



April 21, 2017

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Dear Mr. Wasik and Mr. Young,

Re: Initiating an infrastructure project for addressing electricity needs in the Markham-Richmond Hill area

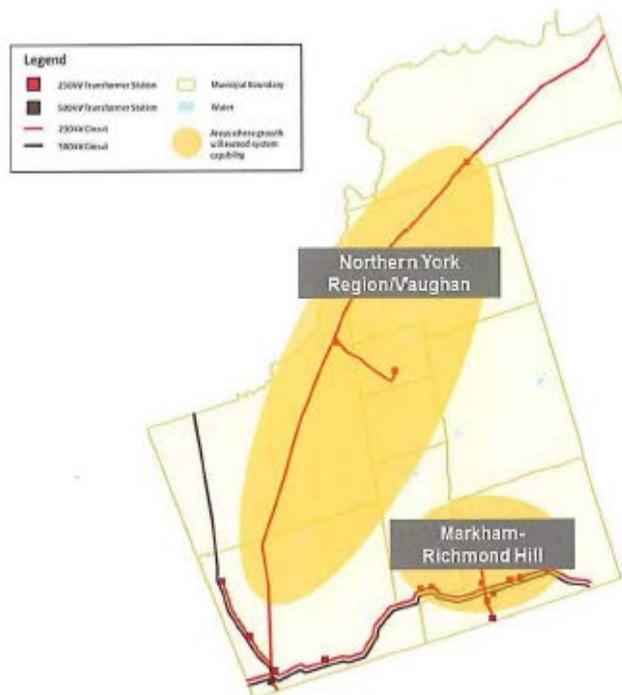
The purpose of this letter is to:

- confirm the need and the scope for the project to address the near-term electricity needs in the Markham-Richmond Hill area; and
- recommend that Alectra Utilities (formerly PowerStream) and Hydro One Transmission proceed with the work leading to the implementation of a new transformer station in the City of Markham and the associated distribution and/or transmission lines.

A regional planning Working Group for York Region, consisting of the Independent Electricity System Operator (IESO), Newmarket-Tay Power Distribution Ltd., Alectra Utilities and Hydro One Transmission and Distribution, has been active since 2011. In 2013, the planning process was restructured to conform to the timelines and requirements of the Ontario Energy Board's (OEB) formalized Regional Planning Process. In April 2015 the IESO released an Integrated Regional Resource Plan (IRRP) for York Region, documenting a 20-year plan developed by the Working Group. That plan provided forecasts of electricity demand growth in the region, identified electricity needs and priorities, discussed potential solutions, recommended near-term actions, and laid out longer-term supply and demand outlooks for the region. In February 2016, Hydro One Transmission completed a Regional Infrastructure Plan (RIP) as a subsequent step in the regional planning process.

Consistent with the findings from the IRRP and RIP, even with the implementation of the near-term actions and on-going conservation efforts identified in the 2015 York Region IRRP, electricity demand growth is expected to exceed the system capability in two areas over the next 10 years: Markham-Richmond Hill in the early 2020s and Northern York Region/Vaughan in the mid-2020s. These areas are shown in Figure 1 below.

Figure 1. Remaining Needs in York Region.



This letter focuses only on near-term electricity needs in the Markham-Richmond Hill area. Since the need in the Northern York Region/Vaughan area is not expected to arise until mid-2020s, there is still time before a decision on infrastructure investments need to be made for that area. In the interim, the Working Group will continue to work with communities and the Local Advisory Committee (LAC) established in 2015, to explore options that may address the identified needs in the Northern York Region/Vaughan area.

Electricity Demand Growth in the Markham-Richmond Hill area

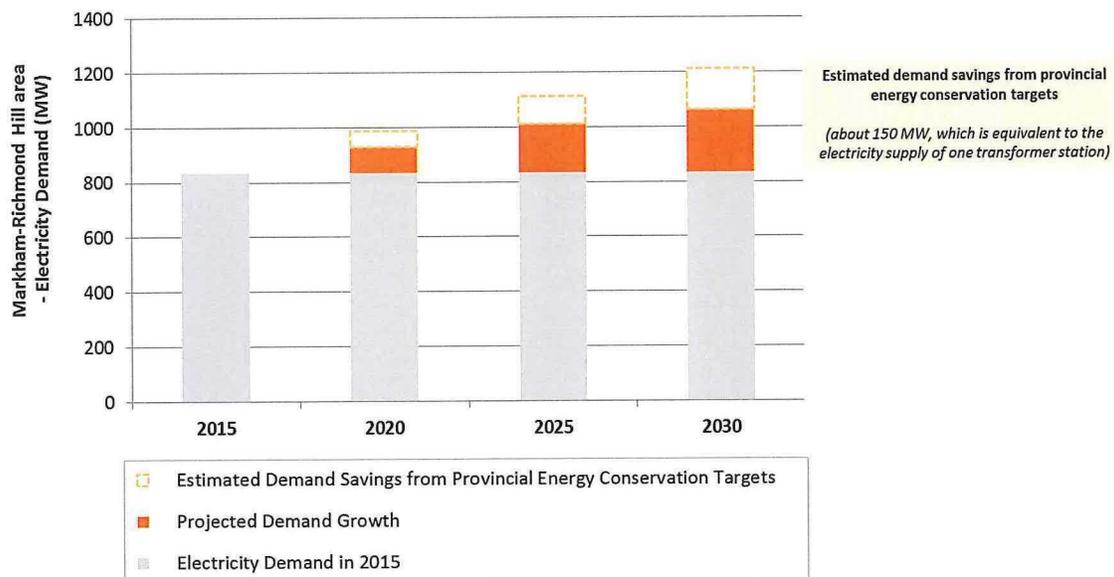
The electricity demand in the Markham-Richmond Hill area peaked at 833 megawatts (MW) in the summer of 2015. Alectra Utilities, the local distribution company which serves customers in the City of Markham and the Town of Richmond Hill, is forecasting robust electricity demand growth for this area. This forecast is consistent with the City of Markham and Town of Richmond Hill's development plans and growth assumptions. Some of these growth areas include the Markham Future Urban Area (FUA)¹, the Buttonville Airport redevelopment, new data centres in Markham and Richmond Hill as well as intensification along the Highway 404 corridor and Yonge Street. Activities associated with electrification, such as shifting from natural gas to electric-power heat pumps, adoption of electric vehicles and electrification of public transit would, if they occur, further increase the electricity demand in this area.

Implementation of the province's conservation initiatives, including provincial conservation energy targets, is helping to manage demand growth across Markham and Richmond Hill. The forecast used for this planning study assumes that roughly 40 percent of growth (approximately 150 MW, which is equivalent to the electricity supply of one transformer station) in the Markham-Richmond Hill area will be met by increased efficiency, time-of-use savings, and conservation programs. Peak demand impacts

¹ For more information about the Markham Future Urban Area (FUA), please refer to the City of Markham website: <https://www.markham.ca/wps/portal/Markham/MunicipalGovernment/AboutMunicipalGovernment/MajorCityProjects/NorthMarkhamFutureUrbanArea/>

associated with the aggressive conservation targets established in the 2013 Long-Term Energy Plan were assumed before identifying the residual planning forecast, which is shown in Figure 2, below.

Figure 2. Markham-Richmond Hill Planning Forecast.

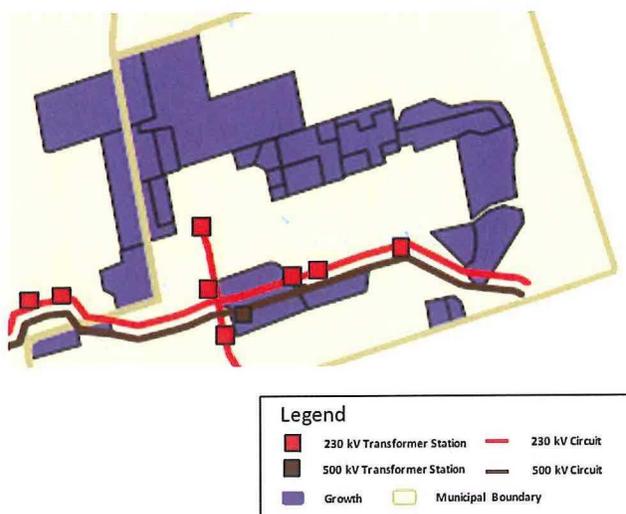


Source: 2015 York Region Integrated Regional Resource Plan (IRRP)

In addition to new building codes and efficiency standards, a number of conservation efforts and pilots outlined in Alectra Utilities' Conservation and Demand Management Plan are already underway to help achieve provincial energy conservation targets. However, even after these conservation efforts, peak demand in the Markham-Richmond Hill area is expected to increase by about 100 MW over the next five years. As shown in Figure 2, strong and continued growth in this area will further increase the peak demand over the next 15 years.

Adequacy of Existing Supply to Markham-Richmond Hill

Figure 3. Electricity Supply to the Markham-Richmond Hill area.



Today, much of the Markham-Richmond Hill area's demand is supplied from the provincial grid. The electricity generated from provincial resources is delivered to the Markham-Richmond Hill area through the 230 kilovolts (kV) high-voltage transmission network along Highway 407, as shown in Figure 3. From the 230 kV high-voltage transmission network, power is delivered from eight transformer stations to 27.6 kV distribution systems that service various communities and customers in this area.

In addition to the electricity supply from the provincial grid, there are also distributed generation facilities located in this area, including combined heat and power facilities (e.g., Markham District Energy) and a number of solar generation facilities. These distributed generation facilities provide a local source of supply to the community. It is estimated that these local generation facilities contribute about 15 MW at the time of local peak.

Electricity demand growth is expected to exceed the capability of the electricity system supplying Markham-Richmond Hill starting in the early 2020s. The supply gap is forecast to increase at a rate of 10-15 MW per year. In addition, as shown in Figure 3, a large portion of the future electricity demand growth is driven by new developments and future urban areas located in northern parts of the Markham-Richmond Hill area, where there is limited access to existing transmission and distribution infrastructure. Based on the needs associated with the forecast demand, a solution will need to be in place by the early 2020s to ensure there is a reliable source of electricity supply to support the continued growth in the Markham-Richmond Hill area.

In September 2015, the IESO initiated a community engagement process for York Region by forming a LAC consisting of 16 volunteers from the community. Five meetings have been held thus far to discuss the issues identified in the Markham-Richmond Hill area, and both comments and advice have been received from the committee. The need for additional supply in the Markham-Richmond Hill area was discussed with the LAC by providing details on the forecasted electricity needs, the methodology behind the forecast and the available supply capacity.

Solution Options – Non Wire Alternatives

Both distributed energy resources (e.g., targeted demand response, small-scale renewables, advanced storage technologies, micro-grid and smart-grid technologies) as well as distribution and transmission reinforcements were considered as a means of increasing capacity in the Markham-Richmond Hill area.

To defer the near-term supply need in the Markham-Richmond Hill area, a substantial amount of distributed energy resources (about 100 MW) would need to be implemented within the next five years. In 2016, Alectra Utilities and the IESO conducted a study to examine the feasibility of implementing residential solar-storage technology in Markham, Richmond Hill and Vaughan. Given the timing and magnitude of electricity demand growth in the Markham-Richmond Hill area, the study confirmed that it is not feasible to solely rely on residential solar-storage technology to defer the near-term supply need in this area. However, there may be an opportunity for residential solar-storage technology or other non-wires solutions to play a role in deferring electricity supply needs in Northern York Region-Vaughan over the longer term. The IESO, in partnership with local utilities, are undertaking a number of initiatives and pilots to better understand the cost and technical feasibility of implementing distributed energy resources solutions in a local area. The results and lessons learned from these initiatives and continual engagement with communities and LAC members will help the Working Group understand the extent to which distributed energy resources could play a role in deferring longer-term needs in York Region.

Given the conclusion that it is not feasible to rely entirely on distributed energy resources to defer the near-term supply need in this area, a new transformer station and associated distribution and transmission connection lines will be required to meet the growth projections for the Markham-Richmond Hill area. Depending on the location of the new transformer station, different levels of transmission and distribution build-out will be required.

In 2016, the IESO, along with the local utilities, engaged and have reached out to municipalities and Indigenous communities in York Region to confirm the projected growth, inform them of the near-term need for a new transformer station and associated distribution and/or transmission line in the

Markham-Richmond Hill area and to discuss at a high-level the medium- and longer-term planning activities in York Region.

Recommended Scope

To address the near-term electricity needs in the Markham-Richmond Hill area, the IESO, on behalf of the Working Group, recommends proceeding with the project consisting of:

- a new 230/27.6kV DESN transformer station in the northwestern part of Markham; and
- distribution and/or transmission lines to connect the new transformer station.

The Working Group recommends that Alectra Utilities and Hydro One Transmission proceed with the work leading to the implementation of this project including pursuing the required environmental and regulatory approvals. The details related to the siting (i.e., the location of the new transformer station) and routing of these facilities will be addressed as part of the project development process and there will be opportunities for public input. Due to the timing of the needs, and considering typical development timelines for system reinforcement projects, Alectra Utilities and Hydro One Transmission should work toward a targeted in-service date of 2023.

The IESO looks forward to the opportunity to continue supporting Alectra Utilities and Hydro One Transmission throughout the implementation of this project.

Kind regards,

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