# Integrated Regional Resource Plan: Toronto Region
# May 22, 2019 Community Engagement Meeting
# Meeting Summary

**Meeting materials and recording:**
http://www.ieso.ca/Sector-Participants/Engagement-Initiatives/Engagements/Integrated-Regional-Resource-Plan-Toronto

**Presenters:**
Mr. Ahmed Maria, Director, Transmission Planning, IESO
Ms. Beverly Nollert, Manager, Transmission Planning, IESO
Mr. Steven Norrie, Senior Planner, Transmission Integration, IESO

**Meeting Facilitator:** Susan Harrison

Ms. Susan Harrison, Supervisor of Regional and Community Engagement, IESO welcomed everyone to the meeting. She acknowledged a diverse group of participants in attendance in person and over the phone, including generators, municipalities, service providers, consultants, government agencies, utilities, and consumers. She encouraged everyone to share comments both during the meeting and in writing following the meeting.

Introduction

Mr. Ahmed Maria acknowledged that the meeting is taking place on the traditional land of the Anishinabek, Haudenosaunee, and Wendat peoples. The land is covered by the Toronto Purchase Treaty No. 13 between the Crown and the Mississaugas of the Credit.

In early 2016, the IESO produced a regional electricity plan for the Toronto area. A new plan is now being produced for the region. The plans are produced by the Technical Working Group consisting of Hydro One, Toronto Hydro, and the IESO. These three organizations are responsible for ensuring the reliability of Toronto's power system. The draft plan is informed by feedback from stakeholders and communities including the City of Toronto, business organizations, and local community members prior to the plan being finalized.

The goal of planning is to identify the electricity infrastructure that will be required during the next 20 years. To do this effectively, it is important to understand how electricity will be consumed in the region. The Integrated Regional Resource Plan (IRRP) engagement meetings

provide an opportunity to gain that understanding through discussions within the meeting and comments submitted afterward.

Due to recent and ongoing investments in its infrastructure, Toronto is in good shape for the next 10 years. Needs have been identified in the 10-20 year timeframe, and now is time to start a dialogue on how to address these long-term needs.

Mr. Maria showed a video to illustrate how the IESO is engaging with power consumers across the province.

Ms. Harrison said the IESO is committed to engagement, especially community engagement, through the regional planning process. This is the second formal cycle for regional planning. A stakeholder survey in 2017 identified ways for continuous improvement in the IESO's engagement approach for regional planning: demonstrating more transparency in decision-making; setting better expectations and scope for input; providing more education and background early in the process; identifying and analysing stakeholders to provide opportunities for input; providing more tools to enable broader engagement; and, enhancing relationships for continuous dialogue. The IESO has incorporated this feedback into this second cycle of regional planning.

In addition, a regional electricity network will be launched this year to support continuous discussions among stakeholders and communities – beyond regional planning activities. Networks will be established across the five regions in Ontario with an aim to maximize a variety of tools to engage with interested parties on electricity matters in each region.

Participant surveys will continue in order to identify continuous improvements in the IESO's engagement processes.

Overview of the IESO and Regional Planning

Ms. Nollert said the IESO operates the electricity system 24/7 to ensure its reliability. The IESO is involved in planning to ensure the province's electricity needs are met in the near, mid and long term periods. The IESO also works to support innovation, energy efficiency and is driving toward market efficiencies through its market renewal initiative, and engages with communities.

As of December 2018, Ontario has 36,928 MW of installed capacity. This is the total capacity of facilities able to supply electricity. The province's record summer peak of 27,005 MW was set on August 1, 2006. A record winter peak of 24,979 MW was set on December 20, 2004. Ontario as a



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whole is typically a summer-peaking province and the system must be designed to meet these peak demands.

In 2018, Ontario consumed 137.4 TWh of electricity. Ontario has approximately five million customers and 30,000 km of transmission lines. The province has been divided into 21 planning regions and has an import/export capability of 6,500 MW/6,100 MW via interties with our neighbours.

Ms. Nollert explained three levels of planning. The purpose of regional planning is to assess the capability of the 230- and 115-kV portions of the transmission network that supply electricity to each of the 21 regions. Specifically, the plans look at the region's facilities that supply the load to connected customers via the transmission system. The key players in the planning process are transmitters, local distribution companies (LDCs), the IESO and communities. Regional plans are produced every five years, and can be produced sooner when deemed necessary.

Bulk system planning entails looking at the 500- and 230-kV portions of the transmission system that transfers electricity from the generators to the load centres and to neighbours via interties. Bulk system planning incorporates policy direction such as decisions on the nuclear fleet and renewable integration.

Distribution system planning is carried out by the LDCs according to local needs. While the planning processes are distinct, there are opportunities to identify and provide integrated solutions.

Ontario's 21 planning regions are based on electricity infrastructure boundaries, each with distinct needs. The first step in the regional planning process is a needs assessment, led by the transmitter. Information is gathered and a list of regional needs is determined. The needs assessment is posted publicly within 60 days of its inception. The second step is a scoping assessment, led by the IESO. The list of needs is examined to determine how best to address them. The outcome of the scoping assessment is posted publicly for input from stakeholders and communities and finalized within 90 days of its inception. One possible outcome might be a recommendation to address needs through an integrated regional resource plan (IRRP), a regional infrastructure plan (RIP), or local planning. Needs that could be addressed by distributed energy resources (DERs) or energy efficiency, require regional coordination and/or stakeholdering with the community are likely to proceed to an IRRP. Those needs that can only be solved through wires solutions do not have broader regional impacts or require regional coordination are likely to feed directly into a regional infrastructure plan (RIP) or a local plan led by the transmitter.



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The assessments for the previous and current cycles of planning for Toronto are posted on the IESO website as follows:[1]

Needs assessment: https://www.hydroone.com/about/corporate-information/regional-plans/metro-toronto

Scoping assessment: http://www.ieso.ca/Get-Involved/Regional-Planning/GTA-and-Central-Ontario/Toronto.

If the outcome of the scoping assessment is to go to an IRRP, updated data are gathered for a technical study to identify needs. These data include historical demand, distributed generation, conservation and demand management, demand forecasts, conservation plans, asset end-of-life information, and community input. System capability and planning standards are applied through the planning process to determine the short-, mid- and long-term needs. Options are evaluated with respect to cost-effectiveness and technical capability. Finally, recommendations are made. These may be investment recommendations for near-term needs, or actions that need to be taken to refine options where there is enough time to collect information and develop solutions for future consideration.

Toronto's Electricity System Outlook

Mr. Norrie explained that the electricity infrastructure must be sized to deliver enough capacity, measured in megawatts, to meet the peak demand of an area. The integrity of the system is tested in terms of how the system will respond when there is a sudden event, such as when trees come in contact with transmission lines. These contingencies that are used to test the electricity system are described in an IESO document called the Ontario Resource and Transmission Assessment Criteria (ORTAC).

Because Toronto's population is large and dense, a high standard of performance is required, whether the transmission facility is a bulk power facility or serves only the local area.

Planning is an ongoing process for Toronto. The planning document (IRRP) is released every five years, but regional planning can be initiated sooner when there are changes in the baseline assumptions. Engagement is an important part of the process.

[1] Transmitter-led regional plan documents, such as Needs Assessments and Regional Infrastructure Plans, are posted on Hydro One's website.



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Mr. Norrie noted that Toronto's regional plan includes everything within the municipal boundaries of the City of Toronto. There are several transmission stations outside of Toronto that supply electricity at the 230-kV level lines and deliver bulk power into the city.

Toronto is heavily reliant on transmission to bring power from the interconnected grid to supply the 35 transformer stations throughout the city. Generation resources within the city can supply some (approximately 15%) of Toronto's peak demand.

Toronto's transmission system has two areas: a 115- kV central area that conforms to the old city prior to the 1998 amalgamation, and a 230-kV horseshoe area. The central 115-kV area is the planning focus because this is where most of Toronto's growth has been, and where the oldest electricity transmission assets are located.

The central Toronto area is supplied by two main transformer stations: Leaside and Manby transformer stations. One generator, the Portlands Energy Centre on the waterfront, connects to the Leaside sector. The Leaside and Manby sectors operate independently; however, loads can be transferred between them if there is a power interruption. Despite this very flexible power supply, some issues were identified in the previous plan that are being addressed.

The investments that were identified in the previous plan include:

1. A remedial action scheme to address the risk of some specific, rare contingencies at the Manby station was recommended, such as for the event of a circuit-breaker failure. This scheme will be in service later this year.
2. Expanding the Runnymede and Horner transformer stations to relieve station overloads. The Runnymede expansion went into service in 2018 and will allow for the new Eglinton crosstown light rail transit system to connect, while the Horner expansion is set to come into service in 2021 and will allow for future growth in south Etobicoke.
3. The 230-kV supply corridor from the Richview transformer station to the Manby transformer station needs reinforcement. This 6.5-km stretch of bulk transmission line serves much of central Toronto, south Etobicoke, and Oakville. Hydro One plans to initiate community engagement for the environmental assessment this year.

Continuous investments in the electricity system have also been made in Toronto in the last 15 years. These investments in system reinforcement, energy efficiency, distributed energy, and asset renewal have ensured that the grid keeps pace with new customers seeking connection to the grid, and that the regional transmission system meets or exceeds the required standards of performance.



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Toronto's current electricity demand outlook, as developed by Toronto Hydro, was reviewed by the Technical Working Group and accepted as the foundation for assessing future needs. In December 2017, a discussion about Toronto's future needs took place at the MaRS facility. This discussion informed the demand outlook, and the City of Toronto provided its growth projections, including population and employment. The outlook also factors in the city's policy objectives for the future electrification of fossil fueled end uses such as space heating, water heating, and transportation. The impacts of energy efficiency programs, specifically under the Conservation First Framework, are included.

Moderate peak demand growth is expected for Toronto over the long term. The drivers behind this growth are increasing population and employment and end-use electrification. We assume there will be continuing gains in energy efficiency and continuing growth in DERs, including behind-the-meter generation and energy storage. Our assumptions for electrification do not result in significant peak demand increases as electric vehicles will be driven toward off-peak charging, and space heating is mainly geared to winter peaks.

The current plan does not recommend any immediate capacity- or reliability-driven investments. Future electrification can be accommodated largely with the system and infrastructure that is currently in place.

In the next five to 10 years, assets will be reaching the end of their lives. These include transformers and their associated equipment, overhead line sections, and underground cables. The transmission facilities reaching their end of life are mainly located in central Toronto. These facilities are important parts of the supply pathway to customers in Toronto. There is a need to renew critical assets that are reaching the end of their lives, rather than retire them, and the plan is focused on like-for-like replacement. Capacity improvements can result by replacing old equipment with modern-day equipment. There is also a plan to incrementally increase the size of the Main transformer station that supplies the east Danforth and Beach neighbourhoods.

With respect to assets reaching their end-of-life, in future plans it will be important to look farther out in order to keep the option of doing something different with the infrastructure.

During the early-to-mid 2030s, local capacity constraints are expected, affecting the Strachan, Basin, Wiltshire, Manby and Leslie transformer stations. Four of these five stations are in central Toronto. These needs will require close monitoring of demand growth, community development, and efficiency gains on an annual basis.

In 2040, regional capacity constraints are starting to emerge, affecting the Leaside transformer station. With respect to the regional capacity needs this far out on the horizon, sufficient lead



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time is available to plan to address them. Today's system would be challenged to restore some loads within an eight-hour timeframe in the event of the 230-kV system being impacted by some rare contingencies. This may require load transfers to alternate supply points or nearby transmission facilities.

The IRRP Toronto engagement initiative is available at http://www.ieso.ca/Sector-Participants/Engagement-Initiatives/Engagements/Integrated-Regional-Resource-Plan-Toronto.

Comments

A participant asked how the planning process takes into account the requirements for electric vehicle charging in Toronto's downtown area and if there is an opportunity to supply battery storage or capacity to the grid. Mr. Norrie replied that these opportunities are on the IESO radar and will be explored when a sufficient number of electric vehicles arrive. The IESO does not make explicit assumptions on electric vehicles as a grid resource.

A participant asked how storage is considered in the plan. Mr. Norrie replied that storage is treated in two ways: as a load modifier as part of the demand outlook, and as a potential resource option that is available to help address long-term needs.

A participant asked what data were used to predict a 20% increase in energy demand in the next 20 years. Mr. Norrie replied that the prediction is based on the City of Toronto's projections for employment and population growth. As well, end-use electrification as a result of decarbonization and greenhouse gas mitigation policies are factored in.

A participant said within the food industry there have been issues with power quality. It has become important to look at marginal losses and address them first. He asked if there are opportunities for big consumers to shift their loads and also to look for ways to identify load management systems. Mr. Humphrey Tse, Resource Planning Group, IESO replied that the IESO does look for ways to make large users more efficient, and program system upgrade initiatives are available to them. He noted that program delivery is not included in the outlooks assumed in previous IRRPs.

A participant asked how demand response is taken into consideration within the plan. Mr. Norrie said the Industrial Conservation Initiative (ICI) is accounted for in the forecast; however, other demand response initiatives may be treated on the solutions side and not included in the forecast.

A participant asked if the IESO is only considering demand response auction participants that are above 10 MW. He asked what is the role of Toronto Hydro in demand response. Mr. Tse



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said the sizing for the new auction is a minimum of 1 MW, not 10 MW. Toronto Hydro has made applications to the Ontario Energy Board to run a localized demand response program to address local station capacity needs. The IESO is looking to find other non-wire alternatives that can participate in a market-based future.

A participant asked what the total load capacity is for the province in 2019. Ms. Norrie said it is approximately 23,000 MW, which is much lower than it was in 2006. The challenge is to look not just at total demand, but where the demand is coming from. The global system is good, but within it are pinch-points. Issues are not visible when the system is viewed in aggregate.

Engagement and Next Steps

Ms. Harrison said feedback from today's meeting is requested by June 7 at engagement@ieso.ca. At the end of June, the IESO will post and respond to the feedback and communicate proposed plan recommendations for further comment.

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