



AUGUST 11, 2022

Gatineau Corridor End-of-Life Study Public Webinar #2

Webinar Purpose

- To provide a recap of the proposed recommendations presented during the previous Gatineau Corridor EOL Study public webinar held on April 14, 2022
- To share a summary of stakeholder feedback received and IESO's responses
- To provide additional details regarding the assessment of non-wire alternatives and energy efficiency
- Outline next steps in electricity planning in the area

Agenda

1. Recap of Draft Recommendations
2. Summary of Stakeholder Feedback
3. Energy Efficiency Achievable Potential Assessment
4. Non-wires Alternatives Assessment
5. Economic Evaluation
6. Next Steps

About the IESO



Reliably operate Ontario's power system 24/7



Purposefully engage to enable informed decisions



Plan for Ontario's future energy needs



Support innovation



Enable competition and create efficient electricity markets



Show cybersecurity leadership



Deliver province-wide energy efficiency



Serve as Ontario's Smart Metering Entity



Recap of Draft Recommendations

Recap: Drivers for the Gatineau Corridor EOL Study

An integrated bulk system planning process was recently put in place to formalize the process to enhance transparency and opportunities for stakeholder and community input.

Prior to the formalized process being established, bulk planning was underway in eastern Ontario.

The Gatineau Corridor bulk study was initiated to address the following issues:

- Approximately 800 km 230 kV transmission line reaching end-of-life in 5-10 years
- Existing and forecast reliability needs in the Peterborough to Quinte West and Ottawa areas

Recap: Proposed Recommendations

- The IESO recommends the following integrated solution package:
 - Refurbish all 800 km of 230 kV circuits on the Gatineau corridor
 - Build a new double circuit 230 kV transmission line from either Clarington TS or Cherrywood TS (in Oshawa or Pickering) to Dobbin TS (in Peterborough)
 - Pursue cost-effective energy efficiency in the Ottawa area through province-wide and Local Initiative Programs, while monitoring demand growth and resource acquisition activities in the Ottawa zone



Stakeholder Feedback and Responses

Stakeholder Feedback Themes

- Alternative transmission options should be considered that focus on supplying Ottawa with existing locally generated hydro electricity rather than relying on the existing Gatineau transmission corridor
- The Gatineau Corridor EOL study presents a unique opportunity to build a new transmission line from St. Lawrence to Merivale instead of refurbishing the existing transmission lines, this new transmission line would help in mitigating the impacts of possible extreme events with losing one of the major transmission corridors in Ottawa (Hawthorne to Merivale)

Stakeholder Feedback Themes Cont.

- Durham region is growing, municipalities are actively planning new communities in the surrounding area of the proposed transmission line thus routing must be carefully considered in order to minimize impacts to the development, environment, etc.

Note: For a full list of stakeholder feedback and response please visit the IESO website ([link](#))

Planning Considerations – Hydro Electricity

- Planning criteria is focused on ensuring that the transmission system will operate reliably over a broad spectrum of system conditions and following a wide range of probable system contingencies
- Regarding the availability of hydro-electric generation facilities, planning criteria considers conditions involving low water (drought) where the output from hydro-electric facilities such as those on the Ottawa and Madawaska rivers are producing at low levels
- Re-routing this generation to supply peak Ottawa demand is not a viable alternative to refurbishing Gatineau Corridor transmission lines

Planning Considerations – Greater Resiliency

- Consideration of a “extreme event” such as the loss of an entire transmission corridor and its effect on the reliability of the local Ottawa area is beyond the requirements of applicable planning criteria
- The alternative for a new St. Lawrence to Merivale line offers some improvement to the overall resiliency of the Ottawa system as compared to refurbishing existing Gatineau Corridor transmission lines, however beyond the long-term planning horizon (20 years) or under a high growth scenario, the capacity from both the existing Gatineau corridor transmission lines and the new St. Lawrence to Merivale transmission line is likely to be needed.

Planning Considerations – Line Routing

- New transmission lines in Ontario are subject to the Environmental Assessments (“EA”) Process¹ where line routing will be assessed and evaluated, interested parties will have an opportunity to provide input on line routing to the transmitter as part of the EA
- The draft recommendations indicate that there are different line options (i.e. Pickering to Peterborough vs Oshawa to Peterborough) and that the options are comparable in cost and capability

¹ *Link to the Ontario government website ([here](#))*



Energy Efficiency Potential Analysis

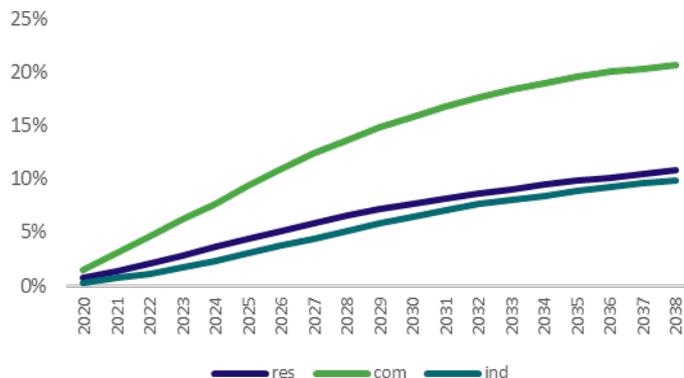
Energy Efficiency Potential Analysis (1)

- In 2019, the IESO and the Ontario Energy Board completed the first [integrated electricity and natural gas achievable potential study in Ontario](#) (2019 APS)
- The main objective of the APS was to identify and quantify energy savings (electricity and natural gas) potential, GHG emission reductions and associated costs from demand side resources for the period from 2019-2038.
- The study shows a significant and sustained potential for energy efficiency across all sectors and is used to inform:
 - future energy efficiency policy and/or frameworks
 - program design and implementation
 - assessments of Conservation and Demand Management (CDM) non-wires potential in regional planning

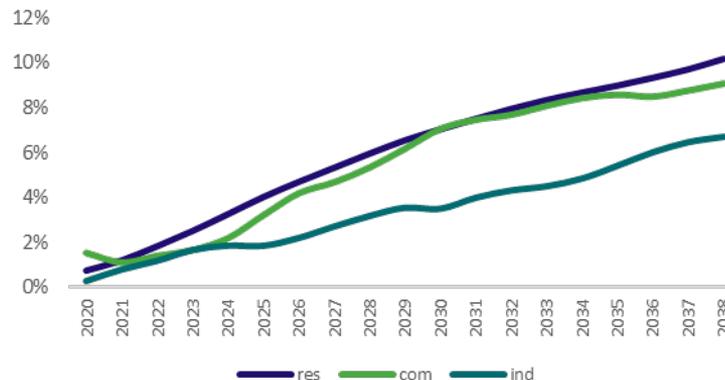
Energy Efficiency Potential Analysis (2)

- Based on APS results, energy efficiency has the potential to reduce demand by ~1% per year on average in the Ottawa zone, with near-term opportunities reduced by CDM commitments and new opportunities increasing in the medium term following conclusion of the 2021-2024 CDM framework

Cumulative Maximum Achievable Zonal Potential as a Share of Consumption

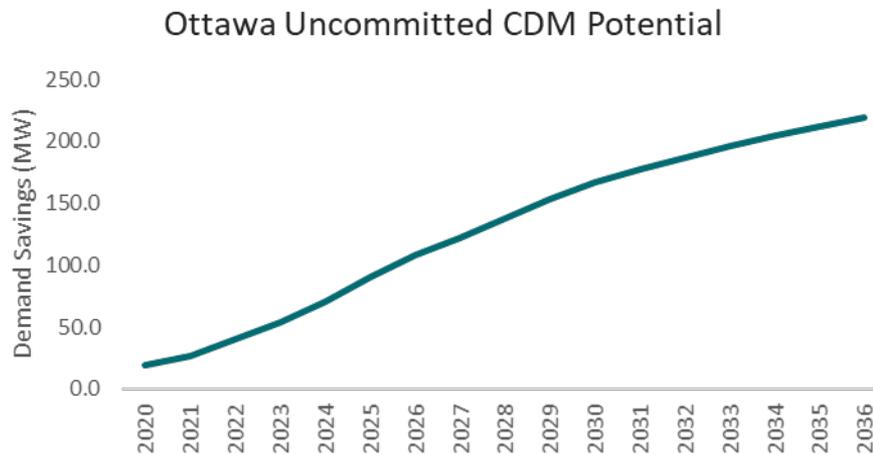


Cumulative Maximum Achievable Zonal Potential as a Share of Consumption Net of Committed Savings



Energy Efficiency Potential Analysis – Ottawa

- Uncommitted cumulative CDM potential that is cost effective based on avoided system energy and capacity costs for stations served by the Gatineau corridor is presented on the right
- The estimated cost to deliver these savings is \$587 million dollars over the forecast period



Ottawa	2027	2037
Max Achievable CDM Potential (MW)	171	301
Committed CDM Potential (MW)	49	73
Uncommitted CDM Potential (MW)	122	228

Energy Efficiency Opportunities

- The IESO can continue to refine these assumptions and explore options to target system cost effective EE in the region
- The [Local Initiative Program](#), under the 2021-2024 CDM Framework, is one tool available to target delivery of additional CDM savings to specific areas of the province with identified system needs
- A review of the opportunity for CDM to be targeted to address regional or local needs and available tools to do so under the current framework is underway as part of the [2021-2024 CDM Framework Mid-Term Review](#)



Non-wires Alternatives Analysis

Identifying options

- Key objective is to identify options for improving capacity, security and reliability of electricity service.
- Identifying viable options takes into consideration the following:
 - Maximizing the use of existing infrastructure and resources in the region (e.g., merchant generation, generators with expiring contracts, etc.) to defer transmission and/or generation investment.
 - New transmission facilities and/or lines to deliver provincial resources.
 - New generation/storage with the attributes that most closely meet the need, or integrated solutions in combination with Demand Response (DR) or Energy Efficiency (EE) measures.

Evaluating options

- In addition to input from community engagement, potential solutions are evaluated based on the following key considerations:

Technical Feasibility

- Can the option actually be executed? i.e., proximity to customers, routing and spacing considerations, operations

Ability to Address Needs

- Are the number, magnitude, and diversity of needs adequately addressed?

Integration & Cost-Effectiveness

- What is the lowest cost solution considering the possibility that one option may be able to address multiple needs simultaneously?
- Would a combination of option types be most effective?

Lead Time

- New transmission infrastructure or resource procurement/development could take 4-10 years – how does this compare to the timing of needs?

Selecting NWAs

- NWAs selection is based on power capacity and energy requirements. The need characteristics are quantified by the energy-not-served (ENS) profile – the forecast hourly demand above the load meeting capability (amount of demand that can be served by existing infrastructure).
- In general, potential options that are known to satisfy technical requirements and have the lowest cost tend to be screened for suitability first.
- Examples of NWAs considered include storage, natural gas-fired resources, as well as integrated solutions in combination such as EE and storage, etc.

Evaluating NWAs: cost comparison

- The NWAs should aim to cost-effectively meet the need on an equivalent reliability basis.
- There are a few tools and methods available to assess cost-effectiveness, but ultimately want an approach that allows for an apples-to-apples comparison of generation and storage options.
- Comparing the same dollars (e.g., Levelized Unit Energy or Capacity Costs), to the same need (size and timing), and providing the same level of reliability/performance.

Discounted cash flow analysis

- Discounted Cash Flow (DCF) analysis finds the net present value (NPV) of expected future cash flows of the resource cost and system benefit by using a discount rate.
 - Future cash flows are “discounted” at a rate that reflects the time-value of money and the inherent risk associated with future uncertainty.
- DCF model is made for each option, which at a minimum includes the following considerations:
 - Cost of the option (i.e., capital costs, OM&A, etc.) amortized across the life.
 - Bulk system capacity benefits and bulk system energy benefits which account for any instance where the option displaces higher marginal cost resources.

Economic Evaluation

Option	Capital Cost NPV (\$2021 M)	Capacity/Energy System Benefit NPV (\$2021 M)	Net Cost NPV (\$2021 M)
Peterborough to Quinte West Transmission Reinforcement	298	N/A	298
T22C/T33E Transmission Refurbishment	312	N/A	312
Total			610
NWA: Peterborough to Quinte West Storage* (100MW, 800 MWh)	540	214	326
NWA: Ottawa Storage* (480MW, 6240 MWh)	2,001	662	1,349
Total			1,675

*Storage is modular and deployed in discrete blocks as demand grows.

Note: Storage costs are derived from the [2021 National Renewable Energy Laboratory Annual Technology Baseline \(ATB\) Cost and Performance Data for Electricity Generation Technologies data set](#). Further detail to be provided in the Gatineau End-of-Life study final report.



Interdependencies with Other Regional Plans

Interdependencies Between Bulk and Regional Needs

Ottawa 115 kV System Supply and Orleans Area Planning Study

- Emerging load growth beyond the reference forecast has been identified for parts of Ottawa currently served by the 115 kV system; the growth, if materialized, will place added pressure on the reliability of the Ottawa 115 kV System
- The Greater Ottawa regional planning working group has identified the need to trigger the start of regional planning for the Greater Ottawa region early to assess the emerging load growth (~Q3 2022)
- Further evaluation of this load growth through regional planning could advance the need for further bulk transmission upgrades
- The working group is re-evaluating a past recommendation to refurbish the end-of-life Bilberry Creek TS in light of the emerging load growth, and the opportunity to build a new 230 kV supplied station in the area to offload the load currently served by Bilberry Creek TS on the 115 kV system

Interdependencies Between Bulk and Regional Needs Cont.

GTA East Regional Planning

- Emerging load growth beyond the most recent regional planning forecasts have been identified in the Whitby area
- Consideration to trigger the next cycle of regional planning for GTA East early is being made to assess the emerging load growth
- Regional planning for the GTA East may influence the preference between the a Pickering to Peterborough line vs a Oshawa to Peterborough line, as a Pickering to Peterborough line may also serve to benefit the connection of additional loads in the Whitby area



Engagement and Next Steps

Recommendations

- The IESO recommends the following integrated solution package:
 - Refurbish all 800 km of 230 kV circuits on the Gatineau corridor
 - Build a new double circuit 230 kV transmission line from either Clarington TS or Cherrywood TS (in Oshawa or Pickering) to Dobbin TS (in Peterborough)
 - Pursue cost-effective energy efficiency in the Ottawa area through province-wide and Local Initiative Programs, while monitoring demand growth and resource acquisition activities in the Ottawa zone

Next Steps

- Written feedback on the draft recommendations due on September 1
- Final Gatineau EOL Plan is expected to be posted at the end of September
- Continued outreach will take place to inform discussions surrounding the interdependencies between bulk and local needs in eastern Ontario
- Technical Working Group discussions will continue in Q3 to determine if the next cycles of regional planning will be triggered in 2022.

Seeking Input

As you prepare your feedback, consider the following questions to guide your feedback on the options analysis presented for the Peterborough to Kingston IRRP:

- What information should be considered in finalizing the recommendations?
- How can the IESO continue to engage with the community as these recommendations are implemented, or to help prepare for future bulk and regional planning work?

Please submit your written comments by September 1, 2022

using the feedback form by email to engagement@ieso.ca

Stay Connected

- **Visit** the **dedicated engagement webpage**
- **Join** the **East Regional Electricity Network** to participate in a broader regional dialogue

Thank You

ieso.ca

1.888.448.7777

customer.relations@ieso.ca

engagement@ieso.ca



[@IESO Tweets](https://twitter.com/IESO)

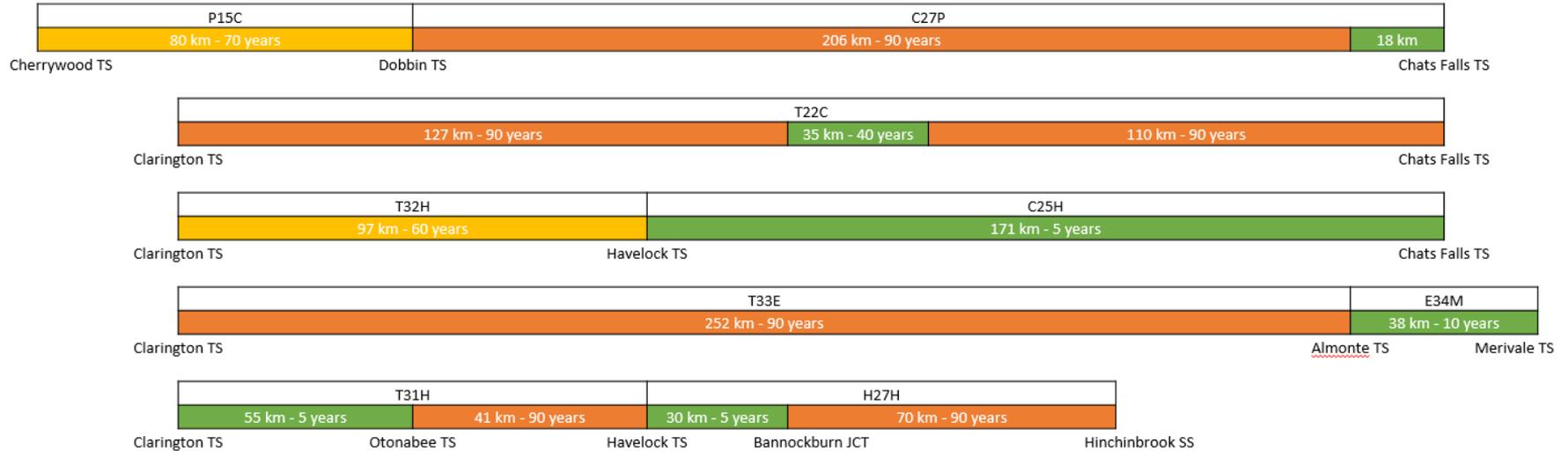


[linkedin.com/company/IESO](https://www.linkedin.com/company/IESO)



Appendix

Gatineau Corridor Asset Demographics



- GREEN** Recently refurbished, the plan assumes continued service
- YELLOW** Intermediate age
- ORANGE** Sections that are ~90 years old total 806 km