REPORT FOR ACTION

TO Live

TO Live's Net Zero Transition Program

Date: May 28, 2024
To: Environmental, Social and Governance Committee and the Board of Directors of TO Live
From: President and Chief Executive Officer

SUMMARY

The purpose of this report is to present TO Live's Net Zero Transition Plan to the Board of Directors of TO Live.

RECOMMENDATIONS

The President and Chief Executive Officer recommends that the Board of Directors of TO Live:

1. Endorse the recommendations outlined in Attachment 1, "Net Zero Transition Program."

2. Direct the President and Chief Executive Officer to make submissions as necessary as part of the City's Carbon Budget process to ensure TO Live's Net Zero Transition Program is considered in the 2025 staff-prepared capital budget.

FINANCIAL IMPACT

There are no current-year financial impacts arising from the recommendations contained in this report, however, future-year impacts are expected as TO Live's Net Zero Transition Program is integrated into the City's capital planning process.

DECISION HISTORY

At its April 17, 2024 meeting, City Council adopted its support for a renewed focus and coordinated approach to climate resilience at the City of Toronto, including multiple collaboration strategies with City Agencies.
https://secure.toronto.ca/council/agenda-item.do?item=2024.IE12.3

At its May 10, 2023 meeting, City Council adopted the TransformTO 2022 Annual Report and a Carbon Accountability governance system that included a new Carbon Budget process and required reporting on the GHG reduction impact of City budgets and 5-year emission budgets with required planning and reporting processes.
https://secure.toronto.ca/council/agenda-item.do?item=2023.IE3.3
https://secure.toronto.ca/council/agenda-item.do?item=2023.IE3.4

At its February 15, 2023 meeting, City Council approved the 2023 Capital Budget for TO Live (agenda item #138) with cash flows and future year commitments totalling $34.155 million as detailed by project in Appendix 6a to the 2023 Staff Recommended Capital and Operating Budget Notes for TO Live.
https://secure.toronto.ca/council/agenda-item.do?item=2023.MPB4.1

At its December 5, 2022 meeting, the Board of Directors of TO Live approved TO Live's 2023 capital projects, including those with multiyear components and all related purchase orders and/or tender awards over $100,000 up to each individual project budget or adjusted budget, not to exceed the available State of Good Repair (SOGR) Council approved funding.
https://secure.toronto.ca/council/agenda-item.do?item=2023.CT1.8

At its January 27, 2022 meeting, the Board of Directors of TO Live approved TO Live's five-year (2023-2027) Strategic Plan, which included being a leader in environmental sustainability as a key objective.
https://secure.toronto.ca/council/agenda-item.do?item=2022.CT30.2

At its December 15, 2021 meeting, City Council endorsed the targets and actions in the "TransformTO - Critical Steps for Net Zero by 2040" report. City Council endorsed the TransformTO Net Zero Strategy Short-Term Implementation Plan 2022-2025.
https://secure.toronto.ca/council/agenda-item.do?item=2021.IE26.16

At its October 2, 2019 meeting, City Council declared a climate emergency, strengthened Toronto's carbon-reduction goal by establishing a net-zero greenhouse gas emission target for Toronto by 2050 or sooner and required the Environment and Climate Division (formerly Environment and Energy) to report back on the feasibility of actions to achieve net zero by 2040.
https://secure.toronto.ca/council/agenda-item.do?item=2019.MM10.3

At its July 4, 2017 meeting, City Council unanimously adopted TransformTO: Climate Action for a Healthy, Equitable and Prosperous Toronto, the City's climate action strategy to meet Council's long-term GHG-reduction target while creating an equitable, healthy, prosperous and resilient Toronto that benefits all).
https://secure.toronto.ca/council/agenda-item.do?item=2017.PE19.4

COMMENTS

The first year (2023) of TO Live's 5-year Strategic Plan included a key objective to become a leader in environmental sustainability. This key objective was framed by the City's TransformTO Net Zero Strategy ("NZS"), which required City-owned buildings to reach net zero greenhouse gas (GHG) emissions by 2040, with an interim 2030 goal of a 60 percent reduction of (GHG) emissions from 2008 levels.

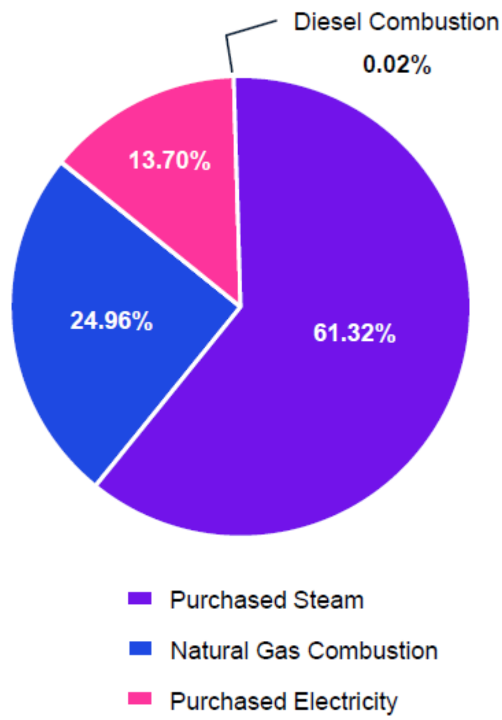
Guiding TO Live in achieving its objective and the NZS, in consultation with the City's Environment and Climate division, TO Live embarked on a competitive public procurement process to seek an organization to help TO Live plan its transition to net-zero GHG emissions from its venues. KPMG was selected as the successful proponent to provide a report containing the following guidance:

- Establish emission baselines for TO Live venues.
- Make recommendations for GHG reduction pathways.
- Prepare TO Live for the City's inaugural carbon and future emission budgets, as outlined in the NZS and detailed in new City bylaws.
- Recommend changes to TO Live's 10-year capital plan and budget to meet the requirements of the NZS.

Attachment 1 contains KPMG's final report. The report focused on Meridian Hall and the Meridian Arts Centre ("MAC"). The St. Lawrence Centre for the Arts ("STLC") was not considered due to its redevelopment and the requirement for new construction to meet the Toronto Green Standard Version 4 (TGS v4). TGS v4 meets both the objectives of TO Live's Strategic Plan and the NZS.

Baseline Emissions

As the chart below indicates, purchased steam accounts for over 61% of TO Live's building emissions.



These emissions are detailed by venue and emission type and are expressed in metric tons of carbon dioxide equivalent (tCO_2e).

2023 Facility Emissions (tCO2e)					
Location	**Natural Gas**	**Electricity**	**Steam**	**Diesel**	**Total**
Meridian Hall	8.8	67.5	442.9	0.2	519.4
Meridian Arts Centre	243.7	47.9	0	0	291.6

The NZS requires City-owned buildings to reach net zero GHG emissions by 2040 with an interim target of a 60% reduction in GHG emissions by 2030. As is evident by the numbers noted above, TO Live must aggressively move away from steam and natural gas in the next few years to meet the 2030 interim targets.

The only way to eliminate gas and steam from Meridian Hall and the MAC will be to retrofit them. Doing so will be challenging due to each venue's age, size, diverse systems and ongoing programming.

Carbon Reduction Pathways

Over 24 technologies were explored to achieve carbon reductions within TO Live venues. The most significant opportunity for rapid carbon reduction involves switching from steam at Meridian Hall and natural gas at the MAC to alternative fuels. This switch is primarily related to heating the buildings, as electricity is already the primary energy source for cooling. Although reducing electricity usage for cooling will help overall strategies, the potential for carbon reduction is limited due to the low carbon emissions of Ontario's electrical grid.

As noted in Attachment 1, fuel switching presents two main pathways at Meridian Hall and one at the MAC. Each path offers different options, each with its opportunities and challenges. These options were evaluated against seven criteria: lifecycle costs, capital costs, operating costs, GHG reduction potential, suitability of the technology, implementation timeframe, and spatial impacts.

From the 24 technologies, six scenarios were shortlisted for deeper assessment. This included evaluating the cost per megawatt-hour over the technology's lifetime (Levelized Cost of Energy, LCOE), operating costs, capital costs, and GHG reduction potential (for a detailed explanation of LCOE, see page 32 in Attachment 1).

MERIDIAN HALL

Shortlisted scenarios include the following:

- Retain the steam system, make efficiency and control changes, and invest in a **steam-generating air source heat pump (ASHP).** Electric boiler backup to be provided combined with solar PV and high-efficiency chillers.

- Steam to hot water conversion, with Enwave still providing steam and TO Live converting it to hot water on-site combined with solar PV and high-efficiency chillers.

- Steam to hot water conversion and **Wastewater Energy Exchange (WEE)** with solar PV and high-efficiency chillers.

- Steam to hot water conversion and **Air Source Heat Pumps (ASHP)** with solar PV and high-efficiency chillers.

An overview of results below, with additional details noted in Attachment 1.

MERIDIAN HALL					
Criteria Assessed	**Business as Usual (BAU)**	**Steam ASHP**	**Hot Water**	**WEE**	**ASPH**
LCOE ($ / MWh)	-	1,450	534	864	863
Capital cost ($M 2024)	-	74.44	23.12	42.19	48.08

MERIDIAN HALL					
Avg annual operating cost ($M / year; avg over 25 years	0.79	0.46	0.56	0.32	0.30
GHG emissions abated (tCO2e/ year)	-	423.16	139.56	442.91	438.63

Wastewater Energy Exchange is being recommended for Meridian Hall as the preferred technology. It has the best opportunity to decrease GHG emissions and nearly identical operating and capital costs to the runner-up technology, ASHP. There are also opportunities to share infrastructure with the STLC redevelopment when connecting to the sewer under Scott Street between the STLC and Meridian Hall.

MERIDIAN ARTS CENTRE

Shortlisted scenarios include the following:

- Electrification using **Air Source Heat Pumps (ASHP)** with solar PV and high-efficiency chillers.

- Electrification using **Heat Recovery Chillers (HRC)** and electric boilers combined with solar PV and high-efficiency chillers.

An overview of results below, with additional details noted in Attachment 1.

MERIDIAN ARTS CENTRE			
Criteria Assessed	**Business as Usual (BAU)**	**ASHP**	**HRC**
LCOE ($ / MWh)	-	620	334
Capital cost ($M 2024)	-	20.78	4.93
Avg annual operating cost ($M / year; avg over 25 years)	0.20	0.26	0.39
GHG emissions abated (tCO2e/ year)	-	227.65	214.91

Heat recovery from the chilled water plant (HRC) is recommended for the MAC as the preferred technology. Although the operating cost is higher and the GHG reduction potential is marginally lower, the substantial difference in the LCOE and required capital makes HRC the most viable option.

A WWE and HRC project would be large and intrusive capital projects, significantly impacting the operations at each venue. Each project also contains investments in solar technology. In the case of the MAC, roof and façade repairs will also need to be addressed concurrently to support the solar enhancements, which will provide an opportunity to enhance energy efficiency. By combining these initiatives into one initial significant phase of work in the near future, TO Live will meet its NZS 2030 targets.

Management will likely need to shut down each venue to complete this first phase of work. The proposed costs include a premium for delivering the project under an accelerated model to account for this. Should funding for these projects be approved, Management will report back to the Board with details of the shutdown (estimated to last 2-3 months).

Management aims to minimize disruptions by ensuring each venue is shut down only once for work related to achieving net-zero carbon emissions. This first phase will require substantial investment, as detailed in the sections below, enabling TO Live to meet its net-zero obligations with minimal impact on its essential programs.

Carbon Budget Process

In 2023, City Council established the Climate Change Goals and Governance Bylaw to enhance transparency and accountability in achieving net zero greenhouse gas (GHG) emissions by 2040. This bylaw introduces essential procedures, including the City's annual "Carbon Budget" process. This report feeds directly into the Carbon Budget process, which identifies and prioritizes GHG reduction actions for inclusion in the City's annual budget. The first annual Carbon Budget process will commence in 2025. A high-level overview of this process is detailed below.

Submission of Proposals:

- All City Divisions, Agencies, and Corporations must submit high-level GHG reduction action proposals to the City's Financial Planning Division ("FPD") by May 30, 2024.

Screening:

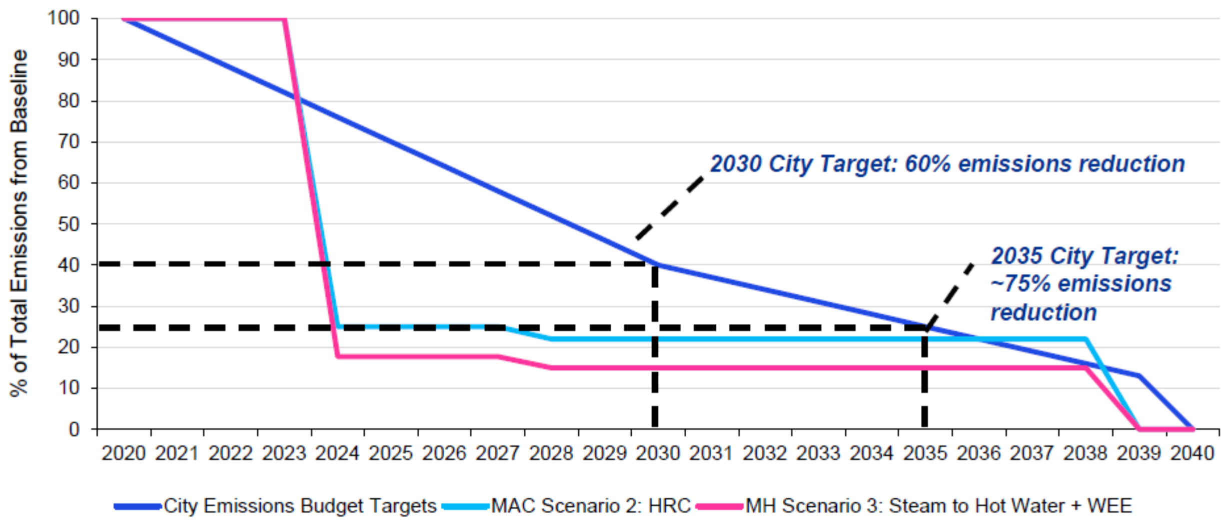
- The FPD will screen proposals for GHG reduction potential.
- Proposals that pass the screening will be notified by June 30, 2024.

Validation:

- Relevant staff from Divisions, Agencies, or Corporations will collaborate with the FPD to validate the financial information of the proposals.
- Validated proposals will be considered for inclusion in the City's 2025 planning process.

Emissions Budgets for TO Live

Attachment 1 includes an emissions budget for TO Live based on the proposed GHG reduction actions. If TO Live's proposals are approved for inclusion in the City's capital budget starting in 2025 and funding is maintained in subsequent years, this budget will establish future KPIs for TO Live related to GHG reduction. It will also provide a template for integration into the City's larger emissions budgets, as outlined in the Climate Change Goals and Governance Bylaw.



Updates to TO Live's 10-Year Capital Plan and Budget

Should TO Live's GHG reduction proposals be included in the City of Toronto's 2025 capital budget, an update to TO Live's 10-year Capital Plan and Budget will be required.

Attachment #1 contains proposed changes to TO Live's 10-year Capital Plan and Budget. Significant increases are necessary for TO Live to meet its obligations under the City's TransformTO Net Zero Strategy, with the 2030 target requiring urgent and substantial investment to be achieved. These proposed changes do not account for emerging priorities, such as a new building condition assessment currently underway at Meridian Hall.

Investments in GHG reduction projects will also help reduce the backlog of State of Good Repair ("SOGR") work needed in TO Live venues. The new infrastructure required for GHG reduction will replace much of the aging infrastructure, which contributes to the SOGR backlog and high operating costs.

Management and the FPD will collaborate to establish a recommended TO Live annual capital budget. The Carbon Budget Process will inform this year's capital budget discussions. At its September 20, 2024 TO Live Board meeting, Management will propose a new 10-year capital plan and budget for the Board's approval based on discussions with the City's FPD.

As detailed in Attachment 1, the estimated total cost for TO Live to transition to net-zero carbon emissions by 2040 is approximately **$55.448 million**. In TO Live's current 10-year capital plan and budget, $26.931 million had been previously allotted as a placeholder for a portion of the projects anticipated from the attached report. With an understanding of the scope of work necessary for TO Live to achieve net-zero carbon emissions, many items anticipated in future Building Condition Assessments ("BCA") will be addressed as part of the net-zero work.

Management, therefore, estimates that up to $9 million previously allocated for BCA recommendations could be reprioritized for net-zero-related work. This adjustment leaves an estimated total unfunded amount of approximately $19.518 million.

Item	**Amount ($M)**
Total Estimated Cost for Net-Zero	$55.448
Previously Allotted Funding for Net-Zero (Placeholder)	($26.931)
Reprioritized BCA Funds	($9)
Total Unfunded Amount	$19.517

$54 million has been marked as capital backlog until a comprehensive net-zero transition program can be established. $19.517 million more is needed to achieve net zero, rather than the entire $54 million estimated initially before the creation of the transition plan.

CONTACT

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SIGNATURE

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ATTACHMENTS

Attachment 1 - Net Zero Transition Program