Feedback Form

Regional Electricity Planning in Ottawa Area Subregion – December 12, 2024

Feedback Provided by:

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Date: December 23, 2024

Following the Ottawa Area Subregion electricity planning engagement webinar held on December 12, 2024, the Independent Electricity System Operator (IESO) is seeking feedback on the potential wire options and Local Achievable Potential Study as outlined during the presentation. A copy of the presentation as well as the recorded webinar can be accessed from the engagement webpage.

Local considerations and feedback are a critical component to the development of an Integrated Regional Resource Plan (IRRP). As the options phase of the IRRP continues to identify how to best meet the area's electricity needs, the IESO wants to hear from you.

Please submit your feedback to engagement@ieso.ca by **January 2, 2025.**

Regional Planning

Topic	Feedback
What perspectives do you have on the potential wire options?	Please see General Comments/Feedback below.
What information should be considered in the evaluation of non-wire options?	Please see General Comments/Feedback below.
Are there any additional information that should be provided in future engagements to help understand municipal perspectives and insights?	n/a

Local Achievable Potential Study

Topic	Feedback
Is there any feedback on the scope, methodology and potential uses of the Local Achievable Potential Study that the IESO should consider?	Please see General Comments/Feedback below.
Are there additional data sources or regional policies/trends that should be considered in the Local Achievable Potential Study?	n/a

General Comments/Feedback

Dear Sir/Madam,

Thank you for the opportunity to submit comments on Webinar #2 of the Regional Electric Planning process for Ottawa.

I, my family, my neighbors, and community are directly impacted by the decisions of the IESO. The decisions made by IESO in this electric system planning process will have important repercussions in the Ottawa region, impacting the daily lives of Ottawa residents from the local economy to weather-related outages. It is crucial that planning for the future of the electric system is thoughtful and includes considerations from the public who will be directly impacted by the decisions of the IESO.

Below is a summary of my comments and request for clarification, with detailed comments in the sections which follow.

Summary of my Comments

- Regarding potential wire options:
    - System planners should consider the synergies between Wires options and Non-Wires options when implemented together instead of considering them as alternatives to one another.
    - Resilience should be a priority when designing and siting new wire options.
    - The benefits of storm hardening measures should be studied and where reasonable, storm hardening measures should be implemented.
    - New approaches should be considered including submarine transmission for Core East and self-healing/microgrid technology.
- Regarding non-wire options:
    - A wholistic approach to valuing the benefits of non-wire options should be taken, including both system benefits and community benefits to ensure that important benefits like resilience, local economic benefits, and avoided health impacts are not missed.
    - The need for resilience gives rise to a dual emphasis on meeting system needs and enabling community owned and financed sustainable energy solutions within the city.
- Regarding the Local Achievable Potential Study:
    - The Local Achievable Potential Study should include a wholistic approach to valuing system and community benefits as suggested for non-wire options.
    - The IESO should reconsider its choice not to study V2G at this time as this technology is already being implemented in other places.

Request for Clarification

On slide 28 of Public Webinar #2, IESO states that “Storage/generation is not an option for these needs as it risks adding extra load.” This raises the following questions:

- Why is the IESO considering energy storage/generation a load?
- What is meant by “Storage/generation”? Is it meant behind the meter storage/generation, storage/generation connected to the distribution system, or transmission-level storage/generation?

- Is the determination that "storage/generation is not an option for these needs as it risks adding extra load" based on an industry standard (e.g. IEEE)?

Detailed Comments

1. **When focusing on potential wire options:**

   System planners should consider the synergies between Wires options and Non-Wires options when implemented together instead of considering them as alternatives to one another.

When planning for the expected needs from population growth and electrification, planners should recognize the potential synergies between wire and non-wire approaches when both are considered and implemented together.

The phrase "non-wire alternatives" suggests that wire approaches and non-wire approaches are an either/or. However, to meet the needs of Ottawa's residents, wholistic and integrated thinking is called for. Important system planning considerations should include:

- How can wires be implemented in a manner that facilitates the interconnection of local distributed energy resources?
- Where would distributed energy resources be most leveraged to improve reliability and resilience of the wire system?
- Where can distributed energy resources be most helpful for deferring or eliminating the need for costly upgrades?

Wire options are effective at moving electrons across physical distance. Non-wire options excel at providing energy services where they are needed, and with storage, when they are needed. Both wire and non-wire options face constraints such as space and cost, however when implemented together synergies emerge. These synergies can include a reduced need for new long-distance transmission infrastructure to be built, avoided line losses, the provision of important grid services such as power quality and other ancillary services, as well as resilience.

By taking an integrated, forward-looking approach, planners can successfully meet Ottawa's energy needs and enable a grid which is more resilient to the increasingly frequent and severe extreme weather Ottawa is experiencing. Ottawa's energy system has limited resilience due to its dependence on a small number of long-distance transmission lines and substations. This leaves residents of Ottawa vulnerable to massive power outages in the event of more frequent and intense storms like we have been experiencing in the area.

Enhanced resilience can emerge when wires and non-wires work together. When the electric system goes down due to extreme weather or other system failure, it can be valuable to have energy sources near points of energy consumption. Non-wire approaches that can operate independently when needed can be crucial when the larger network fails. Working together, non-wire and wire options can create a system that is better than either alone.

A brighter future for Ottawans can be achieved if system planners anticipate how the existing system might best work with local distributed energy resources. Integrating substantial local renewable energy and storage development into wire infrastructure planning can help avoid interconnection backlogs as have occurred in the United States. Consideration should therefore be given to how wire options can meet system needs while enabling a local sustainable energy future through integration of distributed energy resources.

Important actions to consider in evaluating wires options: Resilience, Storm Hardening Analysis, and New Approaches to meeting Ottawa's energy needs

- Resilience to current and future extreme weather risks should be a key part of the design for potential wire options being evaluated.
    - Building new infrastructure with resilience included in the design will help prevent outages and avoid the need to rebuild infrastructure later at a significantly higher total cost.
    - Diversification of siting of critical infrastructure such as substations should be considered given the likelihood of future tornados and derechos in Ottawa.
- Storm hardening measures such as undergrounding key infrastructure may be expensive, but IESO should do a complete analysis of the costs to utilities, governments, businesses, institutions, and individuals associated with repeated grid failures and repairs. Preparing the system for extreme weather such as ice storms, tornados, and severe winds should occur in the near term.
- New approaches to consider…
    - Underwater (submarine) transmission below the Ottawa river could be considered as an option for bringing additional electricity to Core East (downtown) from Hydro Quebec and/or renewable generation sited outside downtown. Additional interconnections with Hydro Quebec would help meet system needs, strengthen the system, and help Core East decarbonize.
    - Modernizing the grid with sensors that reduce the number of customers affected by an outage through self-healing/micro-grid technology could help achieve greater resilience.[1] Self-healing/microgrid technology, when coupled with distributed energy resources, could be a big boost for community-wide resilience.

The potential wire options should be future-focused, with a dual emphasis on meeting system needs and enabling community owned and financed distributed energy solutions within the city. A more resilient future in which a substantial share of the city's energy needs is met by clean local resources can be achieved if we plan for it.

Approaches that improve resilience including storm hardening, diversification of siting, additional interconnections with Hydro Quebec, and self-healing/microgrid technology should be evaluated and pursued.

[1] *Self-Healing Technology Helps Duke Energy to Expedite Restoration During Back-to-Back Hurricanes*, T&D WORLD (Nov. 14, 2024), https://www.tdworld.com/electric-utility-operations/article/55243037/self-healing-technology-helps-duke-energy-to-expedite-restoration-during-back-to-back-hurricanes;

Mollie Rappe, *Creating the Self-healing Grid of the Future: Sandia Leads Development of Algorithms for Resilient Microgrids* (Jan. 25, 2024), https://www.sandia.gov/labnews/2024/01/25/creating-the-self-healing-grid-of-the-future/.

2. Important considerations in evaluating non-wire options

A wholistic valuation approach should be taken by system planners.

The IESO should take a wholistic approach to valuing the benefits of non-wire options. This means recognizing that non-wire approaches offer a host of benefits to both the wires system and to the community.

The system benefits that non-wires options offer include that they can reduce the need for new long-distance transmission infrastructure to be built, avoid line losses and provide important grid services such as power quality and other ancillary services.

Benefits to the community are also important to include in any evaluation because it is fundamentally the community and the people who comprise it which the electric system is serving. Community benefits can include local economic benefits, public health benefits (including carbon reduction/avoidance), and resilience.

These community benefits should be valued by IESO and presented to the public in its analysis:

- Local Economic Benefits: Because Ottawa's electricity generation is distant, the city does not reap the economic benefits that accompany local community owned and financed energy solutions. Renewable energy solutions located in Ottawa can add to the property tax base, improve energy resilience, and avoid the costs of long-distance transmission.
- Public Health Benefits: Public health benefits come into the picture when considering electrification of vehicles. School buses are a powerful example. The diesel exhaust of school buses is a carcinogen and a cause of asthma, among other harms to children's health.[2]

  IESO should consider electrification of Ottawa's school buses as a means to obtain significant amounts of storage that can benefit the grid, and it should value the health benefits that accompany reduced air pollution. Because of the benefits that electric vehicles can offer to the grid and the community, IESO planning should support and anticipate rapid electrification of corporate and institutional fleets as well as general vehicle electrification.

- Resilience: A good example of a benefit that deserves to be studied and appropriately valued is the resilience boost that locally produced renewable energy + storage can offer to the community.

  In recent years, Ottawa's residents and institutions have been impacted by an increase in power outages due to extreme weather events including tornadoes, derechos, and ice storms. These outages have highlighted the vulnerability of all aspects of our electric system to extreme weather. Transmission towers have crumpled, a key substation has been knocked out, and distribution lines have been blown down, taking out power to hundreds of thousands of Ottawans repeatedly.

[2] Emma Jarratt, *Dirty Driving: Combustion School Buses are Harming Children's Health. Why isn't Canada Racing to Transition to Electric?*, ELECTRIC AUTONOMY (Sept. 5, 2024), https://electricautonomy.ca/fleets/2024-09-05/school-bus-electric-canada-transition/.

May 2022, derecho wind storm damages power lines and transmission tower

The impacts of power loss can affect everyone in the community and come with substantial costs. Impacts can range from disruption to a person's daily life, to damage to their home (e.g. flooding or frozen pipes), to serious health and safety risks. The vulnerable including the elderly, people with disabilities, and those with lower incomes are most at risk as they have the least ability to cope with the impacts or adapt to frequent and/or long-lasting outages by purchasing a generator, an electric vehicle with backup power capability, or batteries.

Both behind and in front of the meter solutions are needed and the resilience benefits that they provide should be valued considering the foreseeable impacts of the worsening climate risks that Ottawa faces.[3]

<u>The need for resilience gives rise to a dual emphasis on meeting system needs and enabling community owned and financed sustainable energy solutions within the city.</u>

Community-scale renewable generation + storage connected to the distribution system in front of the meter, especially when coupled with self-healing/microgrid technology can make the electricity system as a whole more resilient.

Communities deserve an opportunity to help address the limitations of the electric system through individual and community energy solutions. With thoughtful distributed energy planning, citizens can contribute capital, space, or renewable energy generation to help meet their own needs as well as the needs of others in their community. This gives Ottawans greater choice and agency in problem solving. Among other benefits, this democratization of energy production will take capacity stress and resiliency strains off the wire system.

The IESO should take a wholistic look at the benefits of non-wires options to both the electric grid and the community, including in economic analysis the value of:

- Avoided Generation, Capacity and Transmission costs (including peak demand shaving and reduced line losses)
- Power quality and ancillary services
- Local economic benefits and tax revenue
- Public health benefits
- Carbon emissions reduction/avoidance

[3] *See, e.g.,* Rebecca S., *The Haunting Reality of Climate Change and its Impact on Energy*, HYDRO OTTAWA (Oct. 24, 2024), https://hydroottawa.com/en/blog/haunting-reality-climate-change-and-its-impact-energy.

- Resilience

The Ottawa community deserves an opportunity to help address the electric system's limitations through community-based approaches given the increasingly frequent and severe weather it faces.

3. Specific feedback on the scope and methodology of the Local Achievable Potential Study that the IESO should consider

The Local Achievable Potential Study should include a wholistic approach to valuing system and community benefits as suggested for non-wire options.

The scope of the Local Achievable Potential Study should include analysis of the benefits discussed in the preceding item on non-wire options (see bulleted list at end).

The IESO should reconsider its choice not to study V2G at this time as this technology is already being implemented in other places.

IESO should include V2G (vehicle to grid) in the Local Achievable Potential Study.

In Webinar 2 IESO indicated that it is not currently planning to consider V2G as a measure in the Local Achievable Potential Study "due to significant uncertainty around many of the input assumptions."

It would be helpful if IESO could provide information about what the uncertainties are that are preventing it from studying this solution. No doubt the technology will continue to improve, but perhaps baseline assumptions based on the vehicles that are available today can be drawn. There are a number of school districts in North America which have already deployed V2G for the benefit of the grid. For example, in Oakland, California there are 74 school buses with V2G already deployed.[4]

In addition, there are two commercially available passenger vehicles that offer V2G capabilities, the Ford F-150 Lightning and Nissan Leaf, with automakers promising more. The Ford F-150 Lightning has the equivalent of 10 Tesla Powerwalls of battery capacity and the ability to export power to a building or to the electric system during times of need. In the U.S., virtual power plants are already up and running using Ford F-150 Lightnings.[5]

IESO should be asking the question: what if all school buses in Ottawa were electric and equipped with V2G? What would be the value to the electric system that these buses could provide and what would be their value to the community?

Please reconsider the choice not to study the role that electric vehicles can play in supporting the grid in a bi-directional capacity in Ottawa. This technology is available in the marketplace and is being deployed. Now is

[4] Jeff St. John, *The Country's Biggest Electric School-bus Fleet will also Feed the Grid*, CANARY MEDIA (Sept. 3, 2024), https://www.canarymedia.com/articles/clean-fleets/the-biggest-electric-school-bus-as-grid-battery-project-in-the-us-goes-live.

[5] Press Release, SunRun Investor Relations, *Sunrun Launches Nation's First Vehicle-To-Home Grid Support in Maryland using Ford F-150 Lightning Trucks* (July 24, 2024), https://investors.sunrun.com/news-events/press-releases/detail/318/sunrun-launches-nations-first-vehicle-to-home-grid.

the time to put in place the regulatory structures and financial incentives to enable electric vehicles and other forms of distributed storage to actively contribute to the wellbeing of the electric system.

Summary:

- Regarding potential wire options:
  - System planners should consider the synergies between Wires options and Non-Wires options when implemented together instead of considering them as alternatives to one another.
  - Resilience should be a priority when designing and siting new wire options.
  - The benefits of storm hardening measures should be studied and where reasonable, storm hardening measures should be implemented.
  - New approaches should be considered including submarine transmission for Core East and self-healing/microgrid technology.
- Regarding non-wire options:
  - A wholistic approach to valuing the benefits of non-wire options should be taken, including both system benefits and community benefits to ensure that important benefits like resilience, local economic benefits, and avoided health impacts are not missed.
  - The need for resilience gives rise to a dual emphasis on meeting system needs and enabling community owned and financed sustainable energy solutions within the city.
- Regarding the Local Achievable Potential Study:
  - The Local Achievable Potential Study should include a wholistic approach to valuing system and community benefits as suggested for non-wire options.
  - The IESO should reconsider its choice not to study V2G at this time as this technology is already being implemented in other places.
- Lastly, clarification is requested on Slide 28 from Public Webinar #2 as mentioned above.

I very much appreciate your careful consideration of the thoughts and suggestions enclosed here. Please let me know if clarification or additional detail is needed or if I might be of assistance in any way.

Thank you,

Aaron Kelly, Esq.

Master of Energy Regulation and Law, Juris Doctor