



**For Action  
with Confidential Attachment**

## **Principal Agreement with PowerON Energy Solutions LP (OPG) to Decarbonize TTC Operations, Fleet, and Facilities**

**Date:** February 10, 2022

**To:** TTC Board

**From:** Executive Director, Innovation and Sustainability

### **Reason for Confidential Information**

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This report contains information about a position, plan, procedure, criterion or instruction to be applied to negotiations carried on or to be carried on by or on behalf of the TTC.

### **Summary**

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The TransformTO Strategy identifies the growth and greening of public transit as a critical enabler for the City of Toronto to achieve Net Zero by 2040. Through the newly established Innovation and Sustainability Program (ISP), the TTC will apply a climate lens to its strategic decision making processes, reduce the organization's greenhouse gas emissions, and make its operations more resilient to the effects of climate change.

There are a number of transformational strategies which the TTC must employ to do its part. This broad view of TTC's strategy and plan to advance innovation and environmental sustainability, including climate change mitigation and resiliency, is taking shape through consultations and will be the subject of an ISP report to be presented at the TTC June 2022 Board's meeting. While the overall ISP is still being formulated, one such strategy under ISP will be to decarbonize transit operations, fleets, and facilities through the deployment of electrification infrastructure.

With approval of the Board, on May 6, 2021 TTC entered into a memorandum of understanding (MOU) with Ontario Power Generation Inc. (OPG) and Toronto Hydro-Electric System Limited (Toronto Hydro) for the provision of electrification infrastructure (Attachment 1). Under the MOU, Toronto Hydro is responsible for upgrading the electrical supply to TTC properties and OPG will co-invest in, design, build, own, operate, and maintain the electrification infrastructure on TTC property. Through this innovative business delivery model, the hydro utilities will deliver TTC's electrification program. TTC's responsibility is to help coordinate between internal and external stakeholders, provide direct project and engineering oversight, and arrange independent audit assurance.

Under the MOU, the TTC, Toronto Hydro, and OPG, through its subsidiary PowerON Energy Solutions LP (PowerON), have been progressing the planning and engineering of works required to implement TTC's Green Bus Program. The work to be undertaken by Toronto Hydro follows its regulated processes, however, the work required by

PowerON will follow a performance based contract for capital asset delivery and for the operations and maintenance of electrification infrastructure on TTC property.

The confidential attachment of this report includes a proposed negotiating position for a contractual agreement with PowerON for the provision of services required to decarbonize TTC's operations, fleet, and facilities.

## **Recommendations**

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It is recommended that the TTC Board:

1. Approve the proposed negotiated terms with PowerON Energy Solutions LP (a subsidiary of Ontario Power Generation Inc.) for the co-investment, ownership, design, build, operation, and maintenance of electrification infrastructure as set out in the confidential attachment.
2. Delegate authority to the CEO to enter into the TTC-PowerON Principal Agreement with PowerON Energy Solutions LP (a subsidiary of Ontario Power Generation Inc.),
  - i) with an upset limit amount of \$69.8 million in Canadian funds, inclusive of all taxes, for implementation of fleet electrification infrastructure;
  - ii) subject to the receipt of further funding commitments by TTC towards remaining fleet electrification infrastructure, to amend the TTC-PowerON Principal Agreement upset limit up to \$591 million in Canadian funds, inclusive of all taxes; and
  - iii) subject to terms and conditions satisfactory to the TTC's General Counsel.
3. Request regular reporting back to the Board on the performance of PowerON Energy Solutions LP through staff's updates on the TTC's Green Bus Program.
4. Subject to the mutual agreement of TTC and PowerON Energy Solutions LP (a subsidiary of Ontario Power Generation Inc.), TTC to make public the executed TTC-PowerON Principal Agreement.

## **Financial Summary**

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### Capital Budget Impact

The 2022 to 2031 Capital Budget and Plan includes the necessary funding to meet TTC's contractual requirements of the TTC-PowerON Principal Agreement with PowerON Energy Solutions LP.

The total approved project cost for the eBus Charging Systems Project is \$117.9 million comprising costs to the end of 2020 of \$39.1 million, projected year-end spending of \$1.2 million for 2021, and funding of \$77.6 million cash flowed between 2022 and 2025, which reflects a projected incremental carryforward adjustment of \$8.7 million subject to City Council approval. This funding is provided under Program 3.2 Equipment – eBus

Charging Systems Project, as approved by the Board on December 20, 2021 and will be reviewed by City Council on February 17, 2022. Of this funded amount, payments to PowerON are estimated at \$69.8 million and are scheduled as follows in Table 1 below:

**Table 1**

<b>Contract Year</b>	<b>PowerON Payment Schedule</b>
2022	\$36,620
2023	\$22,081
2024	\$7,794
2025	\$3,329
<b>Funded 10-Year Sub Total</b>	<b>\$69.824</b>

The contract work will be administered on a Work Assignment Release (WAR) basis. As each task is identified, a work plan will be prepared with an estimate to be approved by TTC staff.

Execution of the TTC-PowerON Principal Agreement provides a contractual mechanism through which all TTC’s eBus charging systems infrastructure program and future fleet and facility electrification infrastructure programs can be delivered at a cost of \$591 million. The TTC is currently pursuing partnership funding with intergovernmental partners, including through the federal Zero-Emissions Transit Fund. As net new funding is secured, TTC can, subject to the approval of Recommendation #1(ii) of this report, amend the contract with PowerON up to \$591 million to allow for expedited execution of the infrastructure work required to decarbonize TTC’s fleet.

The total 15-year CIP estimated cost for the implementation of the all electric vehicle charging systems, including eBuses, Wheel-Trans buses (WT), Operating Support Vehicles (OSV), as well as for employee and customer parking lots, is currently estimated at approximately \$878.1 million, as outlined in Table 2 below.

Of the \$656.8 million funding required during 2022-2031, \$77.6 million is funded and \$579.2 million remains unfunded. A further \$221.3 million in unfunded requirements has been included in the past years, 2032-2036.

The \$77.6 million in funding included in the 2022-2031 Capital Budget and Plan is specifically allocated for the eBus charging infrastructure and covers the projected payments to PowerON of \$69.824 million. Combined with the City’s funding of \$607 million towards eBus vehicle procurements, the City has committed approximately a 1/3 share of the overall cost of the TTC’s Green Bus Program.

The \$579.2 million that is unfunded from 2022 to 2031 is for all of the remaining infrastructure required for eBus, Wheel-Trans bus, and Operating Service Vehicle charging systems, as well as employee parking and customer parking charging systems.

**Table 2**  
**2022-2031 Capital Budget and Plan and 10-Year Capital Investment Plan**  
**for Vehicle Electrification Infrastructure and Estimated Payments to PowerON ('000s)**

Program	2022-2031 Capital Plan	Project Name	2022 Budget*	2023	2024	2025	2026	2027-2031	10-Year Total	Post 2031	15-Year CIP	Total Project Costs
3.2	2022-2031 Capital Plan	eBus Charging Systems – Purchase	40,689	24,534	8,660	3,699	-	-	77,582	-	77,582	117,922
3.2	Capital Investment Plan	eBus Charging Systems – Purchase	-	2,355	90,956	84,516	39,904	249,790	467,521	180,781	648,302	648,302
3.2	Total CIP	eBus Charging Systems – Purchase	40,689	26,889	99,617	88,215	39,904	249,790	545,104	180,781	725,884	766,224
3.2	2022-2031 Capital Plan	Electric WT Charge Sys-Purchase	-	-	-	-	-	-	-	-	-	-
3.2	Capital Investment Plan	Electric WT Charge Sys-Purchase	864	6,509	280	1,428	1,568	32,128	42,777	-	42,777	42,777
3.2	Total CIP	Electric WT Charge Sys-Purchase	864	6,509	280	1,428	1,568	32,128	42,777	-	42,777	42,777
3.2	2022-2031 Capital Plan	Electric OSV Charge Sys-Purchase	-	-	-	-	-	-	-	-	-	-
3.2	Capital Investment Plan	Electric OSV Charge Sys-Purchase	713	3,620	1,360	4,886	2,630	18,880	32,090	40,502	72,591	72,591
3.2	Total CIP	Electric OSV Charge Sys-Purchase	713	3,620	1,360	4,886	2,630	18,880	32,090	40,502	72,591	72,591
3.2	2022-2031 Capital Plan	EMPL Parking Charge Sys-Purchase	-	-	-	-	-	-	-	-	-	-
3.2	Capital Investment Plan	EMPL Parking Charge Sys-Purchase	1,143	2,396	4,715	2,494	194	196	11,137	-	11,137	11,137
3.2	Total CIP	EMPL Parking Charge Sys-Purchase	1,143	2,396	4,715	2,494	194	196	11,137	-	11,137	11,137
3.2	2022-2031 Capital Plan	CUST Parking Charge Sys-Purchase	-	-	-	-	-	-	-	-	-	-
3.2	Capital Investment Plan	CUST Parking Charge Sys-Purchase	1,161	11,540	11,771	595	602	-	25,670	-	25,670	25,670
3.2	Total CIP	CUST Parking Charge Sys-Purchase	1,161	11,540	11,771	595	602	-	25,670	-	25,670	25,670
3.2	2022-2031 Capital Plan	TOTAL Green Fleet Infrastructure Program	40,689	24,534	8,660	3,699	-	-	77,582	-	77,582	117,922
3.2	Capital Investment Plan	TOTAL Green Fleet Infrastructure Program	3,882	26,420	109,083	93,919	44,898	300,994	579,195	221,282	800,477	800,477
3.2	Total CIP	TOTAL Green Fleet Infrastructure Program	44,571	50,954	117,743	97,618	44,898	300,994	656,777	221,282	878,059	918,399

\*Includes a projected incremental carryforward adjustment of \$8.7 million subject to City Council approval

It should be noted that this partnership with OPG is both innovative in its approach while still ensuring that the procurement process is competitive and achieves value for money. It is in the parties' mutual interest is to adopt the best of new technologies and ensure value-for-money for the stewardship of public funds. While the relationship between TTC and its hydro utilities is of a single source nature, approximately 90% of capital payments to PowerON will flow through to major suppliers. As such, all major contracts entered into by PowerON will be sourced through OPG's competitive public procurement process.

### Operating Budget Impact

Delivery of TTC's next procurement of approximately 300 eBuses is expected to begin in Q3 of 2023. Payments to PowerON for the operations and maintenance (O&M) of eBus electrification infrastructure are not expected to start until 2024, approximately 6 months after the first eBuses arrive.

The O&M cost for eBus electrification infrastructure in 2024 is estimated at \$3.4 million. These costs will scale up as the eBus fleet increases and as bus garages are retrofitted with electrification infrastructure over the following 16 years to support an all-electric fleet in 2040. Starting in 2040, and each year through to the end of the 20-year term of the TTC-PowerON Principal Agreement, O&M costs are estimated at approximately \$30 million per year (includes escalation).

The annual estimated cost of electricity required to power a fleet of approximately 2470 buses in 2040 is \$55 million (payments Toronto Hydro for the supply of electricity).

The sum of annual O&M and electricity costs, estimated at \$85 million per year, is less than the cost of diesel fuel which will result in a net overall operating budget savings.

Staff will present a full economic analysis to the Board, including an annual projection of greenhouse gas emissions, fuel costs, electricity costs, vehicle maintenance costs, as well as an estimate of broader societal benefits through its report on the TTC's Green Bus Program planned for Q2 2022. Further, this report will include proposed financial planning strategies on how best to leverage the benefits including, but not limited to, the use of operating budget savings to secure net new capital funding.

The Chief Financial Officer has reviewed this report and agrees with the financial summary information.

## **Equity/Accessibility Matters**

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A cornerstone of the TTC's Corporate Plan 2018-2022 is accessibility, and as a proud leader in providing accessible public transit in the city of Toronto, we are committed to ensuring reliable, safe and inclusive transit services for all our customers.

As detailed in staff's April 2021 report to the Board on the TTC's eBus Head-to-Head Evaluation, all upcoming vehicle procurements and overhaul programs will have both procurement equity and green procurement requirements. While the TTC-PowerON Principle Agreement has yet to be executed, PowerON has accepted the proposed terms in principle and will be enforcing both procurement equity and green procurement requirements in all major contracts through a public procurement process.

In addition, all transit buses, regardless of propulsion technology, are required to be compliant with the Canadian Standards Association (CSA) D437 standard for accessible transit buses and the Integrated Accessibility Standards – Part IV (Transportation Standards) under the Accessibility for Ontarians with Disabilities Act. Further, the TTC strives to exceed minimum requirements and actively engages the Advisory Committee on Accessible Transit (ACAT) in the design and evaluation of all transit vehicle procurements.

Through staff's oversight of the electrification infrastructure program, and the green fleet programs more broadly, TTC will continue to work with ACAT and seek opportunities to advance our efforts toward a barrier free transit system when adopting these new technologies. These will continue to be supported through the principal agreement with PowerON Energy Solutions LP (OPG) as we work together to decarbonize TTC operations, fleet, and facilities.

## **Decision History**

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At the June 12, 2018 TTC Board meeting, TTC staff presented a report of the update on the Green Bus Technology Plan, which was originally approved by the Board at its November 2017 meeting. The Board delegated the authority to the CEO to procure an additional 30 long-range, eBuses, for a total of 60, and directed the TTC to work with Toronto Hydro to begin preparations for the electrification of the TTC's first all electric bus garage to support future procurements of eBuses for a total cost of \$90 million.

Report:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2018/June-12/27\\_Green\\_Bus\\_Technology\\_Plan\\_Update.pdf?rev=a1c91d7b3eba4fbd8930bf89b00d2955&hash=30D094118976BA165E6412CA7F665D87](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2018/June-12/27_Green_Bus_Technology_Plan_Update.pdf?rev=a1c91d7b3eba4fbd8930bf89b00d2955&hash=30D094118976BA165E6412CA7F665D87)

Decision:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2018/June-12/27\\_D\\_Green\\_Bus\\_Technology\\_Plan\\_Update\\_Decision.pdf?rev=ca8415ac262644a8b0a9cbc49c59499&hash=DE9DD1F6581F23ED34833AA1AE970087](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2018/June-12/27_D_Green_Bus_Technology_Plan_Update_Decision.pdf?rev=ca8415ac262644a8b0a9cbc49c59499&hash=DE9DD1F6581F23ED34833AA1AE970087)

At its October 22, 2020 meeting, the TTC Board received the TTC's Fleet Procurement Strategy and Plan. The Board directed the TTC continue to work with Toronto Hydro and OPG, and report back to the Board with draft agreement(s) for the delivery of the required bus, Wheel-Trans and non-revenue vehicle charging infrastructure to enable achievement of TTC's target for a fossil-fuel-free/zero-emissions fleet by 2040.

Report:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2020/October\\_22/Reports/5\\_TTC\\_Fleet\\_Procurement\\_Strategy\\_and\\_Plan.pdf?rev=ed6e2828628c484daf919cc64b83b111&hash=32DE90249784BB0438C9B4E266C1D718](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2020/October_22/Reports/5_TTC_Fleet_Procurement_Strategy_and_Plan.pdf?rev=ed6e2828628c484daf919cc64b83b111&hash=32DE90249784BB0438C9B4E266C1D718)

Presentation:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2020/October\\_22/Reports/5\\_Staff\\_Presentation\\_TTC\\_Fleet\\_Procurement\\_Strategy\\_and\\_Plan.pdf?rev=75b9872828074ed3a28d42b13df2bc2a&hash=2F7C490A3796CA429A996777BD97452D](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2020/October_22/Reports/5_Staff_Presentation_TTC_Fleet_Procurement_Strategy_and_Plan.pdf?rev=75b9872828074ed3a28d42b13df2bc2a&hash=2F7C490A3796CA429A996777BD97452D)

Decision:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2020/October\\_22/Reports/Decisions/2047\\_5\\_TTC\\_Fleet\\_Procurement\\_Strategy\\_and\\_Plan\\_Decision.pdf?rev=9d10a7d0ba0b49839a2915072b9b0fd8&hash=0535C87A4FF1C266805F715C6765D13D](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2020/October_22/Reports/Decisions/2047_5_TTC_Fleet_Procurement_Strategy_and_Plan_Decision.pdf?rev=9d10a7d0ba0b49839a2915072b9b0fd8&hash=0535C87A4FF1C266805F715C6765D13D)

At the April 2021 TTC Board meeting, TTC staff presented the Framework for Agreement between TTC, Toronto Hydro and OPG, where Toronto Hydro is responsible for upgrading the electrical feeders supply to TTC properties and OPG co-invests, designs, builds, owns, operates and maintains the electrification infrastructure on TTC properties.

Report:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/April\\_14/7\\_TTCs\\_Green\\_Bus\\_Program\\_TTC\\_OPG\\_THESL\\_Framework\\_for\\_Agreement\\_on\\_Electrification\\_Infrastructure.pdf?rev=529587fba9a844908c1f8774f39487e6&hash=65F216FEE8FB56D55F238EBEBED3D40D](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/April_14/7_TTCs_Green_Bus_Program_TTC_OPG_THESL_Framework_for_Agreement_on_Electrification_Infrastructure.pdf?rev=529587fba9a844908c1f8774f39487e6&hash=65F216FEE8FB56D55F238EBEBED3D40D)

Presentation:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/April\\_14/7\\_Staff\\_Presentation\\_TTC\\_Green\\_Bus\\_Program\\_TTC\\_OPG\\_THESL\\_Framework\\_for\\_Agreement.pdf?rev=907b8a05a9104675a939df3a0b9fd506&hash=9C5F40BB5D4CDBDB682784AF64C32285](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/April_14/7_Staff_Presentation_TTC_Green_Bus_Program_TTC_OPG_THESL_Framework_for_Agreement.pdf?rev=907b8a05a9104675a939df3a0b9fd506&hash=9C5F40BB5D4CDBDB682784AF64C32285)

Decision:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/April\\_14/20527TTCsGreenBusProgramTTCOPGTHESLFrameworkforAgreementonElectrificationInfrastructureDecision.pdf?rev=cecfe1fae95f488aa9745858c14bede5&hash=39A45E70AE53F1CDFDD4923E26F406CD](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/April_14/20527TTCsGreenBusProgramTTCOPGTHESLFrameworkforAgreementonElectrificationInfrastructureDecision.pdf?rev=cecfe1fae95f488aa9745858c14bede5&hash=39A45E70AE53F1CDFDD4923E26F406CD)

At its July 7, 2021 meeting, the TTC Board requested the CEO report back by Q4 2021 on the creation of an organization-wide Innovation and Sustainability program at the TTC, with a mandate to advance planning, delivery, integration and reporting of innovation initiatives, while incorporating a climate and resiliency lens.

Decision:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/July\\_7/Decisions/2056\\_8\\_Contract\\_Award\\_for\\_SAP\\_Time\\_and\\_Attendance\\_Project\\_De.pdf?rev=4898044be3c94acf9f45de725ba88cfd&hash=A4090F227143EACA65F7E6CB311C195E](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/July_7/Decisions/2056_8_Contract_Award_for_SAP_Time_and_Attendance_Project_De.pdf?rev=4898044be3c94acf9f45de725ba88cfd&hash=A4090F227143EACA65F7E6CB311C195E)

On December 7, 2021, the CEO Board Report announced the establishment of the TTC Innovation and Sustainability Program to help deliver on TTC's commitments under the TTC's Corporate Plan and the City's TransformTO Climate Action Plan.

Report:

[https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/December-8/1\\_Chief\\_ExecutiveOfficers\\_Report\\_November\\_December\\_2021.pdf?rev=3e44bdaf7a76465ebf8d34d62f50393f&hash=D4A9EAD94AFFA9CE304C62829CF4FA21](https://ttc-cdn.azureedge.net/-/media/Project/TTC/DevProto/Documents/Home/Public-Meetings/Board/2021/December-8/1_Chief_ExecutiveOfficers_Report_November_December_2021.pdf?rev=3e44bdaf7a76465ebf8d34d62f50393f&hash=D4A9EAD94AFFA9CE304C62829CF4FA21)

On December 15, 2021, City Council adopted the TransformTO Net Zero Strategy, which outlined a pathway to achieve net zero emission in Toronto by 2040. The Net Zero Strategy presented critical steps to achieve that target including, but not limited to: TTC's transition to a zero-emissions fleet and the need to phase out fossil fuel use for the heating of buildings by 2040.

<https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/>

## **Issue Background**

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At its June 2018 meeting, the TTC Board directed the TTC to work with Toronto Hydro on the design and implementation of charging systems infrastructure for TTC's first 60 eBuses.

At its February 2020 meeting, recognizing the overall success of the first phase of electrification, the TTC Board directed TTC to explore partnership opportunities to obtain best chances of continued success through a co-investment, design, build, ownership, operation and maintenance model.

At its October 22, 2020 meeting, the TTC Board received the TTC's Fleet Procurement Strategy and Plan which included a recommendation to continue working with Toronto Hydro and OPG on agreements to enable full-fleet electrification. The Board directed TTC to continue working with Toronto Hydro and OPG and report back to the Board in Q1 2021 with draft agreement(s) for the delivery of the required bus, Wheel-Trans and non-revenue vehicle charging infrastructure to enable achievement of the TTC's target for a fossil-fuel-free/zero-emissions fleet by 2040.

At the April 14, 2021 Board Meeting, TTC staff presented a capital delivery options analysis for electrification infrastructure. Based on this analysis, staff recommended a Framework for Agreement between TTC, Toronto Hydro and OPG, under which Toronto Hydro is responsible for upgrading the electrical feeders supply to TTC properties and OPG co-invests, designs, builds, owns, operates and maintains the electrification infrastructure on TTC properties. The TTC Board approved the Framework for Agreement and delegated authority to the CEO to enter into a non-bidding MOU between the three parties. As definitive agreements with Toronto Hydro are already defined by Ontario Energy Board regulations, the Board approved continuing negotiations with OPG and requested staff report back to the Board with proposed negotiating position and commercial terms.

On May 6, 2021, TTC entered into the MOU with Toronto Hydro and OPG.

Subsequently, OPG formally established PowerON Energy Solutions LP, an OPG subsidiary focused on the provision of transit electrification infrastructure.

## **Comments**

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Consistent with the TTC Board approved Framework for Agreement and the MOU between TTC, OPG, and Toronto Hydro, the scope of services under the proposed TTC-PowerON Principal Agreement includes the following two phases of work:

- 1) Capital Asset Delivery: PowerON is to co-invest, own, design, build, test, and commission electrification infrastructure including, but not limited to, substations, switch gear, distributed energy resources (e.g., solar arrays, battery storage systems, and emergency backup generation), electric vehicle chargers, energy management system(s), and associated electrical and civil works.
- 2) Operations and Maintenance: PowerON is to operate and maintain electrification infrastructure at TTC sites to, (i) enable TTC to deliver reliable zero-emissions transit services; and (ii) utilize the assets to provide hydro grid resiliency and optimize revenue.



While the work to be undertaken by Toronto Hydro follows its regulated processes, the services provided by PowerON follow a performance based contract for capital asset delivery, and operations and maintenance of electrification infrastructure.

Once executed, the TTC-PowerON Principal Agreement will contain all applicable obligations, responsibilities, ownership rights, performance requirements, and equipment warranties to ensure charging systems are implemented.

The confidential attachment of this report includes a proposed negotiating position for TTC in respect of the TTC-PowerON Principal Agreement for the provision by PowerON of services required to decarbonize TTC's operations, fleet, and facilities.

With execution of the TTC-PowerON Principal Agreement, and with mutual agreement of both parties, TTC will make the Principal Agreement public in the interest of maintaining due transparency and accountability.


## **Contact**

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Bem Case, Executive Director of Innovation and Sustainability  
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## **Signature**

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Bem Case  
Executive Director of Innovation and Sustainability

## **Attachments**

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Attachment 1: TTC-OPG-THESL Memorandum of Understanding

Confidential Attachment: Proposed Terms for TTC-PowerON Principal Agreement

**Attachment 1**  
**TTC-OPG-THESEL Memorandum of Understanding**

# MEMORANDUM OF UNDERSTANDING

## REGARDING IMPLEMENTATION OF THE TORONTO TRANSIT COMMISSION'S GREEN FLEET PROGRAM

Entered into on this 6<sup>th</sup> day of May, 2021.

### BETWEEN:

**TORONTO TRANSIT COMMISSION** a body corporate pursuant to the *City of Toronto Act, 2006*, S.O. 2006, c. 11, Schedule A, as amended, engaged in the carriage of passengers for hire in and about the City of Toronto in the Province of Ontario ("**TTC**")

### AND

**ONTARIO POWER GENERATION INC.** a corporation existing under the laws of Ontario engaged in the generation of power in the Province of Ontario ("**OPG**")

### AND

**TORONTO HYDRO-ELECTRIC SYSTEM LIMITED** a subsidiary of Toronto Hydro Corporation engaged in the business of distributing electricity in the City of Toronto in the Province of Ontario ("**THESL**")

### WHEREAS:

- A. TTC, OPG, and THESL wish to formally express their intention to support TTC's efforts in reducing greenhouse gas emissions and improving local air quality through the electrification of TTC's bus, Wheel-Trans bus, and non-revenue vehicle fleet ("**TTC's Green Fleet Program**").
- B. TTC, OPG and THESL's corporate commitments are aligned as follows:
  - i. TTC is committed to a one hundred percent (100%) zero-emissions fleet by 2040 as part of its efforts under the 2018-2022 TTC Corporate Plan to modernize its service, innovate for the long term, and mitigate climate change.
  - ii. OPG is committed to being a net-zero carbon company by 2040 and to being a catalyst to help the markets where it operates achieve net-zero carbon economies by 2050.
  - iii. THESL is committed to delivering safe and reliable electricity to its customers in an environmentally responsible manner at optimal costs, and to meeting the financial, environmental, sustainability and operational objectives as set out in the City of Toronto's shareholder direction to Toronto Hydro Corporation as well as its regulatory obligations.

## 1. Cooperation

- (a) TTC's Green Fleet Program requires implementation of reliable electricity supply and charging infrastructure at TTC bus garages and certain TTC stations and stops (collectively, "TTC Sites").
- (b) The parties acknowledge that the successful implementation of TTC's Green Fleet Program requires significant cooperation between their organizations to upgrade electrical infrastructure, enable connections to the electrical distribution system in the City of Toronto, provide for the reliability of the electricity supply in accordance with regulatory requirements, and enable operations of charging infrastructure at TTC Sites.
- (c) TTC, OPG, and THESL agree to provide their assistance and share their expertise in an open, reasonable, and transparent way to jointly work toward an effective and efficient implementation of TTC's Green Fleet Program. Such expertise shall include the expertise of,
  - (i) TTC in the acquisition and operation of electric vehicles to serve the community;
  - (ii) OPG in the management of engineering, procurement, construction, operation, and maintenance of behind-the-meter charging infrastructure and distributed energy resources at TTC Sites; and
  - (iii) THESL in the effective and efficient delivery of electrical service to TTC Sites.
- (d) The parties agree to work together in good faith to undertake their respective roles and responsibilities, as outlined below, in the spirit of cooperation and in accordance with their legal requirements.

## 2. Roles and Responsibilities

- (a) TTC will develop and maintain the TTC's Green Fleet Program, establishing the path to successful implementation of the business transformation program and ultimately ensuring electrification of transit in the City of Toronto by 2040. TTC responsibilities include the following:
  - i. SCOPE: Define vehicle charging needs and define the minimum performance requirements for the charging infrastructure and distributed energy resource assets located on TTC sites (collectively, the "Electrification Infrastructure").
  - ii. TIMING: Define the timeline for fleet electrification in accordance with TTC's Green Fleet Program.
  - iii. FUNDING: Make best efforts to obtain government funding required for implementation of TTC's Green Fleet Program and for ongoing operations and maintenance of the Electrification Infrastructure.

- iv. COORDINATION and OVERSIGHT which will include the following:
  - A. Specify TTC's technical and operational requirements, acting as liaison for OPG and THESL in coordinating among TTC stakeholders, and provide oversight to ensure successful delivery of TTC's Green Fleet Program.
  - B. Apply to the City of Toronto, Ontario Energy Board, and/or other authorities to obtain necessary permits, licences, and permissions for construction and use of electricity generation, energy storage, and wholesale market participation or other uses as applicable.

(b) OPG will deliver, own, maintain, and operate the Electrification Infrastructure required at TTC Sites. OPG responsibilities include the following:

- i. CO-INVESTMENT: Invest in the Electrification Infrastructure at TTC Sites, such as battery energy storage systems, backup generators, and solar generation systems. Seek government grants and government financing to benefit the TTC's Green Fleet Program.
- ii. CAPITAL ASSET MANAGEMENT
  - (a) DELIVERY: Manage the engineering, procurement, and construction of the Electrification Infrastructure at each TTC Site in accordance with the timeline specified for fleet electrification under TTC's Green Fleet Program.
  - B. OPTIMIZATION AND RENEWAL: Manage the optimization of the assets including the asset renewal planning.
- iii. OPERATIONS AND MAINTENANCE: Manage all services reasonably required to operate, repair, maintain, and modify the Electrification Infrastructure at TTC Sites, including but not limited to the following:
  - A. Operate and maintain the Electrification Infrastructure at TTC Sites to enable on-time delivery of buses for revenue service.
  - B. Optimize TTC's electricity usage and cost.
  - C. Leverage electricity market revenues for demand response, operating reserve, capacity, and other ancillary services.
- iv. REGULATORY AND TECHNICAL REQUIREMENTS: Meet all applicable regulatory and technical requirements including, but not limited to, those established by the Canadian Standards Association, the Electrical Safety Authority, and THESL relating to the assessment, connection, operation and maintenance of the Electrification Infrastructure at TTC Sites.

- (c) THESL will provide a reliable electrical supply to TTC Sites in accordance with legal and regulatory requirements and will upgrade connection points to TTC Sites. THESL's responsibilities include the following:
  - i. ELECTRICAL CONNECTIONS AND SERVICE UPGRADES which will include the following:
    - A. Review and assess connection applications in a fair and reasonable manner in accordance with THESL's connection processes, technical specifications, and standards.
    - B. Enable connections to the distribution system in accordance with Offers to Connect and Connection/Operating Agreements between THESL and TTC in forms satisfactory to THESL.
    - C. Ensure that any new connections or upgrades of existing connections to THESL's distribution system do not negatively impact the safety and reliability of the THESL distribution system.

### 3. Definitive Agreements

- (a) TTC and OPG plan to enter into a principal agreement (the "**Principal Agreement**") through which OPG will co-invest in the Electrification Infrastructure at TTC Sites and further support implementation of TTC's Green Fleet Program by managing the engineering, procurement, construction, maintenance, and operations of the Electrification Infrastructure required at TTC Sites.
- (b) Upon execution by TTC and OPG of the Principal Agreement, the Principal Agreement will govern the relationship of TTC and OPG with respect to TTC's Green Fleet Program.
- (c) TTC and THESL plan to enter into agreements including, but not limited to, Offers to Connect and Connection/Operating Agreements, in accordance with the Distribution System Code and THESL's technical standard requirements and practices, through which THESL will support the required increase in electrical loads and the distributed energy resources at TTC Sites.
- (d) Upon execution by TTC and THESL of the Offers to Connect and Connection/Operating Agreements referenced in paragraph 3(c), the Offers to Connect and Connection/Operating Agreements will govern the relationship of TTC and THESL with respect to TTC's Green Fleet Program.

### 4. General Provisions

- (a) Nothing in this MOU is intended nor shall be deemed to constitute, create, or otherwise recognize any legally binding relationship, obligation, or liability of any party.
- (b) Nothing in this MOU will be deemed to constitute any party the partner, agent, or legal representative of either of the other parties for any purpose whatsoever. No

party will have the right or the authority to assume or create any obligation or responsibility on behalf of or in the name of either of the other parties or to bind either of the other parties in any manner whatsoever.

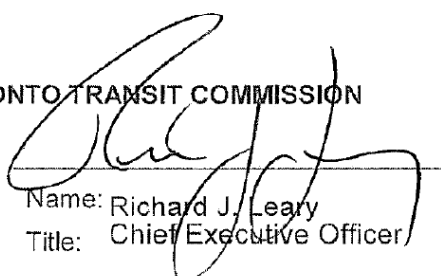
- (c) The division of this MOU into sections and the insertion of headings are for convenience of reference only and are not to affect the construction or interpretation of this MOU.
- (d) This MOU may be signed in counterparts and exchanged by electronic means.

*[SIGNATURE PAGE FOLLOWS]*

The parties hereto have duly executed this MOU as of the date written above.

**TORONTO TRANSIT COMMISSION**

Per: \_\_\_\_\_



Name: Richard J. Leary  
Title: Chief Executive Officer

**ONTARIO POWER GENERATION INC.**

Per: \_\_\_\_\_

Name:

Title:

**TORONTO HYDRO-ELECTRIC LIMITED**

Per: \_\_\_\_\_

Name:

Title:



The parties hereto have duly executed this MOU as of the date written above.

**TORONTO TRANSIT COMMISSION**

Per: \_\_\_\_\_

Name:

Title:

**ONTARIO POWER GENERATION INC.**

Per: Ken Hartwick

Name: Ken Hartwick

Title: President and CEO

**TORONTO HYDRO-ELECTRIC LIMITED**

Per: \_\_\_\_\_

Name:

Title:

The parties hereto have duly executed this MOU as of the date written above.

**TORONTO TRANSIT COMMISSION**

Per: \_\_\_\_\_  
Name:  
Title:

**ONTARIO POWER GENERATION INC.**

Per: \_\_\_\_\_  
Name:  
Title:

**TORONTO HYDRO-ELECTRIC LIMITED**

Per: *Lyberogiannis* \_\_\_\_\_  
Name: Elias Lyberogiannis  
Title: **EVP Planning & Chief Engineering and Modernization Officer**