

Feedback Received and IESO Response

Toronto Regional Electricity Plan Public Webinar #2: Draft Electricity Needs – December 5, 2024

The IESO hosted a public webinar on December 5, 2024, for the [Toronto Region](#) as part of its engagement to inform the development of a long-term regional electricity plan – Integrated Regional Resource Plan (IRRP). During the webinar, the IESO provided a re-cap of the regional electricity planning process, an overview of the draft regional electricity needs in the area, background on determining options to help inform the next IRRP milestone, an overview of the scope and methodology for the Local Achievable Potential Study (L-APS), next steps for milestones and engagements, and concluded with a thoughtful discussion with participants. The presentation material and recorded webinar are available on the [engagement webpage](#).

The IESO appreciates the input received, which will be considered by the Technical Working Group¹ to develop the IRRP. Feedback was received from the following parties and the full submissions can be viewed on the [engagement webpage](#):

- [2078977 Ontario Ltd.](#)
- [BGO](#)
- [Cerebral Energy Advisors](#)
- [Citizens Climate Lobby](#)
- [City of Toronto](#)
- [David Smith](#)
- [Enbridge Gas](#)
- [Environmental Defence Canada](#)
- [Environmental Defence Canada – Media Backgrounder](#)
- [Gail Faveri](#)
- [John Stephenson](#)
- [Mark Freeman](#)
- [Melanie Duckett-Wilson](#)
- [Mimico Residents Association](#)
- [NRStor Inc.](#)
- [Ontario Clean Air Alliance](#)
- [Ontario Clean Air Alliance \(prior submission\)](#)
- [The Atmospheric Fund](#)
- [The Boltzmann Institute](#)
- [Toronto East Residents for Renewable Energy](#)

¹ The Technical Working Group consists of the IESO as the lead, the local transmitter (Hydro One Networks Inc.), and the Local Distribution Company (Toronto Hydro – Electric System Limited).

The section below summarizes feedback received related to the draft electricity needs, potential options for consideration to meet electricity needs, as well as feedback on the scope, methodology, and uses of the L-APS study to be considered in electricity planning for the Toronto Region.

Note on Feedback Summary and IESO Response

The IESO appreciates the feedback received from stakeholders and communities. The tables set out below respond to the feedback received and are organized by theme.

Toronto Integrated Regional Resource Plan (IRRP)

1. Considerations for Electricity Demand Forecast Scenarios

Feedback submissions indicated that more information on the assumptions for the demand forecasts would improve transparency and help to inform third-party studies and broader energy planning. Feedback submissions also indicated a range of opinions that the demand forecasts were either over or underestimated. Feedback on these topics is summarized below.

Feedback / Common Themes	IESO Response
Improve transparency of the demand forecast by providing more information, specifically: - Boltzmann Institute suggested that modeling information and assumptions for all scenarios be made publicly available. - BOMA requested confirmation if the Toronto Hydro demand forecast in the Toronto IRRP is the same demand forecast Toronto Hydro submitted in the 2025-2029 Distribution Rates application ('Rates application'), what the differences are (if any), and did Toronto Hydro consider the decarbonization evidence BOMA submitted as part of the Rates application in the Toronto IRRP forecast. - Cerebral Energy Advisors stated there is a lack of transparency on the assumptions underpinning the demand forecast and expressed concerns that newer information is not appropriately captured in the forecast. - Cerebral Energy Advisors proposed that it would be helpful to include high-level cost estimates for the reference and high electrification scenarios as a litmus test of the	The IESO strives to make information available throughout the development of the Integrated Regional Resource Plan (IRRP) to enable meaningful feedback during the process and decisions to be made. Data and information to be made available during IRRP development is outlined in the IESO Regional Planning Information and Data Release Guideline. Typically, the IESO provides a high-level load forecast summary in its first engagement webinar and will share detailed methodologies in the final report. For the Toronto IRRP, the IESO shared detailed forecasts and methodologies early in the process to encourage more meaningful community and stakeholder input. The details for the Forecast Methodology and Data Tables underpinning the demand forecast have been publicly posted to the IESO's Toronto website. As part of the regional planning process, the IESO uses the forecast scenarios to identify needs within the system and investigates solutions to meet

Feedback / Common Themes	IESO Response
affordability of proposed government targets for EV adoption, heating electrification, net zero, and emission plans. - Enbridge Gas suggested more information should be provided on how the forecasted demand versus actual demand is measured and compared, citing that this information would be helpful to inform its own demand forecast. - Enbridge Gas requested the total number of dwellings/buildings forecasts (or estimate), such that a gross number of residential dwellings and commercial and industrial buildings forecasted for heating electrification be calculated from the Toronto IRRP Forecasting Methodology, Table 4 Electrified Heating Adoption Rates. - John Stephensen requested additional information related to the demand forecast heating assumptions in the IRRP and the Pathways to Decarbonization Study to help inform a report by the Boltzmann Institute.	identified needs. During upcoming milestones, cost estimates will be developed for potential options. The IESO generally relies on the latest information and data available at the time of the IRRP development. The Technical Working Group (TWG) will continue to monitor developments and track progress towards IRRP plan deliverables. The timing of recommendations is based on the electricity needs, informed by the load forecast and customer commitments, as well as implementation timelines of the optimal solution. This approach balances cost to customers with the risk of over or under building infrastructure. Accounting for change in uncertain time, if underlying assumptions change significantly, local plans may be revisited through an amendment or by initiating a new regional planning cycle sooner than the five-year schedule mandated by the Ontario Energy Board. For the High Electrification Scenario assumptions in Table 4 in Section 3.2 of the Toronto IRRP Forecasting Methodology, 25% of Commercial and Industrial, and 64% of Residential gross floor area is forecasted to use electrified heating by 2030, and 100% of all buildings are forecasted to use electrified heating by 2040. The IRRP forecast is distinct from Toronto Hydro's 2025-2029 Rate Application system peak demand forecast. The IRRP forecast is produced by the Technical Working Group using inputs from various sources including Toronto Hydro and impacts of provincial codes, standards, and energy efficiency programs, whereas the Rate Application forecast was solely produced by Toronto Hydro. In addition, Toronto Hydro's 2025-2029 Rate Application system peak demand forecast was a 10-year forecast with a particular focus on the 5 years of the rate period at issue (i.e., 2025-

Feedback / Common Themes	IESO Response
	2029), whereas the IRRP demand forecast has a 20-year outlook. Given the different timeframes of those forecasts, electrification of building heating was not a significant factor in the short-term and therefore was excluded from Toronto Hydro's system peak demand forecast Rate Application, while it is forecasted to become a significant variable and is therefore included in the IRRP. More details about the assumptions used in the Pathways to Decarbonization report can be found on the IESO's website. Please note that Provincial forecasts that are typically done at a broader zonal scale are not as useful for regional planning.
Perspectives on the forecast for future electricity demand are divided, with some participants indicating that the forecast is overestimated and others sharing that the forecast is underestimated, specifically: • Boltzmann Institute argued that the estimate of peak demand in the high electrification forecast, that assumes 100% electrification of space heating, is too low. The Boltzmann Institute provided alternative space heating assumptions to support their argument and for the IESO's consideration. • Gail Faveri shared that projections of energy demand are often overestimated due to the uncertainty of the future. • John Stephenson suggested that if the demand forecast was consistent with TransformTO then the demand forecast would be much higher.	Thank you for sharing considerations about the demand forecast, scenarios and assumptions. To develop the draft demand forecast, forecast data is provided by the local distribution companies in the Toronto electrical area to the IESO. The IESO accounts for the assumed impacts of existing and expected impacts of energy efficiency, distributed energy resources, and extreme weather conditions to develop the draft electricity demand forecasts. The Technical Working Group has developed two forecast scenarios to assess the region's needs. These two scenarios allow for rigorous technical studies to be conducted to determine needs that would arise on the system in each case, develop a range of options, and prepare recommendations as part of the final plan to ensure a reliable and adequate supply of electricity to the region. By planning against two scenarios, this allows for further action in the future if, and when, higher growth materializes. This will enable demand growth in a timely manner while minimizing ratepayer risks associated with overbuilding or building too early.

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	Under the High Electrification Scenario, 25% of Commercial and Industrial, and 64% of Residential gross floor area is forecasted to use electrified heating by 2030, and 100% of all buildings are forecasted to use electrified heating by 2040. This aligns with targets for electrified heating in the TransformTO Net Zero Strategy. For more information, please see Table 4 in Section 3.2 of the Toronto IRRP Forecasting Methodology. The regional planning process is cyclical and there will be opportunities to track and monitor key drivers over time, allowing plans to be adjusted if electrification occurs at a faster pace or results in additional investment in electricity infrastructure. The IESO has shared the alternative space heating assumptions with Toronto Hydro for their consideration.
Mimico Residents Association suggested that the IESO actively pursue the high forecast scenario.	Thank you for this feedback and recommendation. The IESO uses a reference and high forecast scenario to identify needs within the system and investigate solutions to meet identified needs. By planning with two scenarios in mind, this allows for further actions in the future if, and when, higher growth materializes. This will enable demand growth in a timely manner while minimizing ratepayer risks associated with overbuilding or building too early.
Melanie Duckett-Smith wanted to confirm whether uptake rates for energy storage projects, solar and geothermal microgrids, and consumer conservation that resulted in stagnant electricity demand (despite population growth) have been accounted for.	To develop the demand forecast, forecast data was provided by Toronto Hydro. The IESO then accounted for the energy savings impacts of past, existing and expected energy efficiency delivered through the IESO's Save on Energy programs, forecasted distributed energy resources uptake, and extreme weather conditions to develop the electricity demand forecasts.

Feedback / Common Themes	IESO Response
	The demand forecast is aligned with local drivers such as municipal and community energy plans (e.g., Official Plans, Secondary Plans, TransformTO, etc.), as well as changes in consumer demand resulting from typical efficiency improvements and response to increasing electricity prices.

2. Scope and Planning Approach

Feedback submissions indicated desire for greater transparency throughout the IRRP process to enhance public confidence, facilitate broader energy planning, and inform third-party analysis. Feedback submissions also advocated for enhanced coordination between infrastructure and energy planning, and an interest in expanding Technical Working Group membership. There was broad support for the inclusion of a scenario without Portlands Energy Centre (PEC) in the IRRP, and for decarbonization to be considered in the planning approach. Feedback submissions also provided considerations for future engagements. Feedback on these topics is summarized below.

Feedback / Common Themes	IESO Response
Support for greater transparency in the IRRP process, specifically: - City of Toronto proposed that where possible, the IESO should make public datasets used in the IRRP process to enhance the confidence of the IRRP process and support further analysis by third parties on how to meet Toronto's electricity needs. - Enbridge Gas wanted more information about how the system reliability and resiliency would be assured, especially, as PEC scenario is being considered.	The IESO is committed to an open and transparent planning process. The IESO strives to make information available throughout the development of the Integrated Regional Resource Plan (IRRP) to enable meaningful feedback during the process and decisions to be made. Typically, the IESO provides a high-level load forecast summary in its first engagement webinar and will share detailed methodologies in the final report. However, for the Toronto IRRP, the IESO shared detailed forecasts and methodologies and data tables early to encourage more meaningful community and stakeholder input. Data and information to be made available during IRRP development is outlined in the IESO Regional Planning Information and Data Release Guideline. Datasets and other planning

Feedback / Common Themes	IESO Response
	documents will be housed on the IESO's Toronto website. The regional system planning process ensures a reliable supply of electricity to Ontario's 21 electricity planning regions. This process looks at the unique needs of each region, and considers energy efficiency, generation, transmission and distribution, and innovative resources to meet these needs. Through this process, recommendations on how best to meet reliability needs after considering all these factors are developed. Regional planning is a continual process with plans developed for a 20-year outlook but evaluated every five years at minimum. We plan to meet reliability standards and consistent resilience in evaluation of alternatives. The Toronto IRRP is considering the city's needs with respect to reliability standards with reduced reliance on Portlands Energy Centre and will explore options to meet these needs.
Interest in enhanced coordination across infrastructure and energy planning, specifically: • Enbridge Gas Inc. recommended a coordinated and diversified approach to energy system planning that includes both gas and electricity planning to understand how the gas system can support and/or minimize peak demand on the electric system. • NRStor Inc. recommended that the IESO, transmission operator, and LDCs work closely with municipalities to ensure alignment with infrastructure planning.	Thank you for your feedback and recommendations for enhanced coordination. The Technical Working Group acknowledges the potential benefits of coordination between electricity and infrastructure planning processes and welcomes further discussion and input on the options available to meet needs. The IESO will continue to engage and collect input throughout the planning process. The Ministry of Energy and Mines recently released the province's Integrated Energy Plan (<i>'Energy for Generations'</i>) that reflects a coordinated and long-term approach to ensure Ontario has access to reliable and affordable energy. The IESO looks forward to working with the Ministry of Energy and Mines, Ontario Energy Board, local distribution companies, municipalities, and gas utilities as part of this new approach. Furthermore, the IESO engages

Feedback / Common Themes	IESO Response
	directly with municipalities at each milestone of the IRRP to ensure alignment between municipal initiatives (i.e., climate action plans, economic development plans, etc.) and energy planning, and that community priorities are incorporated into final recommendations.
Interest in expanding representation of the Technical Working Group, specifically: • Enbridge Gas expressed interest in providing technical input and insights to the Technical Working Group. • NRStor Inc. proposed that the Technical Working Group be expanded to include community representatives and developers to support implementation of DERs and non-wires solutions through planning and championing solutions across communities.	The IESO is committed to helping ensure that interested parties are kept informed and are provided with opportunities for purposeful engagement to contribute to electricity planning initiatives. Throughout the IRRP process, the IESO will invite interested parties, including Enbridge, to a series of webinars and targeted outreach activities to seek input on the regional demand forecast, electricity needs, options analysis, and recommendations including the evaluation of technically feasible and cost-effective solutions. Through these engagement and outreach activities, communities and other stakeholders will have the opportunity to provide feedback and discuss the potential solutions identified.
Many participants, including City of Toronto, David Smith, Environmental Defence, OCAA, TAF, and TERRE shared support for the inclusion of a scenario in the IRRP without the Portland's Energy Centre (PEC) when evaluating the City's electricity needs.	Thank you for sharing this feedback and expressing support for the evaluation of a scenario for a future without Portlands Energy Centre to understand the options and timing that ensure a reliable and affordable supply of power to the City of Toronto.
Environmental Defence, OCAA, and TAF shared support of the June 26, 2024, City of Toronto Resolution to phase-out PEC by 2035. OCAA requested confirmation that the IESO and Toronto Hydro will develop a plan to phase-out PEC by 2035 except in emergency circumstances totalling less than 88 hours per year.	Thank you for sharing this feedback. The Technical Working Group will evaluate a scenario for a future without Portlands Energy Centre, by understanding the options and timing to ensure a reliable and affordable supply of power to the City of Toronto. More information about this scenario will be provided during upcoming milestones.

Feedback / Common Themes	IESO Response
Participants made several recommendations for evaluating a scenario without Portlands Energy Centre (PEC), including: • Citizen’s Climate Lobby recommended converting PEC into a battery storage centre. • City of Toronto recommends that needs arising as part of the phase-out of PEC should be seriously considered in this cycle to allow sufficient time to consult on the approach to meet the electricity needs resulting from the reduction of supply from PEC by 2035. • David Smith argued that PEC be reduced to peaker plant status as soon as possible. • Melanie Duckett-Wilson proposed a moratorium on gas and emitting energy generation before 2035. • OCAA proposed that the IRRP include annual interim gas reduction targets for phasing-out PEC between 2030-2034. • TERRE requested that the IESO prioritize the phase-out of PEC, inclusive of a target-date and associated milestones, and begin to implement a plan for renewable investments and conservation programs.	Thank you for providing this feedback and recommendations on evaluating a scenario without Portlands Energy Centre. A moratorium on gas generation is a matter of policy direction from the Ministry of Energy and Mines. The Ministry has designated an all of the above approach to energy policy² to help meet energy demand across the province. The Technical Working Group is, however, committed to studying the impacts of reducing reliance on Portlands Energy Centre in this IRRP and understanding the options and timing to ensure a reliable and affordable supply of power. The Technical Working Group will evaluate a scenario for a future without Portlands Energy Centre (PEC), and seek to understand possible options and timing to address a potential future without PEC, or a reduced operation of PEC, in the post-2035 timeframe to ensure a continued reliable and affordable supply of power to the City of Toronto. An alternative option will need to be in place before PEC can shut down. The IRRP will not make recommendations specifically concerning the future of PEC. As stated above, these decisions are policy decisions and outside the scope of the IRRP; however, given the uncertainty and stakeholder interest in decarbonization, this IRRP will attempt to lay out a path that aligns with community interest and preferences. More information about this scenario will be provided during upcoming milestones. The IESO is also working on a South and Central Bulk study, a broader plan that will ensure our electricity system is prepared to continue to provide reliable, affordable, and clean electricity across the province. Specifically, in the Toronto area, this bulk plan will assess electricity needs and options, including consideration of needs driven by economic

² [Ontario Ready to Meet the Challenge of Soaring Energy Demand | Ontario Newsroom](#)

Feedback / Common Themes	IESO Response
	development and decreased reliance on natural gas-fired generation from PEC.
Suggestions were shared regarding the type of information that should be provided during upcoming engagements, specifically: • John Stephensen would like to see a future presentation explain how decarbonization can be achieved if gas generation continues to be required as a back-up energy source. • Melanie Duckett-Wilson recommended that consultation with Indigenous communities must continue and suggested that the IESO accept information from independent environmental and alternative energy sources.	Thank you for this feedback on future engagement opportunities. The IESO is committed to helping ensure that interested parties are kept informed and are provided with opportunities for purposeful engagement to contribute to electricity planning initiatives such as this one. The IESO is continuously striving to enhance our engagement practices to increase opportunities for input. We will endeavour to incorporate this input into future engagements. More information about the scenario for a further without PEC will be provided during upcoming milestones.
BGO wanted to better understand how IESO planning help address distribution level capacity limitations, and whether IESO has a plan to fully decarbonize Ontario's electricity grid.	Thank you for your inquiries. To fully decarbonize while simultaneously increasing the size of our electricity system requires an orderly transition. Because no single resource can meet all of the system's needs at all times, maintaining a diverse supply mix is an effective way to ensure the ongoing reliability of Ontario's electricity system. While not an objective of the IRRP, decarbonization is being contemplated at multiple levels as part of Toronto regional planning, including: • Forecast scenarios have been developed to consider pockets of growth, alignment with TransformTO, and shift to electrification. • Electricity needs across the city will be determined based on the forecast scenarios, including through scenarios that focus on decarbonization. These scenarios will address the City of Toronto's request to reduce reliance on Portlands Energy Centre by assessing a

Feedback / Common Themes	IESO Response
	plan for a future without Portlands Energy Centre and understanding the options and timing to ensure a reliable and affordable supply of power. Recommended solutions, such as wire and non-wire options, will be assessed to ensure a reliable supply of electricity over the next 20 years, including to address the impacts of reducing reliance over the medium to long term on Portlands Energy Centre. Toronto Hydro Response: The IRRP's scope is limited to the IESO controlled grid and therefore does not extend to the distribution system. Plans and actions from the IRRP will impact the distribution system and this will be documented in upcoming Distribution System Plans from the distributor (Toronto Hydro). Toronto Hydro is planning for and working on any distribution system capacity limitations in conjunction with the IRRP.

3. Consideration and Perspectives for the Options Analysis

Feedback submissions demonstrated support for a mix of wires and non-wires solutions, including distributed energy resources and demand-side management, to be considered in the upcoming options analysis milestone of the IRRP. Feedback submissions advocated that all options, regardless of policy, be evaluated for technical feasibility to ensure the public has all the information. Feedback submissions also included desire for greater transparency in the options screening process and provided considerations for the cost-effectiveness screening test. Feedback submissions included community preference for options that promote decarbonization. Feedback on these topics is summarized below.

Feedback / Common Themes	IESO Response
Environmental Defence and TAF shared support for a mix of wire and non-wires alternatives to meet the city's electricity needs, however both	Thank you for providing this feedback. Given that the growing demand for electricity results in significant electricity infrastructure needs, the Technical Working Groups anticipates meeting

Feedback / Common Themes	IESO Response
stakeholders recommended that the IESO exert a preference for non-wires alternatives.	these needs will require innovative solutions, including non-wires and wires solutions.
Support was shared for a range of non-wires alternatives to be considered when evaluating potential options to meet the City’s electricity needs. Options included: • David Smith argued that the business case for renewable energy is strong and should be considered by the IESO to reduce gas generated electricity. He provided support for utilizing conservation, demand management, and energy efficiency as cost-effective sources of energy supply. • Mark Freeman supported potential options to meet electricity needs in the city include solar, wind, geothermal, and energy storage, with reduced reliance on gas and nuclear generated electricity. • Melanie Duckett-Wilson proposed that potential options for the city be considered through the lens of decarbonization and implementing resources such as offshore wind and solar microgrids. • NRStor Inc. is supportive of reviewing non-wires solutions to meet Toronto’s electricity needs and can support local energy needs with energy storage projects. • TAF recommended that integrating and fairly assessing non-wire solutions is very important to meet the growing electricity needs. TAF proposed that electricity needs caused by reducing reliance on PEC could be met with local renewable energy generation, energy storage capacity, energy efficiency and conservation programming, and DERs. TAF further supported that Portland’s	To ensure that Ontario’s electricity system remains reliable, affordable and sustainable, an evaluation of different options to meet the needs is a key step. Typically, as part of the regional planning process, once the forecast scenarios and needs have been finalized, the IESO will screen and evaluate wire and non-wire options, such as transmission-connected generation or storage, additional energy efficiency, distributed generation (including front-of-the-meter renewable generation) and demand response to meet the needs and consider reliability, cost, technical feasibility, maximizing the use of the existing electricity system (where economic), and community preferences. To further enhance and supplement the regional planning work underway for Toronto, the IESO is also conducting a local achievable potential study for the city to determine feasible customer-sited distribution system options to meet the needs, including behind-the-meter solar, storage, demand response, and conservation and demand management potential available to address local needs. Results from the study will be used to assess suitability of options to meet the needs of Toronto. Certain options, such as thermal networks, natural gas, hydrogen, and district energy, will be considered on a case-by-case basis and dependent on the nature of the needs until the options analysis phase. The IESO welcomes suggestions on sustainable energy system options, and feedback around community preferences around all options. The IESO notes that many stakeholders identified a desire to see offshore wind generation reconsidered despite current moratorium. The IESO is considering this feedback in the context of available wind data,

Feedback / Common Themes	IESO Response
redevelopment to explore integration of thermal energy networks and DERs at both behind-the-meter and community scales. Participants shared support for a number of specific non-wire options to be evaluated to meet electricity needs, including: • The evaluation for DERs to meet the City’s electricity needs and consideration of how to increase community adoption, specifically: ▪ The City of Toronto advocates that DERs be robustly evaluated to the meet the electricity needs of the city, and if deployed, are done so with an equity lens consistent with the goals of TransformTO. ▪ Gail Faveri expressed the view that DER’s are a reliable and cost-effective energy source for local communities. ▪ Mimico Residents Association proposed that a focus should be on supporting the adoption of distributed solar by reducing regulatory burdens, increasing subsidies, and offering training and other supports. ▪ 2078977 Ontario Ltd. echoed the sentiment that distributed solar could help meet Toronto electricity needs if administrative burdens reduced. • Consideration of EV Batteries to help off-set peak demand, specifically: ▪ Environmental Defence argues that the IESO must not rule out Vehicle to Everything options to support grid reliability. ▪ OCAA recommends that the IESO and Toronto Hydro assess the costs and	plan scope and timelines, timing and characteristics of the needs identified in the plan, and the current provincial policy. The Technical Working Group will share the options screening results that will be considered in the IRRP in upcoming engagements. The IESO will present options in upcoming engagement sessions and encourages all interested parties to attend and will ensure that a reasonable range of alternatives is considered. As planning work advances, the IESO continues to welcome views and input of communities and stakeholders, which will be considered in the development of the plan. The IESO is aware of, and actively supporting through the Grid Innovation Fund, demonstrations of vehicle-to-everything (V2X) technology. After careful consideration, V2X technology will not be explicitly considered in this IRRP, given the barriers to deploying a V2X program at a significant scale. There is high uncertainty around many input assumptions, including customer acceptance, resource availability during periods of grid stress, and capabilities of electric vehicles on the market today. As electric vehicle technologies progress, and the number of electric vehicles increases, there is time to better understand the potential for electric vehicles to contribute to grid reliability. V2X may be considered in future studies as the technology matures. The IESO welcomes further details from Enbridge Gas on how lower carbon fuels could be leveraged to support the electricity needs in Toronto.

Feedback / Common Themes	IESO Response
benefits of paying Toronto’s EV owners to provide power back to the grid during peak demand hours to help phase-out PEC and meet Toronto’s future electricity needs. • Continued and enhanced conservation and demand-side management programming to achieve energy savings at a lower cost, specifically: ▪ Environmental Defence Canada argues that current demand response and energy efficiency programs be expanded (including updates to the Ontario Building Code for residential buildings), to ensure all cost-effective conservation is pursued prior to investing in new generation infrastructure. ▪ EverGreen Energy Crop recommends that local generators, and energy efficiency options, such as insulating windows, can help reduce electricity demand. ▪ OCAA recommends that the IESO evaluate the cost-effectiveness of all energy efficiency measures, local renewable energy and storage options by comparing it to the costs of new electricity supply resources (including new nuclear reactors). ▪ 2078977 Ontario Ltd. offered that cost-effective energy efficiency programs for residential and commercial buildings within Toronto could be more cost-effective than new energy infrastructure. • Support that parking lot solar and rooftop solar be evaluated, specifically: ▪ Citizen’s Climate Lobby proposed a massive buildout of solar facilities within the city.	

Feedback / Common Themes	IESO Response
▪ Environmental Defence recommends the IESO consider parking lot solar installations and solar rooftops as a source of local clean power generation. ▪ Gail Faveri supports parking lot solar installations to help alleviate electricity needs. • Support that thermal energy storage and district energy networks be considered, specifically: ▪ Boltzmann Institute suggests that widespread deployment of district heating could reduce Toronto’s peak electricity demand for space heating. ▪ Citizens Climate Lobby and John Stephensen support the integration of thermal energy storage and district energy networks to help address energy needs. • Offshore wind should be evaluated as an option to ensure that both the public and policymakers understand what technologies are feasible and cost-effective to meet City needs, specifically: ▪ City of Toronto submits that the provincial government moratorium on offshore wind does not exclude it from consideration in the Toronto IRRP, and that assessing the potential for offshore wind electricity generation to meet City needs is within scope and allows the public to have a full understanding of the different technologies available. ▪ Environmental Defence argued that all technically feasible options should be evaluated and included the IRRP Report, specifically with respect to offshore wind. By including all technically feasible options	

Feedback / Common Themes	IESO Response
in the IRRP, it would allow policymakers to make informed decisions and address policy gaps if options meet affordability, reliability, and sustainability criteria. ▪ OCAA recommends that the IESO and Toronto Hydro assess the costs and benefits of investing in Lake Ontario offshore wind power to help phase-out PEC and meet Toronto’s future electricity needs. ▪ TERRE argues that offshore wind could cost-effectively meet the province’s electricity needs. • BGO inquired if net metering was being considered as a potential option. • Enbridge Gas recommends the TWG should consider how the Enbridge Gas system in Toronto could be leveraged to support the electric system, including on the system level (generation) and dwelling/premise level (hybrid heating). Additionally, Enbridge Gas further advocates that renewable natural gas, hydrogen, and natural gas combined with carbon capture, utilization and storage, be considered for meet long-term supply needs. • NRStor Inc. recommends consideration be given to energy storage projects and the technologies potential to facilitate community participation in the grid.	
Citizen’s Climate Lobby and Mark Freeman shared opposition to the consideration of small modular reactors to support large scale electricity generation given the high costs, unproven	Thank you for sharing preferences regarding small modular reactors. The IESO will consider this feedback as planning continues to advance. During the December 2024 webinar, the IESO shared the final forecast scenarios and shared the regional electricity needs. The IESO will

Feedback / Common Themes	IESO Response
technology and potential, and inability to ramp up in time to support closure of PEC.	present options in upcoming engagement sessions and encourages all interested parties to attend. As planning work advances, the IESO continues to welcome views and preferences of communities and stakeholders, which will be considered in the development of the plan.
Additional considerations for the process of evaluating the best option(s) to meet a need were proposed, specifically: • Citizen’s Climate Lobby offered that supply bids for potential options that meet electricity needs must meet specific economic, social and environmental constraints. • City of Toronto recommended that preferences expressed by Toronto City Council should be considered, demographic characteristics of the area where needs are identified are used to inform potential solutions, specifically with equity considerations for vulnerable populations and lower income households. • TAF recommends that non-wires solutions be evaluated for their potential to meet demand, scalability, and cost-effectiveness. • TAF recommends that to encourage decarbonization the emissions impact of all potential solutions is included and assessed.	The IESO acknowledges the importance of community preferences during the options development and appreciates these insights. This feedback will be considered as an input as planning continues to advance. System reliability cost effectiveness are the lenses through which community preferences are considered. For background, the IESO has developed a guide to the current general approach for evaluating non-wires alternatives (NWAs) during IRRPs. This guide summarizes various recent improvements made to better consider NWAs when developing an IRRP, including the process flow diagram, screening mechanism, hourly needs characterization, development of options, and economic evaluation methodology. The IESO welcomes feedback on community preferences and considerations for all options. Views and perspectives raised by the community concerning alternatives or specific attributes related to alternatives can be considered during weighing and evaluating alternatives. To ensure that the IRRP reflects the needs of the municipalities, Indigenous communities, community members and interested stakeholders, all interested parties will have an opportunity to provide feedback on the draft recommendations prior to completion of the IRRP.
The rationale for the screening of options be made available to the public, specifically: • Environmental Defence and David Smith recommended that in the IRRP Report the IESO	The IESO appreciates this feedback and is committed to an open and transparent planning process. Now that the regional electricity needs have been identified, the IESO is completing options analysis. Wires and non-wires options will be considered when addressing the needs

Feedback / Common Themes	IESO Response
provide the rationale for why potential options were screened out. TAF recommended that assumptions and methodologies for how solutions are evaluated and the criterion for selecting options is made public to enhance the transparency of the process.	found in this IRRP. Outcomes of the analysis will be shared during upcoming engagement opportunities to understand feedback and answer questions. All interested parties will have an opportunity to provide feedback on the draft recommendations prior to completion of the IRRP.
Additional considerations for the options cost-effectiveness test assumptions and evaluation process, specifically: - Cerebral Energy Advisors proposed the cost-effectiveness test should include the direct costs of ownership, separate from any government taxies, levies or subsidies that would impact net cost to consumers, to ensure an apples-to-apples economic comparison of options. - Citizen’s Climate Lobby suggests that when screening potential options that the costs of the Pickering Nuclear Plant refurbishments, and pricing mechanisms that reward wasteful energy usage be considered. - Melanie Duckett-Wilson supports a regional planning process that encourages innovative solutions, and continued OEB oversight to determine the public’s best interest. - OCAA recommends that the IESO and Toronto Hydro quantify Toronto’s cost-effective energy efficiency potential, local renewable energy and storage potential, by comparing the costs of these measures to the costs of all of Ontario’s proposed new electricity supply options, including high-cost new nuclear reactors. OCAA further argues that the cost assumptions of the nuclear reactors appear to be underestimated and recommend that they be reevaluated.	Thank you for the feedback for consideration. A guide to the cost-effectiveness test to evaluate non-wires alternatives can be found in the Integrated Regional Resource Plans: Guide to Assessing Non-Wires Alternatives, section 6. Nuclear resources were included in both the avoided energy and avoided generation capacity cost analysis. The absence of nuclear resources in the hourly marginal resource tables extracted from the avoided energy cost analysis simply reflects that in no hours did nuclear resources set the marginal price. The IESO used the National Renewable Energy Laboratories (NREL) Annual Technology Baseline (ATB) Workbook as its benchmark for nuclear, wind, solar, and battery costs in the 2024 APO. The APO was published in March 2024, with the report development conducted primarily throughout 2023. The IESO is constantly updating cost assumptions based on the latest information that is available to the IESO, and estimates for different types of infrastructure vary depending on the source, the region, and specifics of the technology options The IESO is currently working with Toronto Hydro’s local potential study consultant to include relevant distribution costs in the study’s cost-effectiveness evaluation.

Feedback / Common Themes	IESO Response
- TAF recommended that the incremental value of non-wires solutions and their ability to scale quickly be factored into the benefit-cost analysis as a tool to mitigate against stranded assets. Further added, that the cost-effectiveness test includes avoided distribution costs. 2078977 Ontario Ltd. proposed that the IESO narrow the scope of options in the planning process to cost-effective sources only.	
Consideration be given to community preferences to phase-out gas generation locally, and meet decarbonization and net-zero targets at both the local and federal levels, specifically: - City of Toronto stated that the expressed preference of the Toronto City Council be considered as a community preference criterion when evaluating options, including: TransformTO Net Zero Strategy, and council decisions that support electrification of buildings and transportation sectors, clean grid with little to no natural gas generation beyond 2025 and increasing uses of DERs. - Gail Faveri expressed the goal of the IRRP should be low-cost reliable electricity that avoids oil and gas combustion in its production. - Mark Freeman believes the IESO should prioritize lowering the provinces GHG emissions, prioritize distributed renewables and storage options, and DER programming. - Melanie Duckett-Wilson and Mark Freeman expressed desire for the Toronto IRRP to help support Ontario's commitment to the Canada's 2015 Paris Agreement targets by reversing emissions caused by gas electricity generation.	The IESO welcomes the views and preferences of communities and stakeholders, which will be considered in the development of the plan. The IESO understands there is community preference for affordable decarbonized electricity in the City of Toronto. While not an objective of the IRRP, decarbonization is being contemplated at multiple levels as part of the regional planning process for Toronto, including: - Forecast scenarios have been developed to consider pockets of growth, alignment with TransformTO, and shift to electrification. - Electricity needs across the city will be determined based on the forecast scenarios, including through scenarios that focus on decarbonization. These scenarios will address the City of Toronto's request to reduce reliance on Portlands Energy Centre by assessing a plan for a future without Portlands Energy Centre and understanding the options and timing to ensure a reliable and affordable supply of power. - Recommended solutions, such as wire and non-wire options, will be assessed to ensure a reliable supply of electricity over the next 20 years, including to address the impacts of reducing reliance over the medium to long term on Portlands Energy Centre.

Feedback / Common Themes	IESO Response
- Mimico Resident's Association wants to see accelerated decarbonization plans and is interested in supporting DER adoption within their community. - TAF summarized there is a strong community preference for reduced reliance on PEC, as indicated by the City of Toronto's Resolution to phase out PEC, TransformTO's net zero emission targets, and the establishment of TERRE by local residents.	The IESO is also conducting a local achievable potential study in Toronto to determine the amount of energy efficiency and behind-the-meter distributed energy resource opportunities, including thermal storage, available to address local needs. Results from the study are expected in 2025, and the results will be considered as part of the regional planning process.

4. General Comments

Feedback submissions included proposals for rate reform and procurement practices to promote implementation of non-wires alternatives and lowering emissions. Other comments highlighted the potential health impacts due to emissions from the Portlands Energy Centre, and questioning the total emissions impact of Ontario's electricity system.

Feedback / Common Themes	IESO Response
Rate-setting methodology inquiries, removal of electricity subsidies, and pursuing rate reform that lowers emissions, including: - Cerebral Energy Advisors inquired on rate-setting methodology for transmission infrastructure investments across the province - David Smith provided his opinion that the Ontario government electricity subsidy skews the market and hides the true cost of electricity, thus undermining the incentive for consumers to conserve energy. - John Stephensen proposed that the OEB and LDCs should consider rate reform to maximize potential of smart meters, lower consumer energy costs and emissions.	In Ontario, the Ontario Energy Board (OEB) is responsible for protecting consumers and making decisions that serve the public interest. The OEB would review and approve LDC rate applications and electricity infrastructure based on key criteria, including whether project need has materialized. Cost responsibilities are outlined in the distribution and transmission system codes found on the OEB's website. For opportunities to participate and engage with the OEB on current projects or initiatives, please visit the OEB Engage with Us website.

Feedback / Common Themes	IESO Response
NRStor recommended the prioritization and establishment of a procurement process to secure non-wire projects that provide multi-grid services for bulk, regional and distribution level recommendations. Additionally, NRStor also recommended more customer participation in this process.	Thank for this feedback and recommendation. As part of the regional planning process, implementation mechanisms for non-wire solutions for new resources will be determined following plan publication. Provincially, the IESO has developed the Resource Adequacy Framework which sets out a long-term competitive strategy to acquire resources while balancing ratepayer and supplier risks and recognizing the unique characteristics and contributions of different resource types. Designed to facilitate the transition to a more competitive procurement environment and better aligning acquisitions with evolving needs, the framework incorporates the mechanisms that will be used to purchase capacity in all time frames: short, medium and long term. To maximize competition, acquisition mechanisms are expected to be open to all resource types that meet eligibility requirements. Engagement on these procurements is in various stages, and more information can be found on the IESO's website.
OCAA disputed the IESO's September 5th Response to Feedback, that Ontario's electricity system is entering a period of need and is already more than 90 per cent emissions-free, with most of its electricity coming from non-emitting resources, like hydro and nuclear.	Ontario's electricity system today is almost 90 per cent emissions-free as a result of a decarbonization journey that's been two decades in the making. The IESO has overseen this transformational change, beginning when Ontario became the first jurisdiction in North America to remove coal from its system, replacing it with nuclear, hydroelectric, natural gas, wind, solar and biofuel. Flexible natural gas supply was critical in helping the IESO comply with reliability standards. During this period, the IESO developed its understanding of the operating characteristics of natural gas generators and how the resource could be effectively deployed to facilitate the

Feedback / Common Themes	IESO Response
	integration of large amounts of intermittent renewable generation on Ontario's electricity system.
TAF and Environmental Defence highlighted that PEC's emissions pose significant health risks to nearby residents, and therefore the City's vision for Toronto's waterfront to include residential development is incompatible with the long-term operation of PEC.	Thank you for this feedback. The IESO is having on-going discussions with the City of Toronto to understand and incorporate the findings from the city's Portlands Redevelopment Study into the IRRP. This study will include developing a demand model that will evaluate the potential of integrating thermal energy networks and Distributed Energy Resources at both behind-the-meter and community-scale to ensure a low-carbon and resilient energy system. Findings from these discussions and the study will be considered in the IRRP when developing options to address the local electricity needs driven by the Portlands redevelopment.
OCAA requested a percentage break-out of resource types from 2025-2050 from the IESO's 2024 Avoided Energy Costs estimates.	For more information related to the IESO's most recent Avoided Energy Costs, please visit Table 1: Avoided Energy Costs housed in the IESO's Planning and Forecasting webpage.

Local Achievable Potential Study (L-APS)

1. Considerations for the L-APS Scope

Feedback / Common Themes	IESO Response
The following energy solutions were recommended to be considered in scope, specifically: - City of Toronto and Environmental Defence recommended that vehicle-to-grid and vehicle-to-everything be included. - Enbridge Gas is interested to engage with the IESO on how or if gas data could be	Thank you for providing this feedback. All measures that can be successfully deployed and function as intended will be considered technically feasible and included in the technical potential scenario. From there, technically feasible measures will be screened for cost-effectiveness and only measures that pass this

Feedback / Common Themes	IESO Response
incorporated into the L-APS scope, considering the provinces direction for enhanced energy coordination and the “one-window” approach for demand-side management programming. - Environmental Defence recommends that all clean energy technologies that are technically feasible be considered in scope and to not exclude potential energy solutions due to policy or regulatory barriers. - Mark Freeman proposed that the L-APS should only consider solar, wind, geothermal, and green energy storage solutions. - Melanie Duckett-Wilson proposed that geothermal microgrids and offshore wind be considered in scope. - NRStor Inc. recommends behind-the-meter and front-of-the meter standalone and hybrid batteries be included in the Technical Potential measure list. - OCAA requested confirmation that the L-APS scope will evaluate the potential for local stationary and mobile (i.e., electric vehicle) batteries.	test will be included in the economic potential scenario and achievable potential scenario. The IESO is aware of, and actively supporting through the Grid Innovation Fund, demonstrations of vehicle-to-everything (V2X) technology. After careful consideration, the IESO will not include vehicle-to-grid (V2G) technology as a measure in the L-APS given the barriers to deploying a V2X program at a significant scale. There is high uncertainty around many input assumptions, including customer acceptance and resource availability during periods of grid stress. At present, the IESO does not have confidence that a large-scale V2X program could be implemented successfully due to major barriers to implementation, such as high-costs, limited availability of V2G capable vehicles and charging equipment, and challenges with equipment and control system interoperability. Behind-the-meter options, including solar and batteries, are being explored through the L-APS. However, hybrid batteries will not be considered as a distinct measure in the L-APS to avoid duplication in potential calculations. Front-of-the-meter options are evaluated as part of the regional planning process. The IESO welcomes the opportunity to work with Enbridge Gas to discuss further feedback on the L-APS assumptions.

2. Considerations for L-APS Methodology

Feedback / Common Themes	IESO Response
Recommendations for the Technical Potential scenario methodology, specifically: NRStor Inc. recommends that in the Technical Potential that the capped network	Thank you for providing this feedback. The network hosting capacity will be applied at the achievable potential level, not the technical potential level. The DER hosting capacity constraints will reflect the latest information

Feedback / Common Themes	IESO Response
hosting capacity considers future improvements to the system to enable more capacity and the ability to implement NAWs to increase capacity. Recommendations for the Economic Potential scenario methodology, specifically: • Environmental Defence recommended that the cost-benefit test for the economic potential be adjusted to factor in emissions reduction costs. • Environmental Defence further requested that the IESO clarify if it is more cost effective to upgrade the network hosting capacity to accommodate more DERs, than continue investments into fossil fuel infrastructure that increase risk of stranded assets. • Mimico Residents Association recommended that economic assumptions underpinning renewable energy solutions be estimated on a best-case scenario, and that healthcare costs imposed by air pollution from the Portland’s Energy Centre be factored into the economic test. • NRStor Inc. recommends that in the Economic Potential scenario, that avoided costs to the transmission and distributions systems, be included in the analysis. • NRStor Inc. recommends that the revenue streams for DERs be stacked to influence the economic value of DERs, and that the potential for DERs to alleviate upstream congestion and provide resiliency benefits to the grid, be captured in the economic test.	from Toronto Hydro on current and planned hosting capacity. By applying the hosting capacity constraints at the achievable potential stage, visibility is provided to how hosting capacity and customer adoption factors impact the quantity of technically feasible economic potential, and the room to grow achievable potential with potential future distribution network enhancements. The L-APS will use the program administrator cost test (PAC Test) to assess the cost-effectiveness of measures. This aligns with the current methodology the IESO uses to screen and evaluate electricity DSM programs. The PAC Test compares the program administrator costs incurred to design and deliver programs against the avoided electricity supply-side resource costs and the avoided transmission costs (from the perspective of the program administrator). The PAC Test does not reflect emissions reduction costs or resiliency benefits. However, community preferences may be qualitatively considered in the Options evaluation of the IRRP. The IESO is currently working with the Toronto and Ottawa LDCs, and their local potential study consultant, to include relevant distribution costs in the study’s cost-effectiveness evaluation. The L-APS includes improvement in the efficiency of certain technologies, as well as decreasing costs over time. Some stacked revenue streams are considered at the achievable potential level. The IESO will quantify all measures using NREL’s Annual Technology Baseline (ATB) 2024 and ICF’s Potential Study Database. Technology adoption is based on both past performance as well as future expectations. Per standard achievable potential study and technology adoption forecasting practice, the L-APS consultant will use Bass diffusion curves that inherently account for future adoption rates

Feedback / Common Themes	IESO Response
- OCAA requested confirmation that the L-APS will quantify all of Toronto's conservation and demand-management potential, and solar and storage opportunities at a lower cost than conventional supply options. - TAF recommends that province-wide and local avoided costs associated with DERs and energy efficiency are included to understand the overall system benefits. TAF further recommends that DERs and energy efficiency be evaluated for their ability to: reduce peak demand and improve grid reliability; defer or avoid infrastructure investments; enhance resiliency; support equitable energy access and reduce energy costs for residents. Recommendations for the Achievable Potential scenario methodology, specifically: - Enbridge Gas noted that the high electrification scenario for the L-APS is based on Canada's Energy Future 2023 Net Zero Scenario, and the Toronto IRRP high electrification scenario is based on Toronto's TransformTO targets. Enbridge Gas recommends the IESO include in the L-APS a comparison of these electrification scenarios to show their differences and how they may be reconciled. - Environmental Defence recommended that past adoption rates should not be used as a predictor of future adoption rates, given the pace of the energy transition and changes to public interest in climate solutions and affordability, and that adoption rates from comparable jurisdictions be used. EDC further proposed that the study include a	when calibrated to the past adoption, and projected market expansion. Comparison of the economic and achievable scenarios can provide some indication for additional potential for higher adoption under different factors. The Toronto IRRP Forecasting Methodology used for the high electrification scenario is based on Toronto's TransformTO strategy and targets, while the L-APS consultant modeled the high electrification scenario based on the Canada's Energy Future 2023 Canada Net-Zero Scenario for the Local Achievable Potential Study. While both strategies aim to achieve net zero GHG emissions, they differ in their timelines, approaches, and geographic coverage. The main difference between the two strategies is the timeline to reach net-zero. To reconcile this difference for Toronto Hydro, the L-APS consultant will accelerate the decrease of the Canada Energy Future's 2023 Canada Net-Zero Scenario's natural gas energy usage so that it reaches 2050 usage level by 2040.

Feedback / Common Themes	IESO Response
scenario with policy-driven accelerations of adoption rates. NRStor Inc. recommended that the Achievable Potential consider projected market expansion of DER measures, and capacity building for the DER trades industry.	

3. Consideration for the Potential Uses of the L-APS

Feedback / Common Themes	IESO Response
Recommendations for the Achievable Potential scenario methodology, specifically: - Environmental Defence and TAF recommend that an accessible version of the L-APS study be made publicly available, inclusive of publishing the Study's assumptions, so that L-APS findings can be used by external stakeholders to inform other housing, environmental, climate, and youth planning activities. - NRStor Inc. recommends the L-APS provide temporal and locational nodal price signals that can help guide the values for non-wires and distributed energy resource (DER) options. - NRStor Inc. suggested that the scenarios of the L-APS could be used to inform programming designed to support the economics of DER installation. - NRStor Inc. suggested that similar local integrated demand-side management and DER potential studies be commissioned on a regular basis to help inform the province's	Thank you for providing this feedback. The IESO will publish a detailed description of the methodology, data sources, input assumptions and data tables that can be shared publicly. Any propriety data will be excluded. Thank you for the recommendation. With the launch of the renewed wholesale energy market on May 1, 2025, Ontario will transition to having temporal and locational price signals. The IESO agrees that the results of the L-APS could be used to inform DER programming. The Ministry of Energy and Electrification (MOEE) directed the IESO to launch a new 12-year electricity Demand Side Management Framework (eDSM) and undertake provincial-scale achievable potential studies (APS) on a regular basis. The provincial achievable potential studies will include behind-the-meter distributed energy resources. The next provincial APS study will be published in 2026. These studies will be used to inform eDSM programming, to help address province-wide, regional or local system needs.

Feedback / Common Themes	IESO Response
demand outlooks and resource adequacy plans, and associated program budgets.	

4. Additional Sources or Trends to Consider in the L-APS

Feedback / Common Themes	IESO Response
- Environmental Defence included links to the following resources from other jurisdictions: - Berkeley Lab's analysis of solar-adopter demographic characteristics - Vermont's home battery incentive program - California's combined solar + storage program - Study of the adoption of rooftop solar photovoltaic panels in the UK - Prince Edward Island (PEI)'s significant increase in heat pump adoption thanks to targeted government programs - The oversubscription of the Canada Green Homes Grant, which demonstrated the public appetite for energy efficiency solutions when supported to address financial barriers - NRStor Inc. recommended that the technology adoption curve for batteries should consider the CSA C22:1:24 (26th edition).	Thank you for providing this feedback. The IESO will take this into consideration.