greater number of potential solutions to consider, the potential bulk system impact, the additional EOL opportunities, and the additional engagement needed with stakeholders and communities to ensure growth plans and implementation of decarbonization targets are considered and reflected in the IRRP electricity demand forecast, the full 18-month timeline is expected to be required.

Given that no needs were identified for the Outer Ottawa West and Outer Ottawa East sub-regions, no further coordinated regional planning is necessary for those areas.



## 4. Conclusions and Next Steps

The Scoping Assessment concludes that an IRRP be undertaken to identify, evaluate and recommend solutions to address the needs identified for the Ottawa Area Sub-region. No further coordinated regional planning is required for the Outer Ottawa East and Outer Ottawa West Sub-regions.

All IRRPs will include opportunities for engagement with local communities and stakeholders, as well as include discussion of any local initiatives focused on energy and/or reducing GHG emissions, and how the IRRP can coordinate with these plans. This could include Community Energy Plans, Net-Zero strategies, or similar. Particular attention will be paid to opportunities for information sharing and/or coordination of goals and outcomes.

The draft Terms of Reference for the Ottawa Area Sub-region IRRP is attached in Appendix 2.

## Appendix 1 – List of Acronyms

Acronym	Definition
CDM	Conservation and Demand Management
CTS	Customer Transformer Station
DG	Distributed Generation
DS	Distribution Station
EOL	End of Life
FIT	Feed-in-Tariff
GHG	Green House Gas
GS	Generating Station
IESO	Independent Electricity System Operator
IRRP	Integrated Regional Resource Plan
LDC	Local Distribution Company
LTR	Long-term Emergency Rating
LV	Low Voltage
MTS	Municipal Transformer Station
MVA	Megavolt ampere
MW	Megawatt
NA	Needs Assessment
NERC	North American Electric Reliability Corporation
NPCC	Northeast Power Coordinating Council
OEB	Ontario Energy Board



Acronym	Definition
ORTAC	Ontario Resource Transmission Assessment Criteria
RIP	Regional Infrastructure Plan
SA	Scoping Assessment
TS	Transformer Station
TWG	Technical Working Group

# Appendix 2 – Ottawa Area Sub-region IRRP Terms of Reference

## 1. Introduction and Background

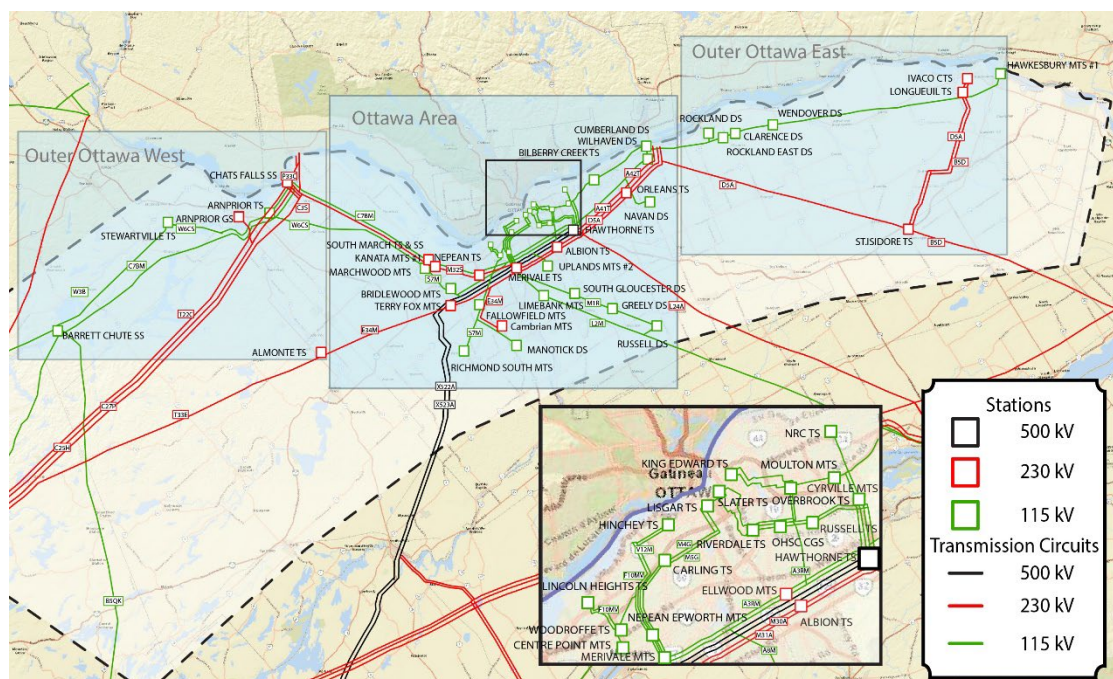
These Terms of Reference establish the objectives, scope, key assumptions, roles and responsibilities, activities, deliverables, and timelines for an Integrated Regional Resource Plan of the Ottawa Area Sub-region region.

Due to the shared geographic impact of the needs identified in the Ottawa Area-sub region, and opportunities which may arise from considering solutions to those needs in a coordinated manner, an IRRP study should be undertaken for the Ottawa Area Sub-region.

### Ottawa Area Sub-region

The Ottawa Area sub-region primarily encompasses the City of Ottawa. Bulk electrical supply to the sub-region is provided through the 500/230kV autotransformers at Hawthorne TS, a network of 230kV and 115kV transmission lines, and two 230/115kV autotransformer stations at Hawthorne TS and Merivale TS. Local generation in the area comprises of the Ottawa Health Science Non-Utility Generator located near downtown and a number of hydro generation stations on the Ottawa River and the St. Lawrence River. Loads in the area are supplied by eight (8) 230kV and thirty-three (33) 115kV transformer stations stepping down to a lower voltage. Two Local Distribution Companies (LDC) – Hydro Ottawa and Hydro One Distribution -provide retail electricity service to load customers in the area. The approximate geographical boundaries of the region are shown in Figure A-3.

**Figure A-3 | Overview of the Greater Ottawa Region**



The Sub-region includes all or part of the following municipalities:

- The City of Ottawa
- Clarence-Rockland
- The town of Arnprior
- Carleton Place
- Mississippi Mills
- The township of East Hawkesbury
- The township of Champlain
- The township of Alfred and Plantagenet
- The township of Russell
- The township of Beckwith
- The township of Drummond/North Elmsley
- The township of Tay Valley
- The township of North Frontenac
- The township of Lanark Highlands
- The township of McNab/Braeside
- The township of Greater Madawaska
- The municipality of The Nation

The Sub-region also includes the following First Nations communities:

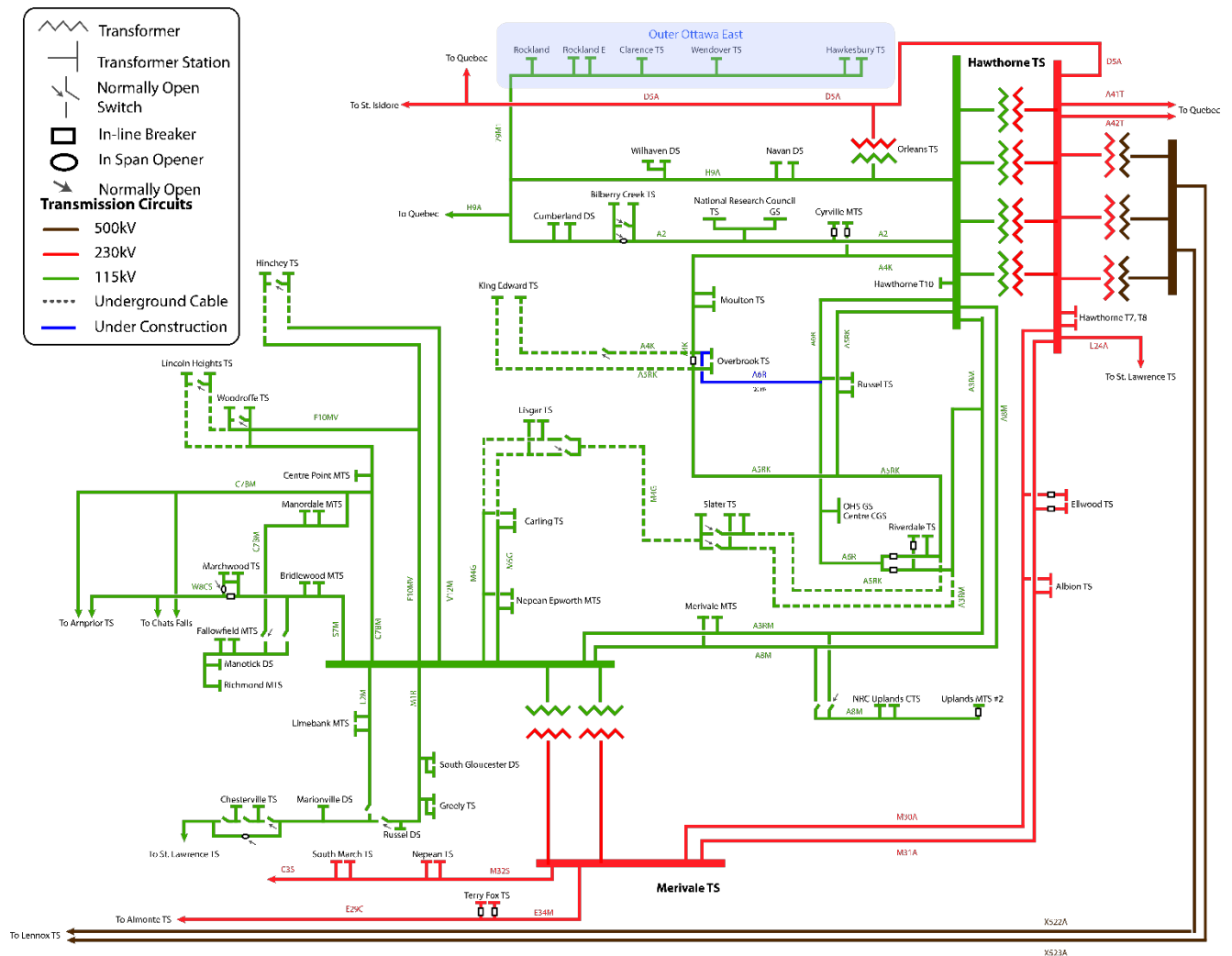
- Algonquins of Ontario (AOO Consultation Office)
- Algonquins of Pikwakanagan
- Huron Wendat
- Mohawk Council of Akwesasne
- MNO Ottawa Region Métis Council

Engagement on this regional plan may be extended to include additional communities outside of the IRRP area boundaries.

### **Ottawa Area Sub-region Electricity System**

The electricity system supplying the Ottawa Area Sub-region is shown in Figure A-4.

**Figure A-4 | Ottawa Area Sub-region Electricity System**



## 2. Objectives

1. To assess the adequacy of electricity supply to customers in the Ottawa Area Sub-region over the next 20 years.
2. To develop a flexible, comprehensive, integrated electricity plan for the Ottawa Area Sub-region.
3. To develop an implementation plan, while maintaining flexibility in order to accommodate changes in key assumptions over time.

### 3. Scope

This IRRP will develop and recommend an integrated plan to meet the needs of the Ottawa Area Sub-region. The plan is a joint initiative involving Hydro One Distribution, Hydro One Transmission, Hydro Ottawa Limited, and the IESO, and will incorporate input from community engagement. The plan will integrate forecast electricity demand growth, conservation and demand management in the area with transmission and distribution system capability, end-of-life of major facilities in the area, relevant community plans, other bulk system developments, and generation uptake, and will develop an integrated plan to address needs.

The following infrastructure is within the scope of this plan:

- **115 kV Stations:** Bilberry Creek TS, Bridlewood MTS, Carling TS, Centerpoint MTS, Cyrville MTS, Fallowfield DS, Greely DS, Hinchey TS, King Edward TS, Limebank MTS, Lincoln Heights TS, Lisgar TS, Manordale MTS, Manotick DS, Marchwood MTS, Marionville DS, Merivale TS, Moulton MTS, National Aeronautical CTS, National Research CTS, Nepean Epworth TS, Orleans TS, Overbrook TS, Richmond DS, Riverdale TS, Russell DS, Russell TS, Slater TS, South Gloucester DS, Uplands MTS, Wilhaven DS, Woodroffe TS
- **230 kV Stations:** Albion TS, Cambrian TS, Ellwood MTS, Hawthorne TS, Kanata MTS, Merivale MTS, Nepean TS, Orleans TS, South March TS, Terry Fox MTS
- **500 kV Stations:** Hawthorne TS
- **115 kV Circuits:** L2M, M1B, S7M, C7BM, F10MV, V12M, M4G, M5G, W8CS, A3RM, A8M, M1G, A5RK, A6R, A4K, 79M1, A2, H9A
- **230 kV Circuits:** E29C, E34M, M32S, C3S, M30A, M31A, L24A, A41T, A42T, D5A
- **500 kV Circuits:** X522A, X523A

The Ottawa Area Sub-region IRRP will:

- Prepare a 20-year electricity demand forecast for the appropriate stations and establish needs over this timeframe
- Examine the load meeting capability and reliability of the existing transmission system supplying the Ottawa Area Sub-region, taking into account facility ratings and performance of transmission elements, transformers, local generation, and other facilities such as reactive power devices
- Establish feasible integrated alternatives including a mix of CDM, generation, transmission and distribution facilities, and other electricity system initiatives in order to address the needs of the Renfrew region
- Evaluate options using decision-making criteria including but not limited to: technical feasibility, economics, reliability performance, environmental and social factors

### 4. Data and Assumptions

The plan will consider the following data and assumptions:

## **Demand Data**

- Historical coincident peak demand information
- Historical weather correction, median and extreme conditions
- Gross peak demand forecast scenarios
- Coincident peak demand data including transmission-connected customers
- Identified potential future load customers
- Customer/load segmentation information (e.g. residential, commercial, industrial) by TS

## **Conservation and Demand Management**

- Conservation forecast for LDC customers, based on region's share of current energy efficiency programs
- Potential for CDM at transmission-connected customers' facilities

## **Local resources**

- Existing local generation, including distributed generation, district energy, customer-based generation, Non-Utility Generators and hydroelectric facilities as applicable
- Existing or committed renewable generation from [previous] 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
- Community Climate Action Plans
- Municipal Growth Plans
- Indigenous Community Energy Plans

## **Criteria, codes and other requirements**

- Ontario Resource and Transmission Assessment Criteria (ORTAC)
- 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 (10-day LTR) as per asset owner
- Load transfer capability
- Technical and operating characteristics of local generation

#### **End-of-life asset considerations/sustainment plans**

- Transmission assets
- Distribution assets
- Other considerations, as applicable

### **5. Technical Working Group**

The core TWG will consist of planning representative/s from the following organizations:

- Independent Electricity System Operator (*Team Lead for IRRP*)
- Hydro One Transmission
- Hydro One Distribution
- Hydro Ottawa Limited

#### **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 their own funding.

### **6. Engagement**

Integrating early and sustained engagement with communities and stakeholders in the planning process was recommended to and adopted by the provincial government to enhance the regional planning and siting processes in 2013. These recommendations were subsequently referenced in the 2013 Long Term Energy Plan. As such, the TWG is committed to conducting plan-level engagement throughout the development of the Ottawa Area Sub-region IRRP.

The first step in engagement will consist of the development of a public engagement plan, which will be made available for comment before it is finalized. The data and assumptions as outlined in Section 4.0 will help to inform the scope of community and stakeholder engagement to be considered for this IRRP.

### **7. Activities, Timeline, and Primary Accountability**



Activity	Lead Responsibility	Deliverable(s)	Timeframe
<b>1. Prepare Terms of Reference considering stakeholder input</b>	IESO	Finalized Terms of Reference	Q2 2023
<b>2. Develop the planning forecast</b>		Long-term planning forecast scenarios	Q2/Q3 2023
Establish historical coincident (for the region) and non-coincident (for Pembroke TS) peak demand information	IESO		
Establish historical weather correction, median and extreme conditions	IESO		
Establish gross peak demand forecast	LDCs		
Establish existing, committed and potential DG	IESO, LDCs		
Establish near- and long-term conservation forecast based on planned energy efficiency activities and codes and standards	IESO		
Develop planning forecast scenarios for sensitivity analyses	IESO		
<b>3. Reconfirm load transfer capabilities for stations in the region</b>	LDCs	Load transfer capabilities under normal and emergency conditions	Q2/Q3 2023
<b>4. Provide and review relevant community plans, if applicable</b>	LDCs, First Nations and IESO	Relevant community plans	Q2/Q3 2023
<b>5. Complete system studies to identify needs</b>	IESO, Hydro One Transmission	Summary of needs based on demand forecast scenarios for the 20-year planning horizon	Q3/Q4 2023
<ul style="list-style-type: none"> <li>- Obtain PSS/E base case</li> <li>- Include bulk system assumptions as identified in Key Assumptions</li> <li>- Apply reliability criteria as defined in ORTAC to demand forecast scenarios</li> <li>- Confirm and refine the need(s) and timing/load levels</li> </ul>			

Activity	Lead Responsibility	Deliverable(s)	Timeframe
<b>6. Develop options and alternatives</b>		Develop flexible planning options for forecast scenarios	Q4 2023/Q2 2024
Conduct a screening to identify which non-wires options warrant further analysis	IESO		
Produce hourly forecasts for each transformer station to enable detailed needs characterization and support options development	IESO		
Develop screened-in energy efficiency options	IESO and LDCs		
Develop screened-in local generation/demand management options	IESO and LDCs		
Confirm the transmission and distribution alternatives: advancement of EOL transformer replacement plans and/or load transfers	IESO, Hydro One Transmission and LDCs		
Develop portfolios of integrated alternatives	All		
Technical comparison and evaluation	All		
<b>7. Plan and undertake community &amp; stakeholder outreach and engagement</b>	IESO	Community and Stakeholder Engagement Plan  Input from local municipalities, First Nation communities, and Métis organizations	Ongoing
Early engagement including with local municipalities and First Nation communities within study area, First Nation communities who may have an interest in the study area, and the Métis organizations	All		
Develop communications materials	All		

Activity	Lead Responsibility	Deliverable(s)	Timeframe
Undertake community and stakeholder engagement	All		
Summarize input and incorporate feedback	All		
<b>8. Develop long-term recommendations and implementation plan based on community and stakeholder input</b>	IESO	Implementation plan  Monitoring activities and identification of decision triggers  Procedures for annual review	Q2 2024
<b>9. Prepare the IRRP report detailing the recommended near, medium and long-term plan for approval by TWG</b>	IESO	IRRP report	Q3 2024

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