April 30, 2024

BY EMAIL: [redacted]

Lesley Gallinger
CEO, Independent Electricity System Operator (IESO)

Anthony Haines
CEO, Toronto Hydro

David Lebeter
CEO, Hydro One

Dear Ms. Gallinger, Mr. Haines and Mr. Lebeter:

Re: Toronto's Integrated Regional Resource Plan & Achieving Net Zero by 2040

I am writing to provide you with the Ontario Clean Air Alliance's submissions with respect to your public engagement plan to support the development of your Integrated Regional Resource Plan (IRRP) to meet Toronto's electricity needs to 2042.

According to your Engagement Plan, you wish to ensure that your IRPP:

- Aligns with community perspectives on local needs;
- Incorporates options to meet the growing electricity demand in the Toronto Region taking into account local energy priorities; and
- Ensures a reliable source of electricity in the region over the next twenty years.[i]

As you know, the City of Toronto has adopted the goal of net zero greenhouse gas emissions by 2040.

According to the City's *Annual TransformTO Net Zero Progress and Accountability Report* (March 2024)*:*

- Increased local renewable energy is critical to ensuring a resilient, carbon-free electricity grid.
- The City and Toronto Hydro are working to ensure that Toronto has enough clean, renewable and reliable electricity to power its net zero future.
- However, local action threatens to be overwhelmed by the impact of a provincial electricity grid that includes increasing reliance on polluting fossil gas.
- Key technologies for a net zero future like heat pumps, EVs, solar and wind energy and battery storage have all become competitive versus fossil fuel alternatives in a relatively short time. A net zero future has never been more attainable.[ii]

Clearly, to respect the priorities of the City of Toronto we need an IRPP that will phase-out the Portlands gas plant and provide Toronto with reliable, zero-carbon and renewable electricity. We also need a plan that recognizes fast moving changes in how we can meet our electricity needs thanks to rapidly evolving new technologies and systems. But to develop an IRPP that will meet the City's needs for zero-carbon electricity at the lowest reasonable cost, and to allow informed public engagement, we need information about Toronto's existing and forecast electricity demands and its options for meeting its future electricity needs. This should include, demand management, energy efficiency and local electricity supply and storage.

Therefore, we are writing to request the IRPP's Technical Working Group, consisting of the IESO, Toronto Hydro and Hydro One, to provide Toronto City Council and citizens with the following information.

<u>Toronto's Existing Electricity Demand</u>

1. Please provide Toronto's total demand for electricity (MWh) in 2023. Please break out this demand by the following customer groups: a) residential; b) general service; and c) large users. For each customer group please provide their electricity consumption for: a) lighting, b) space heating; c) water heating; d) cooling; and e) electric vehicles.

2. Please provide Toronto's total summer and winter peak demands (MW) in 2023. Please break out the summer and winter peak demands by the following customer groups: a) residential; b) general service; and c) large users. For each customer group please provide their summer and winter peak electricity demands for: a) lighting, b) space heating; c) water heating; d) cooling; and e) electric vehicles.

<u>The Technical Working Group's (TWG's) Forecast of Toronto's Future Electricity Demands</u>

1. Please provide the TWG's forecast of Toronto's total demand for electricity (MWh) in 2025; 2030, 2035, 2040 and 2042 pursuant to its "Reference" and "High Electrification" scenarios. Please break out these demand forecasts by the following customer groups: a) residential; b) general service; and c) large users. For each customer group please provide the forecast electricity consumption for: a) lighting, b) space heating; c) water heating; d) cooling; and e) electric vehicles.

2. Please provide the TWG's forecast of Toronto's total summer and winter peak demands (MW) in 2025, 2030, 2035, 2040 and 2042 pursuant to its "Reference" and "High Electrification" scenarios. Please break out these demand forecasts by the following customer groups: a) residential; b) general service; and c) large users. For each customer group please provide the forecast electricity demand for: a) lighting, b) space heating; c) water heating; d) cooling; and e) electric vehicles.

Demand Management

Paying customers to shift some of their demands from peak to off-peak periods is a very cost-effective way to reduce the need for new high-cost peaking electricity generation, transmission and distribution infrastructure.

For example, the IESO is paying industrial, commercial and institutional customers $65,000 per MW to shift some of their electricity demands from peak to off-peak periods,[iii] whereas in the summer of 2023 it agreed to pay Capital Power & Eastern Power $273,000 per MW per year to build new gas-fired peaker plants.[iv] This means the cost of these peak reductions is 76% lower than the cost of new gas-fired generation.

In addition, last year the IESO established the Peak Perks program to turn down the thermostats of residential air-conditioners and heat pumps by up to two degrees Celsius on hot summer days. The program has already enrolled more than 100,000 participants who together can deliver up to 90 MW of peak demand reductions at a cost of approximately $22,000 to $83,000 per MW.[v] This means Peak Perks is keeping our lights on at a cost that is 70 - 92% lower than the cost of a new gas-fired peaker plant.

1. Please provide the TWG's forecast of the demand reductions (MW) that could be obtained from Toronto's industrial, commercial and institutional customers In 2025, 2030, 2035, 2040 and 2042 if they were paid $273,000 per MW to reduce their peak hour demands.

2. Please provide the TWG's forecast of the demand reduction (MW) that could be obtained from Toronto's residential customers in 2025, 2030, 2035, 2040 and 2042 if all of their central air conditioners and heat pumps were enrolled in the Peak Perks program.

3. Please provide the TWG's forecast of the incremental demand reductions (MW) that could be obtained from Toronto's residential customers in 2025, 2030, 2035, 2040 and 2042 if the Peak Perks program is expanded to also control all of their electric water heaters.

Energy Efficiency

Energy efficiency investments can meet our electricity needs at a much lower cost than new electricity supply. For example, in 2022 the IESO paid on average only 1.6 cents to save a kWh, whereas according to Lazard, the cost of a new nuclear reactor could be 24 cents per kWh.[vi]

This means the cost of saving a kWh is up to 93% lower than the cost of a new nuclear reactor.

1. Please provide the TWG's forecast of the electricity savings (MWh) that could be achieved in Toronto by 2025, 2030, 2035, 2040 and 2042 if the IESO and/or Toronto Hydro were willing to pay for all electricity savings that could be achieved at a cost that is less than or equal to the cost of electricity from a new nuclear reactor (e.g., 24 cents per kWh).

Great Lakes Wind Power

In 2023 Toronto's total electricity consumption was 23.7 TWh[vii] and the total output of the Portlands gas-fired power plant on the Toronto waterfront was 2.1 TWh[viii].

Thirty-two 15 MW wind turbines in Lake Ontario could produce as much electricity as the Portlands gas plant did in 2023.[ix]

According to the IESO, the output of Ontario's gas plants in 2030 will be about 2.4 times their 2023 level.[x] That is, under a business-as-usual scenario, the output of the Portlands gas plant in 2030 will be approximately 5 TWh (2.1 TWh x 2.4).

1. Please provide the TWG's forecast of the cost per kWh of supplying Toronto with 5 TWh per year of Lake Ontario offshore wind power by 2035.

Solar Power

1. Please provide the TWG's forecast of the cost per kWh of supplying Toronto with 2.5 TWh of electricity per year by 2030 by installing solar PV panels on Toronto's residential rooftops.

2. Please provide the TWG's forecast of the cost per kWh of supplying Toronto with 2.5 TWh of electricity per year by 2030 by installing solar PV panels on Toronto's commercial, institutional and industrial rooftops and on municipal and commercial parking lots.

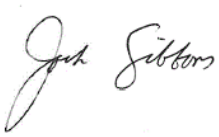
EV Batteries

Electric vehicle (EV) batteries combined with bi-directional chargers can store surplus wind and solar energy and provide power back to the grid when it is needed or to a home or building during a power outage.

By 2030 the total storage capacity of Ontario's EVs' batteries will be more than double the capacity of Ontario's gas plants.[xi]

1. Please provide the TWG's forecast of the total storage capacity (MW and MWh) of Toronto's EVs' batteries (including fleet vehicles) in 2025, 2030, 2035, 2040 and 2042.

Yours sincerely,



Jack Gibbons
Chair

[i] https://www.ieso.ca/Sector-Participants/Engagement-Initiatives/Engagements/Regional-Electricity-Planning-Toronto

[ii] https://www.toronto.ca/wp-content/uploads/2024/03/95d3-Attachment-1-Annual-TransformTO-Net-Zero-Progress-and-Accountability-Report.pdf. See pages 6, 8, 9 and 19.

[iii] The summer and winter capacity auction clearing prices were $367.41 and $146.96 per MW-day respectively. There are 127 and 125 business days in the summer and winter periods respectively. Therefore, the annual cost of a MW reduction is $65,000 per MW. IESO, *Capacity Auction: Post Auction Report*, (December 7, 2023).

[iv] The weighted average fixed capacity payment for the Capital Power and Eastern Power gas plants is $1,093.22 per MW per business day. We calculated the annual cost by multiplying the daily cost by 250 business days. IESO, *Expedited Long-Term RFP – Final Results*, (September 18, 2023).

[v] Participants are paid $75 when they enroll and receive $20 per year for each additional year that they stay enrolled. IESO, News Release, "Save on Energy's Peak Perks Program Reaches Milestone Enrollment", (February 1, 2024).

[vi] Ontario Clean Air Alliance Research Inc., *Ontario's Electricity Options: A Cost Comparison*, (April 19, 2024).

[vii] Toronto Hydro Corporation, *Annual Information Form For The Year Ended December 31, 2023*, page 17.

[viii] Email to Jack Gibbons from Stephen Smith, Environmental Specialist, Atura Power (April 19, 2024).
[ix] According to the IESO, Great Lakes offshore wind turbines would have a 50% annual capacity utilization rate. Therefore a 15 MW offshore wind turbine will produce 65,700 MWh per year (15 MW x 8760 hours x 0.5). IESO, *Pathways to Decarbonization: Appendix B,* (December 15, 2022), page 29.
[x] IESO, *2023 Year in Review*; and IESO, *2024 Annual Planning Outlook*, Data Tables, Figures 26 & 27.
[xi] https://www.cleanairalliance.org/wp-content/uploads/2022/01/Vehicle-to-Building-and-Grid-for-Peak-Needs-November-22-2021-1.pdf