POSTMEDIAPLACE

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July 31, 2025

RE: **<u>365 Bloor Decarbonization Roadmap</u>**

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365 Bloor has our Net Zero Target that we publish on our web site as well as share with stakeholders.

This target is described and detailed in our:
***2025-05-24 365 Bloor Decarbonization Roadmap (Energy@Work) R*0**

Questions can be directed to myself, who has approved the roadmap that was prepared by Energy@Work.

Sincerely,

Alaric da Cunha
General Manager
Postmedia Place

May 2025

365 Bloor Street Decarbonization Roadmap

File:
2025-07-31 365 Bloor Decarbonization Roadmap (Energy@Work) R4

Objective: To provide a practical Decarbonization Roadmap for 365 Bloor Street East:
Target: <u>Net Zero by 2050</u>

Strategy will respect the Environmental, Social and Governance (ESG) objectives and consider the realities from the experience of past actions, what was achieved and what can be predicted. The roadmap is divided into:

Past Activities	Start of the Energy Management Action Plan (E-MAP) and to the end of OPSaver		
Present Activities	Starting at the end of 2024, using the Energy Star Portfolio Manager (ESPM)		
Future Actions	Short-term:	2025 to 2029	19% Reduction
	Mid-term:	2030 to 2040	41 % Reduction
	Long-term:	2041 to 2050	Tageting Net Zero by 2050

Approved by: ______________________________

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Prepared by:

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EXECUTIVE SUMMARY

Energy@Work developed 365 Bloor decarbonization roadmap to lead the building to Net Zero by 2050 considering the elimination of emissions from Natural Gas (Scope 1) with reduction and offsetting Electricity (Scope 2) emissions through market mechanisms in 2040 and beyond.

This Decarbonization Road Map outlines a practical, phased approach for 365 Bloor Street East with a focuses on actions aligned with Environmental, Social, and Governance (ESG) commitments. It builds on an established energy and GHG 2024 baseline and prioritizes verifiable, flexible steps to reduce emissions while adapting to evolving technology and policy landscapes.

The Decarbonization roadmap is based on the following principles:

1) GHG reduction importance: Actions must be practical with verifiable results.

2) Firm but flexible. Change is inevitable, inflection points unpredictable and the need to pivot essential.

3) Process vs destination: Important to have confidence in taking each 'next step'.

Based on these principles, best practices, and review of available information as well as advice from the private sector we used our experience to provide this roadmap.

The starting point is reintroducing the Energy Management Action Plan (E-MAP). This has demonstrated verified results and includes a Measurement and Verification (M&V) plan for Scope and Scope 2.

From the 2024 baseline, the predicted annual GHG emissions are shown in Figure #1.

Targets and reductions are discussed in Section 3.0

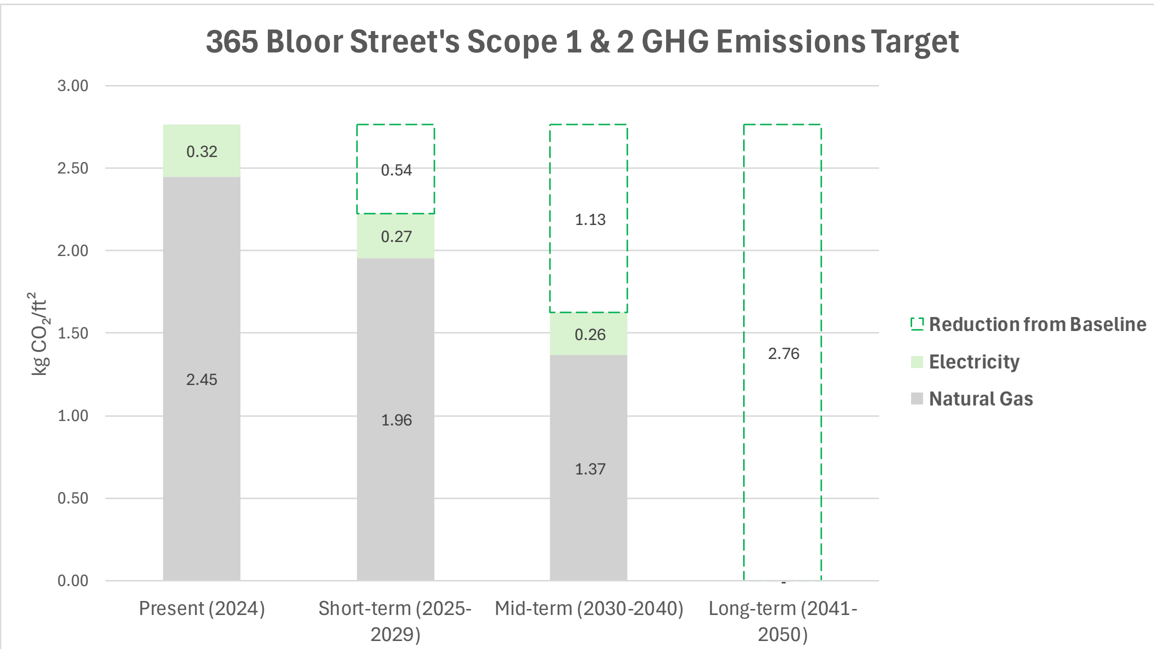
Short Term: Are achieved from energy efficiency, incentive programs and low cost measures
Medium Term: Right sizing heating with heat recovery and fuel switching
Long Term: Major capital investment as well as Market Mechanism (MM)

The goal is to achieve net zero by 2050 and do so with practical and affordable measures that rely on market mechanism for the residual emissions once other options are in place.

Figure #1

365 Bloor Street Emissions and Reduction Targets

	Present (2024)	Short-term (2025-2029)		Mid-term (2030-2040)		Long-term (2041-2050)	
	Emissions ($kg CO_2/ft^2$)	Reduction ($kg CO_2/ft^2$)	Emissions ($kg CO_2/ft^2$)	Reduction ($kg CO_2/ft^2$)	Emissions ($kg CO_2/ft^2$)	Reduction ($kg CO_2/ft^2$)	Emissions ($kg CO_2/ft^2$)
Natural Gas	2.45	0.49	1.96	0.59	1.37	1.37	-
Electricity	0.32	0.05	0.27	0.01	0.26	0.26	-
Total	2.76	0.54	2.23	0.60	1.63	1.63	-



2025-07-29 365 Bloor GHG Baseline_Target (Energy@Work) R6

G:\.shortcut-targets-by-id\1MBPg5TTNSuR28p1celnatDADAVHyz1b0\EnergyShare\1.0 E@W Clients\365 Bloor - Greenrock\Decarbonization Report 2025\Emission Reductions

The Decarbonization roadmap is an on-going commitment to reduce carbon. As new information becomes available, the management and operation team will be proactively engaged and prepared to take the necessary actions by having the Energy Management Action Plan (E-MAP) updated and active. Having a history of achieving verified results reinforces the confidence to meet targets as well as reporting tools, such as the Measurement and Verification (M&V) Plan that is internationally recognized by using EVO's IPMVP methodology.

We appreciate the opportunity to contribute to this important project that will make a very real and positive contribution to the climate challenge!

Thank you

Energy@Work

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1.0 INTRODUCTION

1.1 Overview

365 Bloor Street East is a mixed-use commercial building with retail tenant on the ground floor. Notably, it houses the head office of National Post, also known as Post Media Place, and is connected to the mall at 345 Bloor Street East. Refer to: https://www.postmediaplace.com

Defining the Challenge: Heating and Humidification

Environmental Challenge:
Environment Canada highlights the significant challenge faced by commercial buildings in addressing their heating and humidification needs. The 2030 EMISSIONS REDUCTION PLAN: Canada's Next Steps for Clean Air and a Strong Economy states that: over *85% of emissions from the building sector stem from space and water heating, largely due to fossil fuel equipment such as natural gas furnaces. Additional emissions are generated by the increased energy demand for heating and cooling buildings with insufficient envelope performance. The remaining emissions arise from electricity used for lighting, appliances, and other auxiliary equipment.*
2030 Emissions Reduction Plan – Canada's Next Steps for Clean Air and a Strong Economy - Canada.ca

Governments have initiated several measures to combat this, including:
i) Tax credits for energy efficiency upgrades
ii) Retrofit financing programs
iii) The Federal Greenhouse Gas (GHG) Offset System under the Greenhouse Gas Pollution Pricing Act (GGPPA)

Therefore, the Decarbonization Roadmap has been developed with the following guiding principles:
1) GHG reduction importance: Actions must be practical with verifiable results.
Realistic, solutions are presented for the short, medium, and long-term.

2) Firm but flexible. Change is inevitable, inflection points unpredictable and the need to pivot essential.
Adaptability to future considerations. As net zero commitment matures and evolves, we anticipate new opportunities, better technologies, and lower-cost solutions.

3) Process vs destination: Important to have confidence in taking each 'next step'.
Environmental, Social, and Governance (ESG) Commitments are included as part of the process.

Key Considerations:
In the short to medium term, strategies like purchasing Market Mechanisms (e.g., Carbon Credits (CC) and Renewable Natural Gas (RNG)) to offset emissions were considered but ultimately rejected due to market acceptance of 'buying net zero' as well as cost-effectiveness.

Similarly, high-capital solutions such as window replacements or full heating system conversions were considered but deferred to avoid large upfront investments. These will be revisited as more viable options become commercially available.

1.2 Principles

The Decarbonization Plan for 365 Bloor Street East integrates best practices derived from a variety of credible sources, alongside recommendations from industry groups and peer reviews. A key consideration throughout the development process was the need to respect diverse opinions on Environmental, Social, and Governance (ESG) value. The inclusion of options that are economically unfeasible, overly risky, or impractical could undermine the value of practical, actionable solutions. These insights led to the adoption of these principles:

1.2.1 GHG reduction importance: Actions must be practical with verifiable results.

Accurate, third-party verified data is essential for the credibility of a decarbonization plan. It is critical that input data be sourced directly from utility bills and supported by real-time monitoring. Detecting discrepancies, catching utility billing errors or having estimated bills are important to note. Accuracy allows GHG reductions to be verified by third parties to avoid the risk of being accused of greenwashing, particularly considering Canada's Federal Bill C-59 that protects against greenwashing.

1.2.2 Firm but flexible. Change is inevitable, inflection points unpredictable and the need to pivot essential.

The strategy must allow for adjustments as inflection points arise, and new opportunities or risks emerge. While a strong, defined plan is crucial, it must retain flexibility to adapt to evolving circumstances. Inflection points may arise due to changes in regulations, market conditions, or urgent operational needs.

Examples of **negative inflection points** include:
i) A sudden mandate for net-zero emissions.
ii) Strict regulatory measures such as New York City's Local Law 97, which imposes an emissions cap on buildings and is proposed by the City of Toronto's: Building Emissions Performance Standard
iii) The urgent need to replace or upgrade critical equipment.

On the flip side, **positive inflection points** may include:
i) Participation in a government retrofit pilot program or additional funding opportunities. A notable example was: City of Toronto.: Deep-retrofit-challenge.
ii) Active investment opportunities, such as those offered by the Canadian Infrastructure Bank (CIB), which is seeking industry partners to help finance clean energy growth initiatives https://cib-bic.ca/en/sectors/green-infrastructure.
iii) New financial programs, such as those from CMHC offering funding to help multi-residential properties reduce GHG emissions.
Positive inflection points are expected to assist and help ensure readiness for:
a) Breakthrough technologies in net zero heating, cooling, and energy systems. These technologies are expected to mature despite the current political environment, particularly in the U.S.
b) Anticipated new standards, regulations, and financial incentives—such as municipal tax advantages based on specific GHG emissions.
c) Increased support for GHG reduction efforts through organizations like BOMA Toronto, REALpac, Sustainable Building Canada (SBC), ASHRAE, and the Toronto Atmospheric Fund (TAF). Energy@Work is a proactive member of these groups and an advocate for better conservation programs in the commercial sector.

1.2.3 Process vs destination: Important to have confidence in taking each 'next step'.

Decarbonization in commercial real estate (CRE) requires a process, not a destination. Progress is ongoing, and it takes time for regulations to be defined, funding mechanisms to evolve, and solutions to mature. At the same time, key activities such as Measurement and Verification (M&V), which ensure the integrity and credibility of results, must be in place and sustained. The ability to communicate decisions clearly and consistently is also vital for gaining buy-in from stakeholders.

Action should remain grounded in real-world results, enabling stakeholders to take each next step with confidence toward achieving long-term GHG reduction goals.

1.3 Immediate Challenges

1.3.1 High Temperature Heating Plant

Heating at 365 Bloor Street East is currently provided by natural gas boilers, which generate high-temperature heating water distributed through high-temperature end-use devices. The primary loop temperature is controlled based on the return water temperature, with adjustments made using the outdoor air temperature. The system operates within the following temperature ranges:

- **Occupied Periods**: 72°C (160°F) to 62°C (143°F)
- **Setback Mode**: 50°C (131°F) to 65°C (149°F)

However, the required heating water temperature cannot be achieved with **Heat Pumps (HP)** using current commercially available technology. This is because commercially available heat pumps can only generate low-temperature heating water, which does not meet the building's end use devices. The increased attention to TIER systems is growing and evolving into better solutions, refer to Appendix G: TIER Systems

1.3.2 Maturing of Technology

The push towards **Net Zero** is a recent development, and many of the technologies required to decarbonize the heating and cooling systems are maturing. Technologies such as large cold-climate **Air Source Heat Pumps (ASHP)**, **Water Source Heat Pumps (WSHP)**, affordable window replacements, and **PV window films** are still in the research and development stage and are not considered commercially viable.

1.3.3 Market Mechanism

Market Mechanisms (MM) for offsetting emissions include options such as **Carbon Credits (CC)**, **Renewable Energy Credits (REC)**, and **Renewable Natural Gas (RNG)**. Additionally, proposals like **Bruce Power's initiative** to further decarbonize the province's energy supply through new incremental nuclear power are being explored. Bruce Power: Help industries achieve net zero

Historically, Ontario's carbon market has undergone significant changes. In the 1990s, the **Pilot Emission Reduction Program (PERT)** allowed **Ontario Hydro's energy efficiency programs** to generate **$2 million in emission credits**. However, in 2018, Ontario cancelled its **cap-and-trade program**, which had been linked to California and Quebec's **Western Climate Initiative**. This shift led to Ontario's **non-compliance** with Canada's national **GHG pricing standards**, prompting the federal government to implement its **carbon pricing system** in the province.

In response, Ontario introduced the **Emissions Performance Standards (EPS)** program in **January 2022**. The EPS program applies to **large industrial emitters** and sets **facility-specific emissions limits**. If a facility exceeds its emissions limit, it must purchase **Excess Emissions Units (EEUs)** to comply.

1.3.4 A PESTLE Analysis

PESTLE analysis examines the Political, Economic, Social, Technological, Legal, and Environmental factors impacting an organization. These change over time and businesses aware and alert to the potential impact of these external forces are better positioned to respond to opportunities as well as threats to illustrate, these three areas are discussed Political forces, Grid Resilience

Political Forces

Municipal

City of Toronto has committed to a net zero target by 2040. Details are being developed.
https://www.toronto.ca/news/net-zero-by-2040-city-council-adopts-ambitious-climate-strategy

Provincial

The provincial government appears to be moving in a different direction. The most recent directive to the ieso is for gas fired generation to be acquired for electricity production as early as 2025/26. Ontario's Climate Change Strategy does not mention Net Zero and there has been no public commitment.
https://docs.ontario.ca/documents/4928/climate-change-strategy-en.pdf

Federal

Canada has made a firm public commitment:
i) 2030 Emissions Reduction Plan – Canada's Next Steps for Clean Air and a Strong Economy
https://www.canada.ca/en/environment-climate-change/news/2022/03/2030-emissions-reduction-plan--canadas-next-steps-for-clean-air-and-a-strong-economy.html
ii) 2050 Net Zero Challenge
Canada.ca Net-zero-emissions-2050.html
On April 1st, 2025 the carbon tax was reduced to zero and with the federal election, a new mandate is expected but it is not clear if the carbon tax will return or another approach will take its place.

Grid Resilience

Ontario's ability to meet net zero commitments through electrification is seriously in question. The recent presentation by the Ministry of Energy (MoE) was very clear that Ontario's surplus of electricity days is over. Toronto growth continues and the commercial sector commitments to be Net Zero begs the question of the province and Toronto Hydro's ability to respond to Net Zero commitments through electrification.

Commercial Real Estate (CRE) Confidence in the value of achieving Net Zero

Confidence in achieving net zero requires the continued belief in the value. There are too very few examples to support the wholesale adoption of Net Zero in the short or medium term.

2.0 SIX STEPS TO ACHIEVE NET ZERO BY 2050

Energy@Work developed a phased decarbonization roadmap that was recognized through the 2023 HOOPP LEAP GHG Manager Award for 4711 Yonge Street. This balanced short-term operational improvements with long-term capital planning, supported by verified data and external funding opportunities.

The award-winning plan was implemented at 4711 Yonge, a 390,000 sq. ft., 16-storey, Class-A office building built in 1987 and managed by Menkes Property Management. The plan included a structured approach to both Scope 1 and 2 emissions, incorporated interim targets, and demonstrated innovation in funding and execution. Source: HOOPP LEAP Award Announcement

The 365 Bloor Street Decarbonization Plan applies the same foundational approach, adapted to reflect the building's specific systems, operational realities, and budget. The strategy is practical, scalable, and aligned with the Canada 2050 net-zero target.
Focus is on:

Scope 1: Direct emissions from natural gas (Enbridge) and
Scope 2: Indirect emissions from electricity use (Toronto Hydro).

The Six-Step Path to Net Zero

This sequential, staged approach allows for flexibility and progress over time, while integrating key measures within each phase.

There are the following 6 sequential steps:

Short Term: 2025 to 2029

Step 1: Benchmark Emissions Using Verified GHG Emission Factors (Scope 1 & 2)
Step 2: Establish Current Facility Requirements (CFR), Assess System Performance and Explore Incentives

Mid-Term: 2030 to 2040

Step 3: Right-Size Systems Using Needs Assessment, Waste Elimination, and Smart Controls
Step 4: Invest in Heat Recovery to Reuse Internal Energy

Long Term: 2041 to 2050

Step 5: Transition from Fossil Fuels to Electrified, Low-Carbon Thermal Systems
Step 6: Offset Residual Emissions Through Verified Market Mechanisms

2.1 Short Term: 2025 to 2029

STEP 1: Benchmark Emissions Using Verified GHG Emission Factors (Scope 1 & 2)

Objective: Establish a measurable, reportable, and transparent energy and emissions baseline.

Actions:

Inventory of Scope 1 (natural gas combustion) and Scope 2 (electricity use) emissions. Apply approved GHG emission factors (e.g., Environment Canada's National Inventory Report, IPCC).

Leverage proven and reputable tools:

Use Energy@Work's Energy Management Action Plan (E-MAP)

Update the Measurement and Verification (M&V) Plan:
EVO's International Performance Measurement and Verification Protocol (IPMVP)
https://evo-world.org/en/products-services-mainmenu-en/protocols/ipmvp

Natural Resources Canada's RETScreen® Expert
https://natural-resources.canada.ca/maps-tools-publications/tools-applications/retscreen

Outcome: A robust, auditable baseline that informs planning, facilitates progress tracking, and enables ROI justification.

STEP 2: ESTABLISH CURRENT FACILITY REQUIREMENTS (CFR), ASSESS SYSTEM PERFORMANCE AND EXPLORE INCENTIVES

Objective: Define building needs to align decarbonization with user and asset requirements as well as available incentive programs.

Actions:

- Document Current Facility Requirements (CFR):
  Occupancy schedules, space use, internal loads, and comfort parameters.
- Audit systems: HVAC, lighting, domestic hot water, and building envelope.
- Identify equipment nearing end-of-life or performing below benchmark efficiency.
- Explore available programs from Enbridge, Toronto Hydro, SaveOnEnergy and others.

Outcome: A detailed profile of the building systems, building needs to inform right-sizing and investment priorities with the support of incentive programs.

2.2 Medium Term: 2030 to 2040

STEP 3: RIGHT-SIZE SYSTEMS USING NEEDS ASSESSMENT, WASTE ELIMINATION, AND SMART CONTROLS

Objective: Reduce energy demand through targeted efficiency improvements before electrification.

Actions:

- Remove oversized, redundant, or inefficient equipment.
- Install high-efficiency systems (e.g., ECM motors, variable speed drives, commercial-grade heat pumps).
- Integrate Building Automation Systems (BAS) with advanced analytics for real-time optimization.

Outcome: Lower energy use intensity (EUI) minimized system capacity needs, and enhanced control responsiveness.

STEP 4: INVEST IN HEAT RECOVERY TO REUSE INTERNAL ENERGY

Objective: Reclaim waste heat to reduce primary heating and cooling loads.

Action:
Identify heat sources: exhaust air, data centers, mechanical rooms, compressors.

Implement:

- Heat Recovery Ventilators (HRVs) – air-to-air energy recovery.
- Runaround loops – for systems where supply/exhaust are not co-located.
- Assess heat cascading opportunities for stepped energy reuse across systems.

Outcome: Improved energy efficiency, reduced GHG emissions, and enhanced thermal recovery integration.

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2.3 Long Term: 2041 to 2050

STEP 5: TRANSITION FROM FOSSIL FUELS TO ELECTRIFIED, LOW-CARBON THERMAL SYSTEMS

Objective: Improve building envelopes and replace fossil-based heating systems to align with the evolving low-carbon grid.

Actions:

- Replace single pane windows with double or triple pane, or available future alternatives. The selection will depend on the business case.
- Replace hybrid heating plant with electric boilers or commercial-grade high-temperature heat pumps.
- Prioritize heat pumps with CO_2 or low-GWP refrigerants (e.g., R-744).
- Design for vertical system integration (e.g., stacked plant rooms, vertical distribution) to optimize hydronic performance and reduce losses.

Outcome: Elimination of Scope 1 emissions from combustion; scalable design for future-ready systems.

STEP 6: OFFSET RESIDUAL EMISSIONS THROUGH VERIFIED MARKET MECHANISMS

Objective: Address emissions that remain beyond technical or economic feasibility.

Actions:

- Purchase Renewable Energy Certificates (RECs) for residual Scope 2 electricity use.
- Ensure credits are third-party certified (e.g., Gold Standard, Verified Carbon Standard, Green-e).

Outcome: Credible pathway to net-zero while supporting external climate solutions.

3.0 IMPLEMENTATION

3.1 Short Term: (2025 to 2029), Step 1 and 2

STEP #1: BENCHMARK EMISSIONS USING VERIFIED GHG EMISSION FACTORS (SCOPE 1 & 2)

365 Bloor had an aggressive Energy Management Action Plan (E-MAP) that started in 2016. Specific achievements included:
Completion of the ASHRAE Level 2 Energy Audit, file: **2017-05-23 365 Bloor Audit Report R3**

The E-MAP included a GHG baseline for natural gas (Scope 1) and electricity (Scope 2) use. Consumption was tracked, assessed and reported monthly. This was also entered into Energy Star Portfolio Manager (ESPM) for both the City of Toronto and Ministry of Energy Annual Reporting. To further protect the data in ESPM, a license for RETScreen was obtained and transferred in the event Energy Star is closed by the Trump administration.

The electricity Measurement and Verification (M&V) Plan was developed in response to Toronto Hydro Conservation and Demand Management (CDM) program called OPSaver. Toronto Hydro reviewed and approved the E-MAP as well as the M&V Plan based on Efficiency Valuation Organization (EVO) International Performance Measurement and Verification Protocol (IPMVP®). IPMVP® was selected because it:
i) is an internationally respected protocol, accepted by Toronto Hydro for electricity savings,
ii) it is also recommended by the ieso for retrofit submissions, the Energy Performance Program (EPP) and the proposed Existing Building Commissioning (EBCx) program, and
iii) the international M&V community relies on IPMVP® for calculating and verifying energy efficiency.
https://evo-world.org/en/

A M&V Plan was also prepared for natural gas like the electricity M&V Plan. Thus, both utilities have a solid baseline and starting point as the GHG baseline.

E-MAP is an ongoing activity to analyze Scope 1 and 2 from Toronto Hydro and Enbridge bills with additional support from real time monitoring (RTM) data on the main Toronto Hydro meter. The hourly interval data and results allow operations to prioritize monthly actions to produce savings. The following are specific examples of completed projects.

i) Toronto Hydro's OPSaver Program, refer to Appendix A

Over 600,000 kWh saved and verified by Toronto Hydro for a 14.5% reduction. In 2020 the E-MAP was suspended due to a sharp drop in occupancy and uncertainty caused by COVID and the work from home model.

In April 2025 the E-MAP was re-instated and the first E-MAP meeting was held in March 2025 with plans to resume monthly E-MAP activities with operations and management.

STEP #2: ESTABLISH CURRENT FACILITY REQUIREMENTS (CFR), ASSESS SYSTEM PERFORMANCE AND EXPLORE INCENTIVES

Step 2.1 Current Facility Requirement

The Current Facility Requirements (CFR) was developed, reviewed and approved by the General Manager, refer to file: ***2025-06-09 365 Bloor Street E CFR (Energy@Work)***

Step 2.2 365 Bloor Street East Building Description

Appendix H, describes 365 Bloor Street East Energy Using Systems.

Step 2.3 Exploring Incentives

Available incentives for commercial offices to reduce energy and thus decarbonize were explored.

Incentives will change and continue to evolve over time. The E-MAP provides a consistent review, assessment and recommends implementation where practical. This decarbonization roadmap considers energy efficiency as the first step and important decisions must be made to identify available tools and incentives.

The following were identified and implemented:

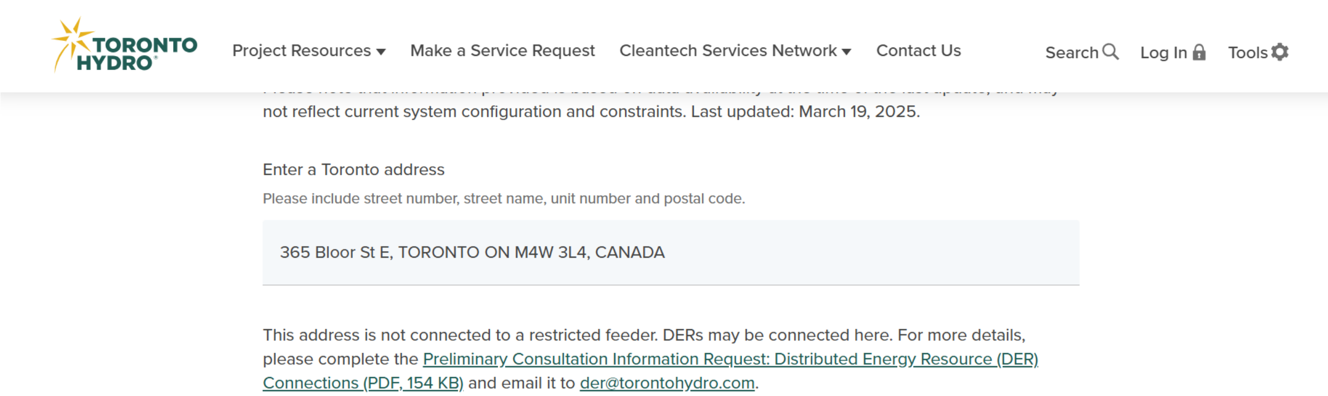
i) Toronto Hydro:

Toronto Hydro Climate Alliance Group developed several tools that were used to help develop the decarbonization roadmap, specifically:

i.1 Restricted Feeder Lookup Tool

The tool confirmed that there were no restrictions at this time for generation and/or storage facility, such as solar panels or a battery energy storage system, to connect to Toronto Hydro's grid.

The tool also provides direction on next steps if a either option becomes a possibility. Implementation would be considered in the medium to long term at this site.

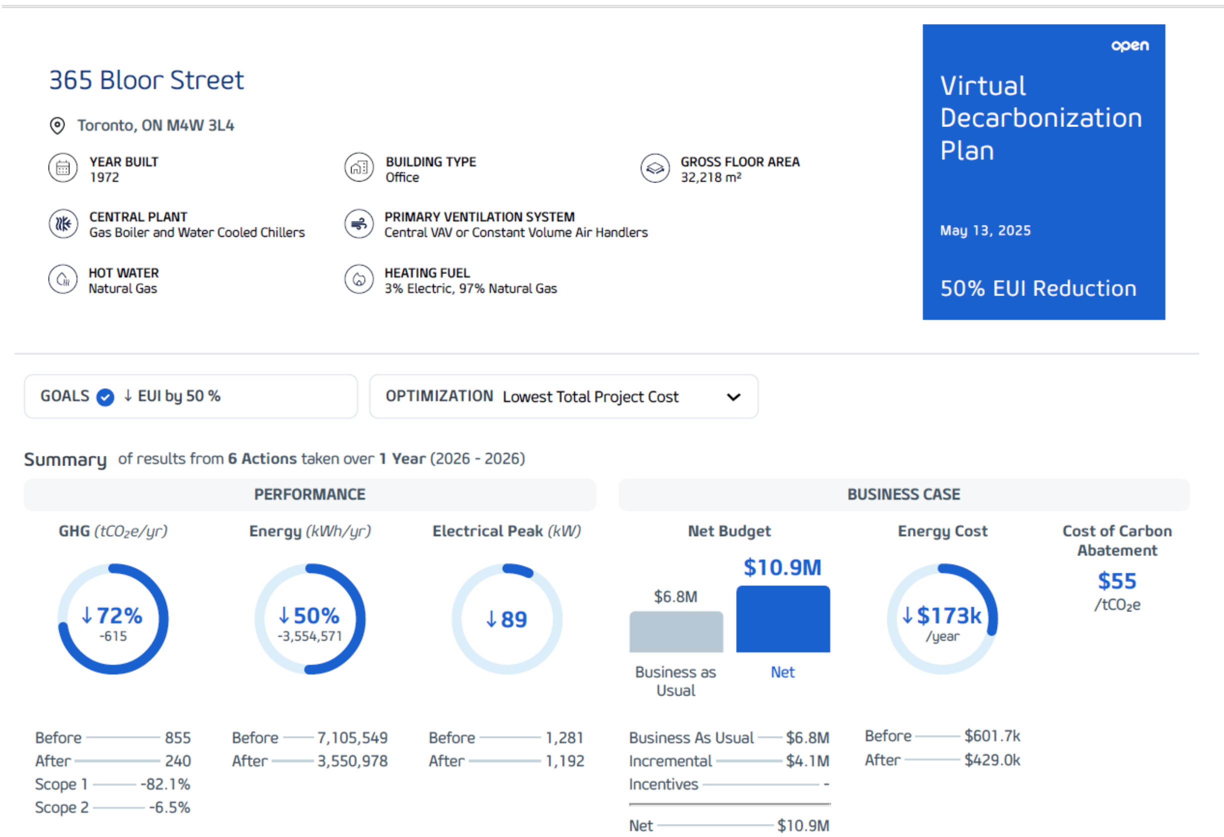


https://www.torontohydro.com/contractors-and-developers/restricted-feeder-lookup-tool

i.2 Virtual Decarbonization Plan (VDP)

Refer to: ***VDA_365 Bloor_May 13 25 -RESULT***

Toronto Hydro invested in the VDP tool to estimate the cost of decarbonization. The results are summarized below. The decarbonization roadmap considers the net budget of $10.9 million to be impractical in the short term in achieving an estimated 50% energy reduction with a 72% GHG reduction. The VDP also considers an estimated 2% contribution from solar energy, which is considered impractical at this site.



ii) Enbridge Demand Side Management (DSM):

The programs that are available to investigate opportunities are described below.

ii.1) Boiler Optimization Pilot: Refer to Study: ***2025-06-09 365 Bloor Boiler Op Pilot (Energy@Work***

Energy@Work was invited and approved to deliver this pilot program:

https://www.enbridgegas.com/ontario/business-industrial/incentives-conservation/energy-solutions-by-equipment/space-heating-ventilation-building-envelope/boilers

The results of the pilot will be provided in a separate study, scheduled to be complete in the Fall of 2025, in accordance with the Enbridge pilot requirements.

iii) SaveONenergy's eDSM

The IESO converted the conservation and demand management plan (CDM) to electricity Demand Side Management (eDSM). There is greater focus on demand reduction to provide supply relief. On June 30th, 2025 the program will be expanded with enhanced incentives, refer to:
https://saveonenergy.ca/News-and-Updates/June-2025-Retrofit-program-update
This is an example of a positive inflection point that can assist the implementation of decarbonization options.

iv) Additional Incentive Programs

Incentive programs continue to be pursued, such as the Existing Building Commissioning (EBCx). Planning phase will start in the fall of 2025 with investigation into 2026, implementation 2026-27 and transfer and persistence to be completed in 2028-29.

Other potential programs
* BOMA Canada Enspire:
https://bomaenspire.ca
Current program is called Building Performance Excellence (BPE). However, B&C buildings are eligible but must be between 20,000 and 200,000 sq.ft.

* City of Toronto is developing programs to assist in meeting the net zero target by 2040, such as Transform TO
https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/

Refer to Appendix C, City of Toronto Net Zero Study

These and other programs are reviewed as they are announced for short, medium and long term

iv) Energy Star Portfolio Manager (ESPM) saved to RETScreen

ESPM data was saved into a free license that was provided by NRCan to protect the historic data that resides in ESPM.

The Trump administration has said that Energy Star could be shut down as early as October 2025.

This will protect the ESPM data in the event ESPM is shut down or implodes from the lack of resources to sustain practical activity.

3.2 Short Term: (2025 to 2029) Target and Investment

3.2.1 Sustained Annual Investment

An annual investment to identify, implement and sustain results include the Energy Management Action Plan (E-MAP) which includes the Measurement and Verification Plan. Real time monitoring will continue monitoring the Toronto Hydro's electric meter. The potential to use Enbridge and the IESO treasure hunt funding is under consideration for 2026 as an annual event.

Energy Management Action Plan (E-MAP)

Maintaining an accurate energy baseline and GHG tracking system is needed to ensure that existing savings are sustained to a third-party standard. Although benchmarking may appear a simple task, building occupancy, weather, facility requirements, emission factors, etc. are subject to change and must be maintained. The three E-MAP objectives remain consistent with best practices, the focus being on consumption reduction through actions. Management and Operations are in full support at the monthly meeting. Recommendation to further improvement of E-MAP includes:

A) Continue to hold in-person operation and management meetings.

B) Communicating and engaging other stakeholders (tenants and investors) on the progress and continuous effort being made.

Real Time Monitoring on the Toronto Hydro Electric meter has proven very valuable in identifying opportunities and will continue

3.2.2 Net Zero Treasure Hunt

Building on the successful 2022 training, a net zero treasure hunt is proposed to focus on GHG reduction with funding from the ieso and Enbridge.

3.2.3 GHG Reduction Measures and Investment

Existing Building Commissioning is underway using the SaveOnEnergy EBCX program using NRCan's 4-Phase EBCX approach, refer to:

SaveOnEnergy.ca: Existing-Building-Commissioning-Program. and

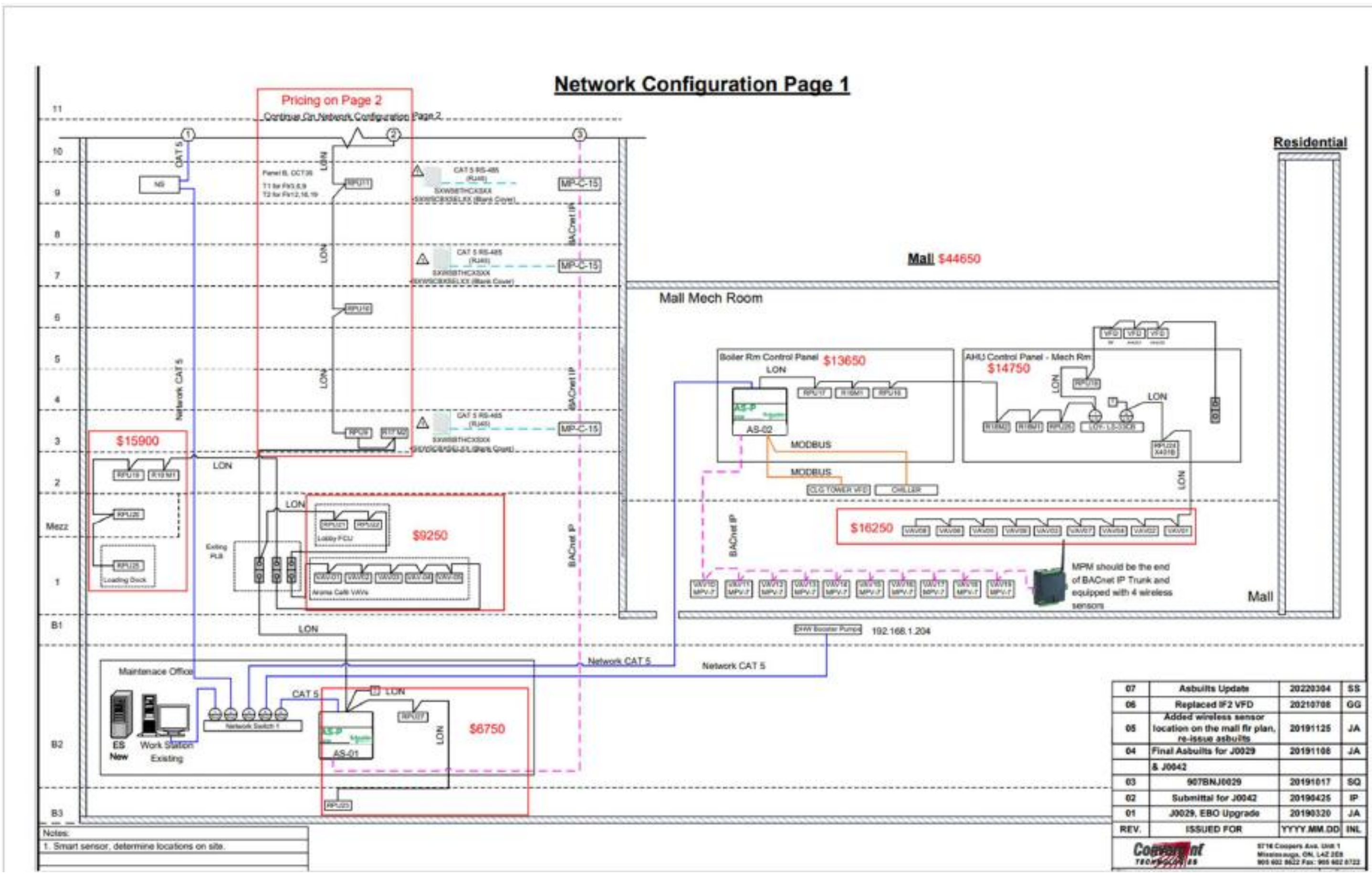
https://natural-resources.canada.ca/energy-efficiency/building-energy-efficiency/recommissioning-0

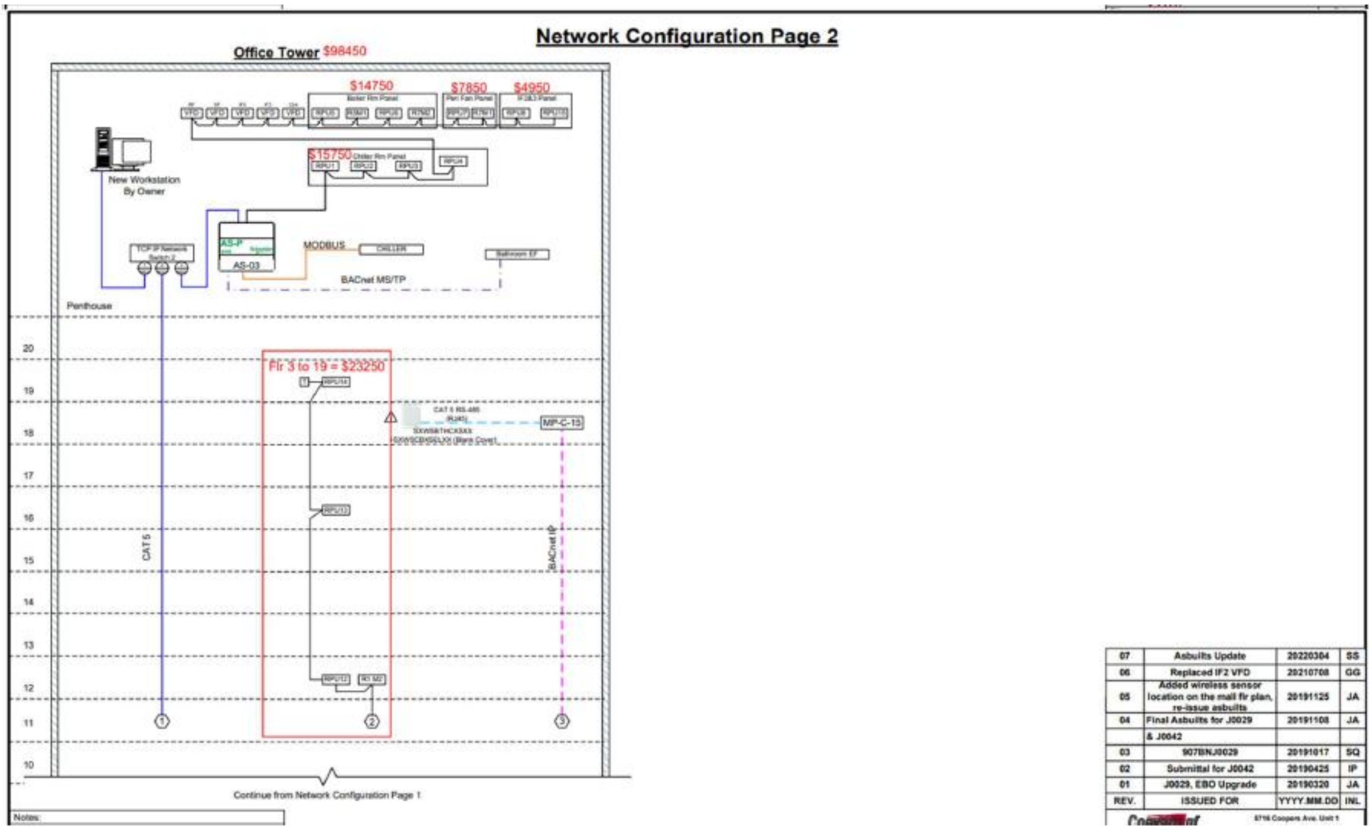
This link also includes this short video that explains the 4-phases as well as the 'Quality-Focused Process'

Enbridge invited Energy@Work to participate in a Boiler Optimization Pilot, refer to:
Enbridgegas.com: Boiler Optimization Pilot
The study is underway and expected to be completed by August with implementation complete by November as per the pilot's rules.

Convergint was asked and provided a detailed proposal to improved controls in parallel with the EBCX, refer to: 365 Bloor East - Xenta Upgrades - Convergint Proposal

Refer to the two Network Configurations, Page 1 and 2 with the following table providing the detailed description and cost.





PRICING TERMS & CONDITIONS

The following represents pricing for the Xenta controller upgrades:

Item No.	System Description	Cost
1	Office Tower: Boiler Room Control Panel	$14,750.00 + HST
2	Office Tower: Chiller Room Control Panel	$15,750.00 + HST
3	Office Tower: MUA1 Perimeter Fan Control Panel	$7,850.00 + HST
4	Office Tower: MUA 2&3 Interior Fan Control Panel	$4,950.00 + HST
5	Office Tower: Office Floor Control Panels (Qty of 6)	$23,250.00 + HST
6	Office Tower: Loading Dock, Mezz, and 2nd Floor Control Panels	$15,900.00 + HST
7	Office Tower: Lobby Fan Coil Units and VAV Controllers	$9,250.00 + HST
8	Office Tower: Maintenance Office B2 and B3 Control Panels	$6,750.00 + HST
9	Mall: Boiler & Chiller Room Control Panel	$13,650.00 + HST
10	Mall: AHU 1&2 Air Handling Unit Control Panel	$14,750.00 + HST
11	Mall: VAV01 to VAV09 Controllers	$16,250.00 + HST

- Note – 365 Bloor East Management, Energy@Work, and Convergint to collaborate on the specific systems that are applicable towards the Enbridge incentive program. Purchase order to indicate item number included in project initiative and total value for project investment.

Short Term Summary: 2025 to 2029

Table #1:

365 Bloor Street Short Term Target, Cost, Incentive and Target Reduction

GHG	2024	Natural Gas	2.45	kg CO_2/ft^2
		Electricity	0.32	kg CO_2/ft^2
		Total GHG	**2.76**	**kg CO_2/ft^2**

Item	Title	Description	Cost ($)	Incentive ($)	Net Cost ($)	Reduction Target	GHG Tonnes eCO2	Comment
3.1 Short-term: Preparation and GHG Reduction Measures and Investment: 2023 to 2025								
3.1.1 Sustained Annual Investment							2.76	**Emissions (kg CO_2/ft^2)**
3.1.1.1	**Annual E-MAP**	Energy Management Action Plan + M&V	$ 21,830	$ -	$ 21,830			E-MAP is the foundation to engage operations and management in pursuit of sustaining savings and
3.1.1.2	**Real time Monitoring**		$ 2,340	$ -	$ 2,340			
3.1.1.3	**Net Zero Treasure Hunt**	Operating a Net Zero building	$ 10,000	$ 7,500	$ 2,500			Enbridge and IESO training funding is available
		Total	$ 34,170	$ 7,500	$ 26,670			
3.2.2 GHG Reduction Measures and Investments								
3.2.2.1	**EBCx**	Existing Building Commissioning	$ 27,743	$ 20,807	$ 6,936			NRCan's 4 Phase approach is recommended as well as using the IESO EBCx program. Saving are consistent with THES Virtual Decarbonizaation Audit
						15%	0.37	Natural Gas GHG Reduction
						12%	0.04	Electricity GHG Reduction
	Phase 1	Planning (2025)						
	Phase 2	Investigation (2025-26)						
	Phase 3	Implementation (2026027)						
	Phase 4	Persistence and Training (2027-29)						
3.2.2.2	**Enbridge Boiler Optimization Pilot**		$ 20,000	$ 20,000	$ -			FDD can typically be provided by BAS provider
						2%	0.05	Natural Gas GHG Reduction
						0%	-	Electricity GHG Reduction
3.2.2.3	**Convergint Control Upgrade**		$ 143,100	$ 66,667	$ 76,433			Refer to quotation and costs
						3%	0.07	Natural Gas GHG Reduction
						3%	0.01	Electricity GHG Reduction
		Total GHG Reduction	$ 205,843	$ 107,474	$ 98,369	Total GHG Reduction	0.54	**2025-2029 Reduction**
							2.23	**2030 Mid-Term kg eC02/ft^2.yr**

2025-07-29 365 Bloor GHG Baseline_Target (Energy@Work) R6

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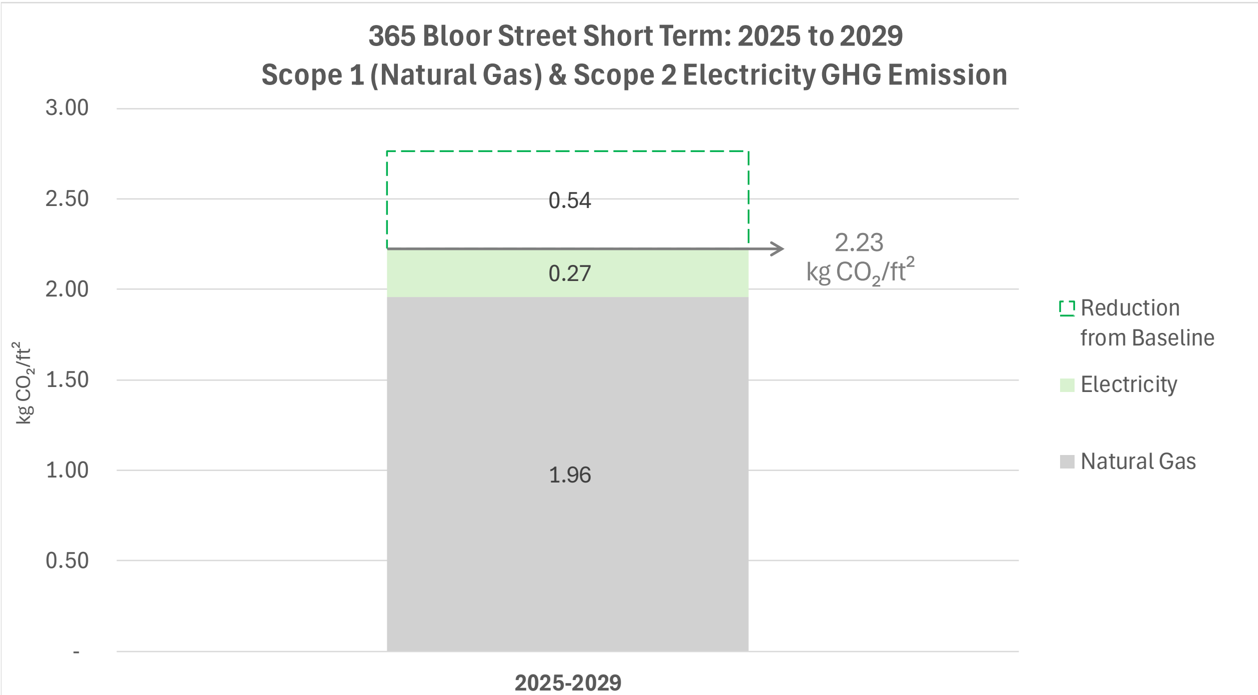
Figure #2:



2025-07-29 365 Bloor GHG Baseline_Target (Energy@Work) R6

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3.2 Short Term 'Snapshot" (2025 to 2029):

Step #1

365 Bloor re-established the E-MAP as well as a reliable energy and GHG baseline with third party review and approval by adopting an International Standard capable of defending Canada's anti-greenwashing legislation, Bill C-59.

The baseline and reduction target were re-established to deliver the decarbonization roadmap.

Steps #2

The CFR was established with enrollment in Toronto Hydro's programs, SaveOnEnergy's EBCX and Enbridge Boiler Optimization Program. The ESPM data was saved into RETScreen with the support from Natural Resources Canada (NRCan).

An estimated 0.54 kg eCO2/sq. ft can be reduced at a net cost of $98,369

3.3 Medium Term: 2030 to 2040

STEP 3: RIGHT-SIZE SYSTEMS USING NEEDS ASSESSMENT, WASTE ELIMINATION, AND SMART CONTROLS

Objective: Reduce energy demand through targeted efficiency improvements before electrification.

Actions:
The results from the Boiler Optimization Pilot confirmed that the heating plan is oversized and can be right sized. In addition, control improvements can be expanded to commercial high heat pumps.

STEP 4: INVEST IN HEAT RECOVERY TO REUSE INTERNAL ENERGY

Objective: Reclaim waste heat to reduce primary heating and cooling loads.

Actions:
Identify heat sources: exhaust air, data centers, mechanical rooms, compressors.

Implement:

- Heat Recovery Ventilators (HRVs) – air-to-air energy recovery
- Runaround loops – for systems where supply/exhaust are not co-located
- Assess heat cascading opportunities for stepped energy reuse across systems.

Outcome: Improved energy efficiency, reduced GHG emissions, and enhanced thermal recovery integration.

3.4 Mid-Term: (2030 to 2040) Target and Investment

3.4.1 Sustained Annual Investment

An annual investment to identify, implement and sustain results include the Energy Management Action Plan (E-MAP) which includes the Measurement and Verification Plan. Real time monitoring will continue with monitoring the Toronto Hydro's electric meter. The potential to use Enbridge and the IESO treasure hunt funding is under consideration for 2026 as an annual event.

Energy Management Action Plan (E-MAP)

Maintaining an accurate energy baseline and GHG tracking system is needed to ensure that existing savings are sustained to a third-party standard. Although benchmarking may appear a simple task, building occupancy, weather, facility requirements, emission factors, etc. are subject to change and must be maintained. The three E-MAP objectives remain consistent with best practices, the focus being on consumption reduction through actions. Management and Operations are in full support at the monthly meeting. Recommendation to further improvement of E-MAP includes:
A) Continue to hold in-person operation and management meetings.
B) Communicating and engaging other stakeholders (tenants and investors) on the progress and continuous effort being made.

Real Time Monitoring on the Toronto Hydro Electric meter has proven very valuable in identifying opportunities and recommended to continue.

Based on the Short-Term progress, the decarbonization plan will be updated, and investments into future activities, dependent on:

* Development of support programs from utilities and governmental organizations, plus
* Advancements of technologies and available funding programs.

Special care will be taken to ensure that mid-term decisions support the long-term target of reaching net zero by 2050.

STEP 3: RIGHT-SIZE SYSTEMS USING NEEDS ASSESSMENT, WASTE ELIMINATION, AND SMART CONTROLS
STEP 4: INVEST IN HEAT RECOVERY TO REUSE INTERNAL ENERGY

Utilizing the available heat in winter for recovery is considered a priority for a lower carbon heating strategy. Possible sources of (direct and indirect) available heat in the building were studied as well as other options in Appendix B: Examples of Net Zero Options.

Operations assisted in collecting information, BAS trending and development of the heating and cooling schematics which were used to develop and evaluate these options.

For the purpose of meeting the immediate needs, the following mid-term measures were provided and will continue to be upgraded with new information as the short-term measures are completed with the assistance of the utility incentive programs.

3.4.2. Convert Domestic Hot Water to Heat Pump

The domestic hot water boiler can be replaced with a heat pump and was reviewed using Virtual Decarbonization Plan for the estimated cost and carbon reduction.

This is a mid-term option, and prices are expected to decline as the heat pumps become more commercially available.

3.4.3 Heat Recovery

The Virtual Decarbonization Plan was used to estimate the cost and carbon reduction. The result from the Boiler Optimization Pilot Program from Enbridge will be completed by the end of 2025 and used to refine this estimate.

3.4.4 Right Size the Heating Plant

There are 5 boilers with only 2 working at any time. Once the heating system is sized, the plant will be right sized to meet the Current Facility Requirements. In the interim, the budget number from the Building Condition Repot of one million will be retained.

Mid-term Discussion

A heating schematic is scheduled to locate the potential for Water Source Heat Pumps (WSHP) to recover a percentage of the heat that is rejected to the outside in the winter. The heat required for these terminal devices can be provided by low temperature heating water. Therefore, the heat can be supplied by HP solution instead of the central heating plant. Several possible solutions are available for either water-sourced (WSHP) or air-sourced (ASHP) HP and each will be reviewed as the schematic is developed to provide heating with the following additional benefits:

1. Decrease the required capacity of the central heating plant to reduce the future cost of a GHG reduction retrofit.
2. Recover the heat that is rejected through cooling tower (in the case of WSHP solution)
3. Provide higher reliability.

Heat Recovery Chiller

The virtual decarbonization plan suggested a heat recover chiller. The cost was $1.6 million for 55 tCo2e removed. This and other options will be considered during the long-term plan and incorporated with the TIER review previously discussed as technologies mature and become commercially affordable.

Mid-Term Summary: 2030 to 2040

Table #2:

365 Bloor Street Mid-Term Target, Cost, Incentive and Target Reduction

GHG	2029	Natural Gas	1.96	kg CO_2/ft^2
		Electricity	0.27	kg CO_2/ft^2
		Total GHG	**2.23**	**kg CO_2/ft^2**

3.2 Mid-term: Preparation and GHG Reduction Measures and Investment: 2030 to 2040

Item	Title	Description	Cost ($)	Incentive ($)	Net Cost ($)	Reduction Target	GHG Tonnes eCO2	Comment
3.2.1 Sustained Annual Investment							2.23	**Emissions (kg CO_2/ft^2)**
3.2.1.1	**Annual E-MAP**	Energy Management Action Plan + M&V	$ 22,922	$ -	$ 22,922			E-MAP is the foundation to engage operations and management in pursuit of sustaining savings and
3.2.1.2	**Real time Monitoring**		$ 2,457	$ -	$ 2,457			
		Total	$ 25,379	$ -	$ 25,379			
3.2.2 GHG Reduction Measures and Investments								
3.2.2.1	**Domistic Hot Water**	Convert To Heat Pump	$ 350,000	$ -	$ 350,000			Estimated Savinga and cost from THES VDP
						3%	0.07	Natural Gas GHG Reduction
							-	Electricity GHG Reduction
3.2.2.2	**Ventilation**	Heat recovery	$ 260,000	$ 5,000	$ 255,000			Estimated Savinga and cost from THES VDP
						2%	0.03	Natural Gas GHG Reduction
						1%	0.00	Electricity GHG Reduction
3.2.2.3	**Right size Heating Plant**	Replace Boiler and Circulating Pumps (End of Lif	$1,000,000		$1,000,000			
						25%	0.49	Natural Gas GHG Reduction
						1%	0.00	Electricity GHG Reduction
		Total GHG Reduction	$1,610,000	$ 5,000	$1,605,000	Total GHG Reduction	**0.59**	**2030-2040 Reduction**
							1.63	**2040 Mid-Term kg eC02/ft^2.yr**

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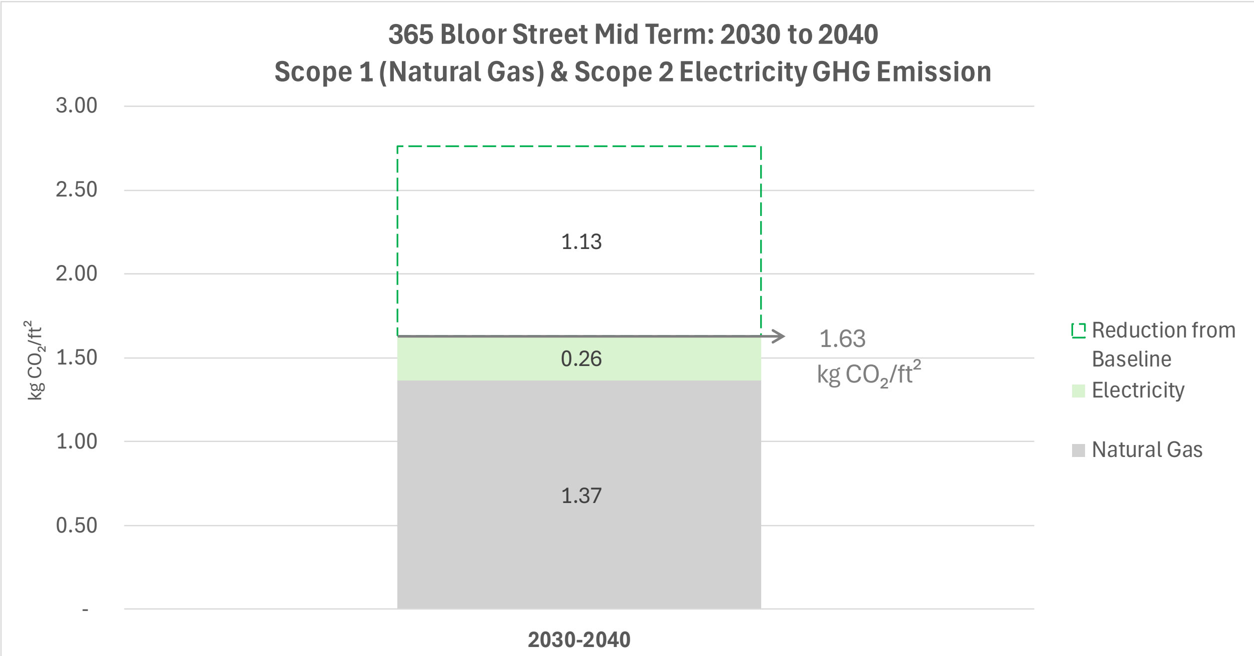
Figure #3:



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3.4 Mid- Term 'Snapshot" (2030 to 2040):
Step #3 and Step #4

The short-term measures that are underway and scheduled to be completed by 2029 will allow the Mid-term measures to be more accurately assessed. The present economic and political uncertainty is not allowing reliable estimates to be made for the mid-term.

An estimated 0.60 kg eCO2/sqft is provided at a net cost of $1,605,000

3.5 Long-term GHG Reduction Strategy: 2041 to 2050, Steps #5 and #6

The long-term GHG strategy is obviously the most challenging to predict and dependent on the success of the mid-term options and market conditions post 2040. The many variables and relevant issues are discussed in subsequent sections:
Section 4.0 Political and Grid Considerations
Section 5.0 Technology Advancements
Section 6.0 Market Mechanism / Greenwash / Green Sheen

365 Bloor Energy Management Action Plan (E-MAP) is expected to continue to evolve but has proven valuable and expected to continue as well as real time monitoring. Maintaining an accurate energy baseline, updated emission factors and GHG tracking system to ensure that existing savings are sustained to a third-party standard is essential.

STEP 5: TRANSITION FROM FOSSIL FUELS TO ELECTRIFIED, LOW-CARBON THERMAL SYSTEMS

The outcome for Mid-term will determine if the transition from fossil fuels to electrified, low -carbon thermal systems has occurred as suggested because the age of the boilers being converted as an asset renewal project.

If not a mid-term than forward to the long term.

Window Replacement to improve building envelop is the final and high-cost capital measure. Replacing the single pane windows with double or triple pane will be evaluated with future alternatives. The selection will depend on the best business case for the technologies and incentives that are available.

STEP 6: OFFSET RESIDUAL EMISSIONS THROUGH VERIFIED MARKET MECHANISMS

Offsetting residual greenhouse gas (GHG) emissions is our final step in the decarbonization process, applied only after feasible on-site and off-site mitigation measures have been implemented. This sequencing is aligned with best practices and follows a comprehensive PESTLE (Political, Economic, Social, Technological, Legal, and Environmental) analysis as discussed. Offsets should only be used for emissions that cannot be eliminated due to current technical or economic constraints. Here are **Five Reasons for Making Offsets the Final Step**

1. **Offsets Do Not Reduce Actual Emissions On-Site**
   Offsets are a financial mechanism, not a physical reduction in operational emissions. Prioritizing direct emission reductions aligns with both science-based targets and long-term net-zero goals.

2. **Risk of Reputational Greenwashing**
   Relying too early or too heavily on offsets, particularly unverified ones, can be viewed as greenwashing. Offsets must complement, not replace, real emission reductions to maintain credibility with investors, regulators, and the public.

3. **Offset Markets Are Evolving and Subject to Tightening Standards**
   Verified Carbon Standard (VCS), Gold Standard, and similar programs are raising the bar for what qualifies as a credible offset. Waiting until the final stages allows for access to more robust, traceable, and accepted mechanisms.

4. **Future Offset Costs Are Expected to Rise Substantially**
   As demand increases and supply becomes more constrained, carbon offset prices are projected to climb. By 2049, the **estimated cost per tonne CO_2e** is expected to be **$200–$300 CAD**, up from under $50 today, as highlighted by the Canadian Climate Institute and international carbon market forecasts.

5. **Offsets Can Support Global Equity Goals When Used Responsibly**
   When applied at the final stage, offsets can support high-quality international projects (e.g., reforestation, renewable energy access in low-income countries), contributing to broader sustainability goals without distracting from core decarbonization responsibilities.

The present cost of carbon credits or similar market mechanisms is quite modest. The future cost is very unpredictable, especially when the Canadian Carbon Tax was reduced to zero on April 1st, 2025 Vs incremental increases of $15 per tonne to $170 by 2030.

For the purpose of the plan a price of $238/tonne was selected and based on this Bloomberg report: https://about.bnef.com/insights/commodities/carbon-credits-face-biggest-test-yet-could-reach-238-ton-in-2050-according-to-bloombergnef-report/?utm_source=chatgpt.com

3.6 Long-Term: (2041 to 2050) Target and Investment

3.6.1 Sustained Annual Investment

An annual investment to identify, implement and sustain results include the Energy Management Action Plan (E-MAP) which includes the Measurement and Verification Plan. Real time monitoring will continue with monitoring the Toronto Hydro's electric meter. The potential to use Enbridge and the IESO treasure hunt funding is under consideration for 2026 as an annual event.

Energy Management Action Plan (E-MAP)

Maintaining an accurate energy baseline and GHG tracking system is needed to ensure that existing savings are sustained to a third-party standard. Although benchmarking may appear a simple task, building occupancy, weather, facility requirements, emission factors, etc. are subject to change and must be maintained. The three E-MAP objectives remain consistent with best practices, the focus being on consumption reduction through actions. Management and operations are in full support at the monthly meeting. Recommendation to further improvement of E-MAP includes:
A) Continue to hold in-person operation and management meetings.
B) Communicating and engaging other stakeholders (tenants and investors) on the progress and continuous effort being made.

Real Time Monitoring on the Toronto Hydro Electric meter has proven very valuable in identifying opportunities and recommended to continue.

Based on the Mid-Term progress, the decarbonization plan will be updated, and investments into future activities, dependent on:

* Development of support programs from utilities and governmental organizations, plus
* Advancements of technologies and available funding programs.

3.6.2 Replace the single pane windows

Better options are expected as technology improves and the need for more electricity in the urban setting increases. The largest real estate available is the vertical face of the commercial office towers and an obvious opportunity for vertical solar panels. Refer to Chapter 4.0.

3.6.3 Market Mechanism

The final choice to reach net zero by 2050 will be the use of Market Mechanism to offset residual emissions. It is expected that these will be mature and accepted as the practical solution with the required safeguards in place.

Long-Term Summary: 2041 to 2050

Table #3:

365 Bloor Street Long Term Target, Cost, Incentive and Target Reduction

GHG	2040	Natural Gas	1.37	kg CO_2/ft^2
		Electricity	0.26	kg CO_2/ft^2
		Total GHG	**1.63**	**kg CO_2/ft^2**

3.3 Long term: Preparation and GHG Reduction Measures and Investment: 2041 to 2050

Item	Title	Description	Cost ($)	Incentive ($)	Net Cost ($)	Reduction Target	GHG Tonnes eCO2	Comment
3.3.1 Sustained Annual Investment							1.63	Emissions (kg CO_2/ft^2)
3.3.1.1	**Annual E-MAP**	Energy Management Action Plan + M&V	$ 22,922	$ -	$ 22,922			E-MAP is the foundation to engage operations and management in pursuit of sustaining savings and
3.3.1.2	**Real time Monitoring**		$ 2,457	$ -	$ 2,457			
		Total	$ 25,379	$ -	$ 25,379			
3.3.2 GHG Reduction Measures and Investments								
3.3.2.1	**Replace Windows**	Double or Triple Pane Windows	$8,000,000	$100,000	$7,900,000			There may be incentives but too far out to estimate accurately and assume $100,000
						63%	1.02	Natural Gas GHG Reduction
							0.20	Electricity GHG Reduction
3.3.2.2	**Market Mechanism**	Purchase Cabon Credits	$ 28,175		$ 28,175			
						1%	0.34	Natural Gas GHG Reduction
						1%	0.07	Electricity GHG Reduction
		Total GHG Reduction	$8,028,175	$100,000	$7,928,175	Total GHG Reduction	1.63	**2041-2050 Reduction**
							-	**2050 kg eC02/ft^2.yr or Net Zero**

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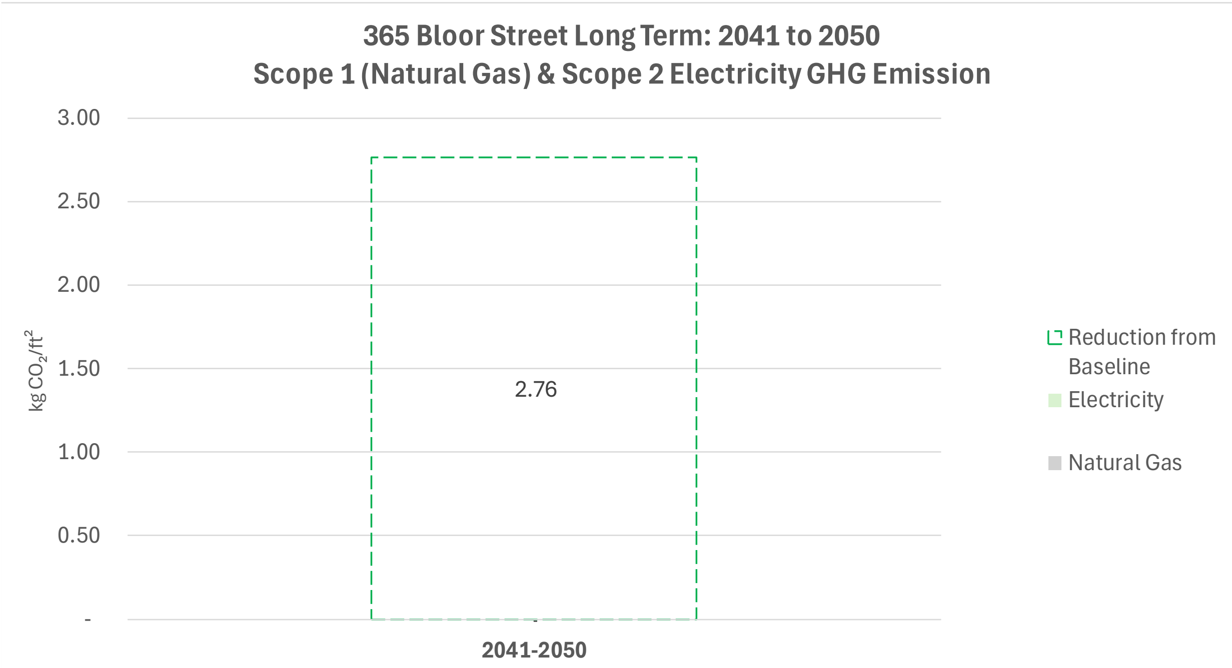
Figure #4:



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3.6 Long-Term 'Snapshot" (2041 to 2050): Step #5 and # 6

The final steps are obviously the most challenging to predict and heavily impacted by the success or failure of the short and mid-term options.

There is high confidence in the ability to achieve the short-term results from previous experience; however, achieving mid-term results will be heavily impacted by the many factors loosely described under the PESTLE analysis.

An estimated 1.63 kg eCO2/sqft can be reduced at a net cost of $7,928,175

4.0 ANTICIPATED TECHNOLOGY ADVANCEMENTS

The market demand to achieve net zero options is increasing investments in these and related technologies.

4.1 Window Replacement

4.1.1 High Efficiency Window

Window replacement is a popular GHG reduction measure by reducing heating demand though an improved building envelope. Although costly and rarely done as an energy efficiency measure, it may be required as an asset improvement measure.
Options such as triple glazed, low-e, argon-filled windows are available, though expensive.

An example was seen at Mohawk College as part of their net zero commitment:
https://www.mohawkcollege.ca/sustainability/buildings-and-energy/joyce-centre-for-partnership-and-innovation

4.1.2 Photo Voltaic (PV) windows

i) Transparent Solar panels and films
https://www.polysolar.co.uk/Datasheets/PS-CT-Transparent%20Technical%20Specification%20Sheet.pdf

ii) Next Energy Technologies PV Film

NEXT Energy Technologies

NEXT Energy Technologies has produced a proprietary transparent photovoltaic (PV) coating that transforms windows into energy-producing solar panels, allowing buildings to create on-site renewable electricity, thereby reducing carbon emissions and costs.

Daniel Emmett, co-founder and CEO, remarked:

> We are excited that NEXT Energy Technologies, Inc. is one of the Honourees of ENECHANGE Insight Ventures. Through ENECHANGE Insight Ventures, we look forward to developing more relationships in Japan's energy sector to help bring our mission of empowering windows that power our buildings and contribute to a more sustainable built environment. Our team is excited to work together to continue the global energy transition.

https://www.nextenergytech.com/nexthome

iii) PV windows were installed and inspected at the new Seneca facility.

This article provides some details and more information has been requested:
https://www.prnewswire.com/news-releases/belnor-engineering-installs-canadas-first-transparent-photovoltaic-glass-solar-window-at-torontos-seneca-college-300845927.html

4.2 High Temperature Heat Pumps

High-temperature heat pumps and related options, such as low heat distribution systems are helping to eliminate reliance on fossil fuel.

Breakthroughs are anticipated, such as:
https://ammonia21.com/norwegian-researchers-develop-worlds-hottest-heat-pump

Although the technology is not commercially available, the proof of concept is promising.

The growing international response will improve the possibility of breakthroughs, but these will remain long-term options.

4.3 Vertical Wind Generation

Development of vertical wind generation was discussed for urban applications to take advantage of the wind but also help abate wind tunnel impacts. These proved to be impractical for various reasons and have not become commercially viable.

Future Technology Advancement
The ability of the market to respond to demand and develop better options is proven. An accepted target of Net Zero by 2050 unleashes the market demand for net zero technology solutions with options in development.

5.0 MARKET MECHANISM/GREENWASH/GREEN SHEEN

Ontario had an active pilot program called the Pilot Emission Reduction Trading (PERT) Program in the late 90's. However, the pilot ended up trading and Ontario no longer has carbon trading. Therefore, carbon credits and other mechanisms are voluntary, with standards and regulations in development. Market understanding and investor confidence remains low.

PERT required Emission Reduction Credit (ERC) criteria [(1)] to be:
Real: An actual emission reduction has occurred due to a change in process /technology/operation.
Quantifiable: Must be a reliable and quantifiable basis for calculating the reduction.
Surplus: Must be more than any regulatory or voluntary commitments.
Duration: The ERC can be either continuous or discrete, depending on the creation strategy. Permanent process change create continuous ERC , when reversible changes produce discrete ERC.
Verifiable: The onus of verification for ERC is on the buyer.
The Ontario Hydro In-house Energy Efficiency program created a total ERC, between 1994 to 2001, of 2,588,695 tonnes of eCO_2
(1) *1994-2001 Energy Efficiency Project Results Summary, October 2002, Ontario Power Generation*

Although a formal 'Cap and Trade' for carbon is not in place in Ontario, experience is being developed and expected to provide a formal carbon credit and offset program in the mid-term. These will:
i) help reduce a property's carbon footprint.
ii) remain alert to developments and advancements in carbon trading and offerings.
iii) distinguish between the compliance and voluntary requirements.
iv) develop the appropriate screening criteria to measure the quality of the credit since not all credits are created or perceived to be equal.
v) develop a preventative risk management strategy that can help meet targets or recover from GHG reduction efforts that do not meet expected targets.

Success will depend on political will and confidence in the principles and standards.

Market Mechanisms

Renewable Energy Credits (REC) or Carbon Credits (CC) are traditional options to offset carbon providing they meet specific standards and therein lies the challenge: What is an acceptable standard and which organization will approve the standard?

Organizations are stepping in to help explain and provide better understanding of the issues, such as McKinsey: Internal Carbon Pricing
https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/the-state-of-internal-carbon-pricing

In the meantime, there is a growing number of other options being developed to reduce carbon. Traditional utility suppliers and entrepreneurs are stepping up to the challenge with creative solutions. The following is a brief discussion of a few of these options, starting with the more traditional. Other market mechanisms are quickly being proposed, such as green heat, green natural gas, renewable nuclear power (proposed by Bruce Power), etc.

Renewable Energy Credits (REC)

Perhaps the most recognized source of REC is from Bullfrog Power™
https://bullfrogpower.com/sustainability-solutions/
Founded in 2005, Bull Frog Power quickly became a visible means to demonstrate a green commitment by purchasing renewable energy. The concept was clear: pay a premium for the electricity purchased and that money would be used to install renewable energy on the grid. Therefore, the electricity used would be offset by the equivalent renewable energy. In 2018, SPARK power acquired Bullfrog Power and several more options were introduced:

* Green Energy
  i) Green Electricity
  ii) Green Natural Gas
  iii) Green Fuel
* Power Purchase Agreements (PPA), refer to their PPA:
  https://bullfrogpower.com/sustainability-solutions/power-purchase-agreements/
  REC and variations of the above, such as Virtual Power Purchase Agreements (VPPA) are developing as the market expands.

Green Heat and Renewable Natural Gas

Enwave is an example of introducing new solutions and building on their reputation and experience with Deep Lake Cooling and district systems:
https://www.enwave.com/geocommunities.htm
District hot water heating is comparable to many European centers where district hot water heating is common place. The challenge remains the source of heat.

Enbridge is also introducing new solutions:
https://www.enbridge.com/stories/2022/september/pilot-project-will-power-enbridge-gas-technology-operations-centre-with-hydrogen

Renewable Natural Gas (RNG):
https://www.enbridgegas.com/sustainability/clean-heating/renewable-natural-gas

The following was provided by Enbridge:

"At a high level, there is a technically viable path today for Enbridge Gas customers to apply RNG for these ends. It would require a customer to utilize our *direct purchase service* in the same way customers use it today – facilitating the allocation of 3rd party supply to the Enbridge distribution service to that billed premises. Note – you would be best served by having in hand some notion of:

i) RNG volumes,
ii) when you require it,
iii) for how long and
iv) a range of acceptable prices pr GJ
(RNG has a many origin, environmental attributes and related price points)"

Enbridge has submitted a request to the OEB that will allow Enbridge to develop Renewable Natural Gas (RNG) and keep up with other North American jurisdictions. The intent is to allow customers that purchase over 50,000 M^3 to purchase RNG, estimated at 1% in 2025 and up to 4% in 2028.

Governments are also responding with providing funding and supporting services, e.g.;
US Department of Energy: Alternative Fuels Data Center
RNG Standard: **https://afdc.energy.gov/laws/RFS**

Greenwash/Green Sheen

There remains considerable skepticism on market mechanism and many organizations are stepping up to ensure that commitments are real and can be verified by a reputable 3rd party.

Greenwash accusations are a serious threat to business, either real or perceived to be real.

For example, early in 2022, the Deutsche Bank was investigating for ESG greenwashing claims:
https://fortune.com/2022/05/31/deutsche-bank-dws-esg-greenwashing-raid-evidence-seized-whistleblower-fixler

In the US, the Security Exchange Commission (SEC) announcement:
SEC Proposes to Enhance Disclosures by Certain Investment Advisers and Investment Companies About ESG Investment Practices, i.e.:
"SEC Chair Gary Gensler. "ESG encompasses a wide variety of investments and strategies. I think investors should be able to drill down to see what's under the hood of these strategies. This gets to the heart of the SEC's mission to protect investors, allowing them to allocate their capital efficiently and meet their needs."
https://www.sec.gov/news/press-release/2022-92

Closer to home,
The Government of Canada established the Competition Bureau to review and respond to greenwashing and in January 2025, introduced Bill C-59 to protect against greenwashing,

An additional issue referred to as 'Green Sheen' or the appearance of being green that is difficult to proof.

Therefore, net zero solutions that use Market Mechanism require careful selection, implementation, and accompaniment by third-party verification to meet the high expectations of an ever-increasingly suspicious market.

Bottom Line:
The choice of market mechanism in a voluntary market is based on the parameters for the specific needs and intent of the purchase, which are yet to be defined.

CaGBC Net Zero, City of Toronto, Canada Infrastructure Bank and others are developing the standards and regulations for reporting as well as funding opportunities. When MM are fully developed and accepted by the market, they will become an inflection point.

The selection of the right mix of MM will also include other considerations, such as:
* Geographic area, aka, think globally and act locally.
(A 'buy local' strategy is often more appealing to stakeholders than foreign purchases.)
* Project type or technology application.
* Achieving other societal benefits.
* Enhancing support for other corporate ESG objective

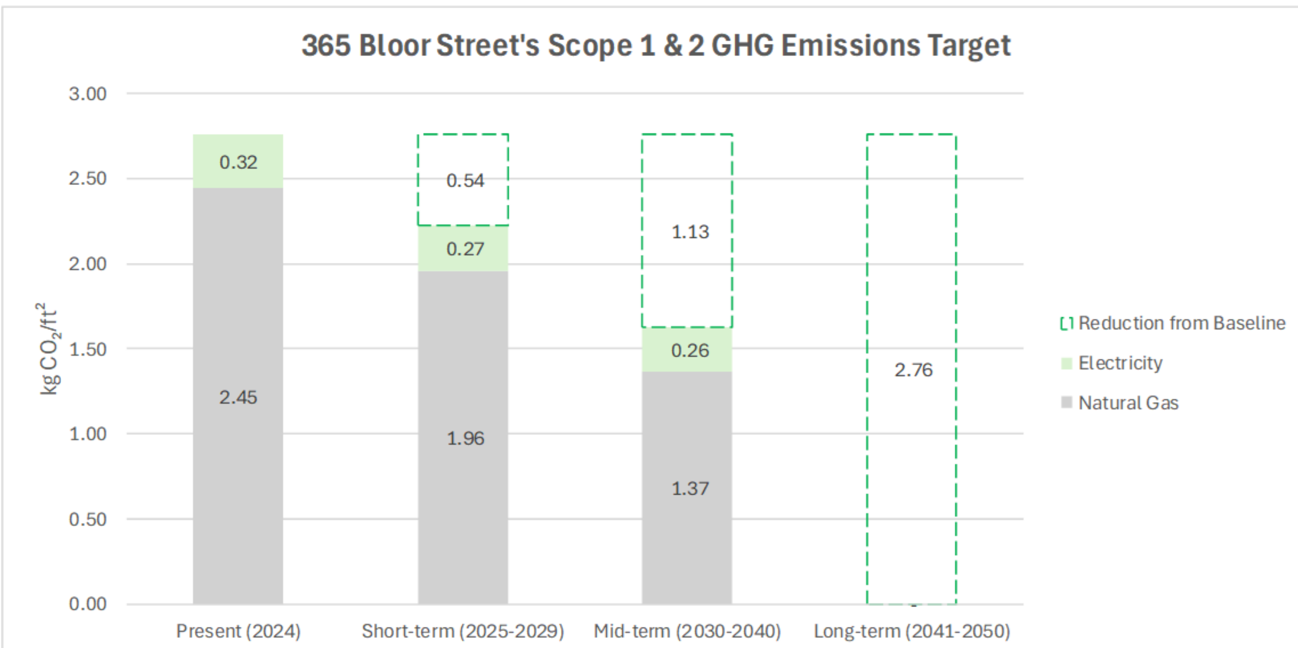
Therefore, the choice of market mechanism requires a **<u>sound strategy</u>** that can defend against greenwash/ green sheen accusations and benefit the business. Hence, the market mechanism (MM) net zero option is deferred to long-term once other options have been exhausted, and MM has matured and has market acceptance.

6.0 CONCLUSION

A climate response is essential and requires collective participation from everyone.

Companies are responding by developing ESG objectives that include decarbonization and with aggressive targets. Net Zero by 2050 remains the target for the federal government with the City of Toronto targeting Net Zero by 2040.

365 Bloor is targeting the following:



2025-07-29 365 Bloor GHG Baseline_Target (Energy@Work) R6

G:\.shortcut-targets-by-id\1MBPg5TTNSuR28p1celnatDADAVHyz1b0\EnergyShare\1.0 E@W Clients\365 Bloor - Greenrock\Decarbonization Report 2025\Emission Reductions

The strategy adhered to these principles for short, medium, and long-term implementation.

1) Accurate Data and Verified GHG Reductions: Must be believed
2) Firm but flexible: Change is inevitable, inflection points unpredictable and ability to pivot essential.
3) Process vs a destination: Important to have confidence in taking each next step.

A review of available information from government, advice from the private sector and from our experience, was incorporated into the Decarbonization plan to develop a continuous improvement approach.

As new information becomes available, the team can be informed and make necessary decisions by being proactively engaged and confident in taking each next step.

7.0 RECOMMENDATIONS

These recommendations support the success of the decarbonization roadmap.

7.1 Maintain Active Advocacy Efforts
Ontario's electricity and natural gas conservation efforts are driven by political commitments through electricity Demand Side Management (eDSM) that was announced in January 2025 and Demand Side Management (DSM) programs from Enbridge.

Efforts from BOMA Toronto and others have been able to influence programs.

It is recommended to participate with BOMA and other trade associations, so the voice of the commercial ratepayer is heard.

7.2 Include Refrigerant Emission Contributions with the suggested method of recording and reporting
CaGBC Zero Carbon Standard Workbook requires refrigerant emissions to be reported. The process will require a detailed review of current practices and a documented process to track emissions.

It is recommended to set up a formal reporting system for refrigerator emissions.

7.3 Investigate the purchase carbon credits as well as explore additional Market Mechanism (MM)
Market mechanism will continue to evolve and expect to gain acceptance as the standards and regulations are put in place to protect the integrity of the investment. The practicality of MMs is fundamental since it is more cost effective for some options over others; however, there are currently too many examples of fraudulent practices to secure consumer confidence.

It is recommended to establish a formalized MM strategy.

7.4 Maintain a continuous outreach and engagement strategy for staff and tenants
Dynamic changes are underway and the ability to sit and wait is no longer an option.

It is recommended to set up a formal system to engage staff and other stakeholders to report on ESG and Net Zero activities.

APPENDIX A: POST MEDIA WEBSITE & OPSAVER RESULTS

A.1 OPSaver: Postmedia Place Green Initiatives

"This program was introduced by Toronto Hydro in 2017 and runs for 4 years to 2021, allowing us to establish an electricity baseline and receive an incentive for every kWh we save once we register with the Program. Year one cost of the OPSaver Program is at no cost to us.
With the help of our Energy Management Consultants – Energy@Work Inc. to date, we have completed an ASHRAE Level 2 audit, identified fourteen energy-efficiency measures (EEM) – most of which have been implemented, registered with the OPSaver Program (May 2018), installed real-time monitoring on the main Toronto hydrometer, and host monthly energy management and OPSaver meetings to track and monitor our performance – something we also plan to do for natural gas.
With the EEMs we have implemented so far (since 2015), have reduced our overall energy consumption by 6%. We plan to continue improving our buildings' performance, carrying out continuous improvements that meet the stringent requirements set out by OPSaver. This will provide additional benefits to our tenants by tackling ever-rising energy costs."

A.2 OPSaver Results: 14.5% Reduction and Over $100,000 Saved

365 Bloor Street East Energy Management Action Plan (E-MAP) VERIFIED Results

Team: **Justin Taylor**
Alaric Da Cunha
Tim Douglas
Dan McCarthy
Fred Roper

Start Date	End Date	Days	kW	kWh	Verified Savings kWh	Avoided Costs $$	Incentive Paid $$	Comments	Milestones Payment
01-Apr-17	31-Mar-18		NA	4,144,056				Approved M&V Plan	
01-Jun-18	31-May-19	364			142,668	$ 21,400	$ 3,567	Verified Savings	$ 7,252
01-Jun-19	31-May-20	365			461,738	$ 69,261	$ 11,543	Verified Savings	$ 7,252
01-Jun-20	06-Dec-20	188			141,790	$ 21,269	$ 3,545	OPSaver ended	
				Savings	**603,528**	**$ 90,529**	**$ 15,088**		
							$ 105,617	Total for the period	$ 14,504

Notes:

Avoided cost is the electricity NOT used @	$0.15 per kWh	
Incentive paid by THES for verified electricity savings @	$0.025 per kWh	
Electricity savings are equal to the electricity used by an average Ontario household of:	8,900 kWh/yr	68 Homes

erified Project Summary:

UILDING SITE INFORMATION:

ary Building Name: 365 Bloor St E
ress: 365 Bloor St E
: Toronto Province: Ontario Postal Code: M4W 3L4

ROJECT EVALUATION

ar	Building	Period		Baseline		Estimated Savings		Actual Savings		Performance Incentive ($)
		Start Date	End Date	Demand (kW)	Energy (kWh)	Demand (kW)	Energy (kWh)	Demand (kW)	Energy (kWh)	
MP	365 Bloor St E	4/1/2017	3/31/2018	N/A	4,144,056	N/A	N/A	N/A	N/A	N/A
1	365 Bloor St E	6/1/2018	5/31/2019	N/A	N/A	N/A	635,605	Not Provided	142,668	$3,567
2	365 Bloor St E	6/1/2019	5/31/2020	N/A	N/A	N/A	635,605	Not Provided	461,738	$11,543
3	365 Bloor St E	6/1/2020	12/31/2020	N/A	N/A	N/A	372,656	Not Provided	141,790	$3,545
ss Totals for Year 2:									461,738	$11,543
ss Totals for Final Prorated Year:									141,790	$3,545
formance incentive for Year 2:										$11,543

d Comment? **Contact Energy@Work, 416 402-0525** Requests@Energy-Efficiency.com

55 Bloor St. E E-MAP Verified Results (Energy@Work)
argets-by-id\1MBPg5TTNSuR28p1celnatDADAVHyz1b0\EnergyShare\1.0 E@W Clients\365 Bloor - Greenrock\2018-2020 OPSaver Results

APPENDIX B: EXAMPLES OF NET ZERO OPTIONS

1. Net Zero Preperation

ID	Preperation Measure	Comment	Priority	Time Frame	Investment	Budget ($)
1.1	Calibrted eQuest Model to analyze GHG reduction measures	Very valuable	High	2023	Modest	$ 20,000
1.2	Real Time Monitoring					
1.2.1	Enbridge Natural Gas Meter	Very valuable	High	2023	Modest	$ 5,000
1.2.2	Enwave Chilled Water	Useful	Low	2025	Modest	$ 15,000
1.3	IR and thermal scanning	Every 3 years	Low	2026	Modest	$ 40,000
1.4	Testing Adjusting Balancing (TAB)	Re-verification	Midium	2023	mid	$20,000-$80,000
1.5	Electric power supply review and approval	Need for electric boiler	Low	2025	Modest	$ 20,000

2. Demand/Consumption Reduction Measures:

ID	Green House Reduction Measures	Improvement Type (Demand/Generation)	Practical	Time frame	Investment level	Budget ($)
2.1	Tenant engagement	Demand	Yes	Short term to long term	low	$ 10,000
2.2	Envelope improvement (re-caulking)	Demand	Yes	short term	mid	$ 40,000
2.3	Existing Building Commissioning (EBCx)	Demand	Yes	short-mid term	mid	$ 120,000
2.4	Heat Recovery Ventilator (HRV)	Demand/Generation	Yes- implemented on air already	Mid-term to Long term	mid	TBD
2.4.1	Air Heat Recovery improvement (Heat wheel optimization)	Demand/Generation	Yes	short-mid term	low	$ 16,000
2.5	Existing Heating System improvements (BAS control and Cx measures)	Demand/Generation	Yes	Mid-term to Long term	mid	$ 500,000
2.5.1	Full LED retrofit (55% reduction in lighting power density)	No impact for 1Y	Yes	Mid-term to Long term	high	$ 500,000
2.5.2	Occupancy, Vacancy and daylight control	Demand	Yes	Mid-term to Long term	Mid	$ 100,000
2.5.3	Low flow water fixture	No impact for 1Y	Yes	Mid-term to Long term	high	$ 850,000
2.6	Windows replacement	Demand	Cost prohibitive	long-term	high	**$ 12,000,000**
2.6.1	Double Glazed, low e (U-0.36,SHGC 0.32)	Demand	Cost prohibitive	long-term	high	
2.6.2	Triple glazed, low-e windows (U-0.22,SHGC 0.32), refer to Mohawk College	Demand	Cost prohibitive	long-term	high	
2.6.3	Electrochromic glass, double glazed (U-0.36,SHGC 0.16-0.52)	Demand	Cost prohibitive	long-term	high	
2.6.4	PV Window Panels, refer to Seneca example	Demand	Cost prohibitive	long-term	high	
2.7	Envelope Improvements	Demand	Cost prohibitive	long-term	high	$ 15,000,000
2.7.1	Roof insulations	Demand	NO	long-term	high	
2.7.2	Spandral	Demand	Cost prohibitive	long-term	high	
2.8.	Time Independent Energy Recovery (including thermal Storage)	Demand/Generation	space and weight limitation	long-term	high	TBD

3. Generation improvement, technology change, and fuel switching measures

ID	Green House Reduction Measures	Improvement Type (Demand/Generation)	Practical	Time frame	Investment level	Budget ($)
3.1	Electric boilers	Generation	Yes	Mid-long term	High	$1,000,000
3.1.1	Electric boiler backed with WSHP	Generation	Yes	Mid-long term	mid-high	$267,000+$350,000
3.1.2	Electric boilers with heat recovery chiller	Generation	No- Enwave CHW contract	NA	High	$12,000,000
3.2	Enwave hot water option	Generation	Not now- high emission factor	Mid-long term	TBD	NA
3.2.1	Air source heat pump (ASHP) for domestic hot water heater	Generation	Not practical	Mid-long term	High	NA
3.3	Hybrid Heating plant (Electric + gas boilers)	Generation	Yes /adding 2.2 to existing plant	Mid-long term	mid-high	$350,000
3.4	Water Source HP	Generation	Yes	Mid-long term	High	$267,000+$267,000
3.5	Central Heat Pump for MAU	Generation	No- limited heating demand	long term	High	NA
3.6	Thermal Solar Panel	Generation	No - Limited demand	Long term	High	NA
3.7	Solar PV (roof)	Generation	Already implemenetd	long term	Mid-high	NA
3.8	Ground source HP	Generation	No-Enwave CHW use mandate	long term	High	$ 240,000
3.9	Low temperature water distribution	Generation	Cost prohibitive	long term	High	NA
3.9.1	Free Cooling from water economizer chiller and cooling tower	Generation	No- Enwave CHW contract	NA	High	
3.9.2	Chilled water (CHW) from Enwave deep lake water cooling	Generation	Already implemenetd	long term	Mid-high	
3.10.	Convert gas humidifier to electric	Generation	Yes	Mid-long term	Mid	
3.11.	PV windows	Demand/Generation	Not available	Long term	High	
3.11.1	Transparent PV Windows					
3.11.2	PV Window Film					
3.12	Carbon Capture Technology	emission avoidance	May be	Long term	Mid- high	
3.13	Market Mechanism					
3.13.1	Carbon Credits (CC)					
3.13.2	Green Heat, refer to enwave					
3.13.3	Power Purchase Agreements (PPA) and Virtual PPA					
3.13.4	Renewable Natural Gas (RNG) refer to Enbridge					
3.13.5	Renewable Energy Credits (ERC)					

Comments:

C.1 To review annually

C.2 Criteria to evaluate measures

1. Initial cost
2. On-going cost: Energy and Maintenance
3. Interruption during retrofit
4. Infrastructure (electrical and construction) limitation
5. Life expectancy of the existing equipment and timeline
6. Economic life of the new equipment and options
7. Reliability and resiliency, i.e, the technology must be commercially available

APPENDIX C: TORONTO HYDRO'S HEATING LOAD ESTIMATOR V1.0

The energy audit for 365 Bloor Street's was reviewed and included the heating system with the help and support of the operation team.

The natural gas boilers in the penthouse were designed to provide high temperature heat for distribution through end use devices. Alternate technologies, such as heat pumps, provide low temperature heat. Electric boilers are available to provide high temperature; however, the replacement cost, as well as concerns with Toronto Hydro distribution and supply capabilities, makes a simple 1-for-1 replacement impractical.

Therefore, Toronto Hydro's Heating Load Estimator v1.0 was used for 365 Bloor St East to estimate the potential demand (kW) increase needed for various technologies, refer to table below:

Estimated electrical peak increase at 365 Bloor Street E
for Electrification of Space Heating (excluding non-weather thermal uses)

Space heating electrification technology	Heating Equipment COP at -23°C	Input kW at -23°C	Heating Electrification Delta (kW)	Possible maximum peak increase (kW)
Electric resistance or electric boiler	**1.0**	**2300 ± 300**	217	**2000 ± 300**
Air source heat pump (low efficiency)	1.2	1900 ± 200	217	1700 ± 200
Air source heat pump (mid efficiency)	1.9	1190 ± 130	217	970 ± 130
Air source heat pump (high efficiency)	2.2	1030 ± 120	217	810 ± 120
Ground-source heat pump	3.8	590 ± 70	217	380 ± 70
COP for electrified heating ≤ summer peak*	**10.4**	220 ± 20	217	0
Custom COP (User's choice)	1.7	1330 ± 150	217	**1110 ± 150**

Reference: *2025 THES Heating Load Estimator v1.0 (365 Bloor St E)*

Identifying heating electrification technologies with an accurate assessment of future technologies leads to better mid- to long-term capital investment decisions and minimizes the need to purchase market mechanisms to offset the remaining GHG emissions.

When the time is right to assess these options, Toronto Hydro Climate Action team can:

• Upon request, Toronto Hydro will provide customers with a service connection assessment prior to formal initiation of the Offer to Connect process.

• Assessments account for a customer's needs by providing information on proposed load interconnections/scenarios feasible at the time of the request

• Assessments consider a potential customer's needs by providing information on proposed load interconnections/scenarios feasible at the time of the request.
For detailed information, refer to: ClimateAction@TorontoHydro.com

APPENDIX D: NET ZERO EXISTING BUILDINGS STRATEGY

The City of Toronto's
Net Zero Existing Buildings Strategy

Final Report
March 2021

City of Toronto's Net Zero Existing Buildings Strategy, March 2021

Table 1: Cluster 12 Input Parameters - 1st and 3rd Quartile Values

Example Summary of Appendix Information (Cluster 12 - MURB circa 1990, 5,000 - 20,000 m²)					
Energy System Group	**Calibrated Parameter**	**Range of effective performance**		**Examplar System**	**Typical Service Life (years)**
		Q1	**Q3**		
Enclosure	Window to Wall Ratio	60%	25% building	Generally punched windows with some curtain-wall	–
	Window R-value	1.1	1.7	Double glazed, air-filled IGU with aluminum frames	25-35
	Wall R-value	2.3	9.7	1-2" of board insulation or batt insulation to interior	25-50
	Roof R-value	4.5	9.7	1-2" of mostly continuous, rigid insulation	25-30
Ventilation Systems	Ventilation Heat Recovery	38%	60%	Central pressurized cooridors with suit-level exhaust. No heat recovery assumed in base case.	15-20
Heat/ Cool Systems	Delivery system	See discussion		4-pipe fan-coil system with constant volume pumps and fans	20-30**
	Cooling COP	2	2	Central centrifugal or scroll chiller with cooling towers on roof	20-30
	Heating COP	0.70	0.93	Central, standard efficiency gas-tired boiler	20-30
User-driven Energy Use	DHW flow rates & appliances	See discussion		Typically upgraded fixtures & appliances, but to older standards	10-15
	Plugs & Lighting	15 W/m²		Some facilities have undergone lighting upgrades***	10-20

* *Heat recovery is not very common in MURBs that fit into Cluster 12, however, it is common to turn off ventilation systems, mimicking the effects of heat recovery.*
** *Active equipment (e.g. fans and pumps) losts 15-20 years, but ductwork and pipes can last 40-60 years*
*** *See discussion in the next section (i.e. 2.3) about occupant-driven energy and its importance to achieving cost-effective emissions reductions.*

This information helps to identify what, when and how systems may be upgraded or replaced over the next several decades. While these opportunities will be crucial for the achievement of significant emissions reductions, it is important to note here that MURB and larger commercial building capital plans tend to focus primarily on minimizing lifecycle costs of system maintenance, and not on emissions reductions. Longer term capital planning and regular maintenance is not at all common in smaller commercial buildings or single-family homes, meaning that replacement often takes the form of emergency "like-for-like" or only slight improvements in efficiency. In all building types, investment in large capital expenditures such as recladding or major HVAC upgrades is typically avoided unless absolutely necessary and occur at a small number of major milestones throughout the building's overall service life (i.e. at 15 to 40-year intervals, depending on the facility and sub-systems in question).

Meaningful integration of GHG reduction measures into capital planning is therefore a challenging but critical feature of successful decarbonization projects, in order to maximize synergies, reduce disruption, and lower the cost of upgrades to building owners, operators and occupants.

https://www.toronto.ca/wp-content/uploads/2021/10/907c-Net-Zero-Existing-Buildings-Strategy-2021.pdf

APPENDIX E: EXAMPLE OF A CARBON CREDIT (CC) PURCHASE

An example of the cost of purchasing carbon credits is provided in the following 2022 invoice.

The cost of carbon predicted to increase significantly and for the purposes of the decarbonization plan, the price of carbon was estimated at $283/Tonne Vs the $8.1968884 in this 2022 invoice:

ACTIVITY	QTY	RATE	AMOUNT
Carbon Credits	239	8.1968884	1,959.06

Notes:

1.0 The quantity of 239 is US Metric Tonnes.

2.0 The carbon credit is low and was used to meet the requirements of certification, i.e., BOMA and LEED

3.0 Carbon Credits purchased are Green-e Climate certified (VCS standard) and comply with the current BOMA BEST, LEED and CAGBC standards.

4.0 CC or other market mechanism can be considered as a final solution after operational and capital measures are exhausted.

5.0 The use of CC was used for the long term in 2049 to achieve Net Zero.

APPENDIX F: BOMA BEST V4.1 REQUESTS

The following Requirements were specifically requested to be addressed in response to BOMA BEST Building Certification Version 4.1. The requirement is provided as well as the response in GREEN.

E2.1a Net Zero Transition Plan: E2.1a — Net Zero Transition Plan - BOMA Field Guide - English
Is there a Net-Zero Transition Plan or Decarbonization Roadmap with specific carbon reduction targets?
Response: Yes

Questions: If it will be implemented (if not, explain why)

Work is underway, refer to:
2025-05-24 365 Bloor Decarbonization Roadmap (Energy@Work) R0

a. The associated budget
   Annual budgets are prepared and approved with associated savings, etc.
   Refer to the roadmap for activities thus far.
   (implementation cost, savings, cost of carbon abatement ($/t$CO_2$e lifetime, incentives, etc.)

b. An overview of the metrics to be used to measure progress
   Scope 1 and Scope 2 are tracked monthly and reported with management and operations to measure progress. A Measurement and Verification (M&V) Plan using IPMVP Option C and prepared by a PMVA is in place and used to measure progress.

c. A timeline for completion (one-year, five-year and 10-year)
   A short term, mid-term and long term completion schedule with specific targets defines the timeline to align with the Canadian target of 2050:
   https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/net-zero-emissions-2050.html

d. The person responsible for implementation
   Alaric daCunha (adacunha@365bloor.com 416 471 2671)

Documentation: 2025-05-24 365 Bloor Decarbonization Roadmap (Energy@Work) R0
Location:
G:\.shortcut-targets-by-id\1MBPg5TTNSuR28p1celnatDADAVHyz1b0\EnergyShare\1.0 E@W Clients\365 Bloor - Greenrock\Decarbonization Report 2025

- E2.1b Net Zero Transition Target: [E2.1b — Net Zero Transition Target - BOMA Field Guide - English]

  Does your organization have a net zero carbon reduction target? YES
  The timeline for completion is aligned with the Canadian target of 2050 and has been signed by senior manager with annual reviews:
  https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/net-zero-emissions-2050.html

  The net-zero reduction target can be established to encompass either all utilities as a whole or divided into each type (electricity, gas etc.) of utility under the owner or landlord's control.
  Electricity and Natural Gas are used as a whole

Documentation
Refer to:
1) Report: *2025-05-24 365 Bloor Decarbonization Roadmap (Energy@Work) R*0

2) Letter date July 28th, 2025 from: Alaric daCunha (adacunha@365bloor.com 416 471 2671)

- E3.3 Third Party Recognition: [E3.3 – Third-Party Recognition - BOMA Field Guide - English]
  Has the building's energy use or carbon emissions been certified by, reported to, or recognized by a third-party? YES
  Energy@Work has been reporting building energy use and carbon emissions for over 20 years and use Efficiency Valuation Organization (EVO) IPMVP which is considered and international standard as well as the use of NRCan RETScreen®. Toronto Hydro and the Independent Electricity System Operator have reviewed and approved this approach, refer to Appendix A.

These apply:

Energy Star Certification or equivalent achieved = 1 point
GHGs reported to third-party = 1 point:
IPMVP OPTION C is used to report results to utilities:
i) the IESO for electricity reductions and
ii) Enbridge for Natural Gas.

APPENDIX G: TIME-INDEPENDENT ENERGY RECOVERY (TIER)

TIER refers to a specific type of thermal energy storage (TES) that combines energy recovery and thermal storage to improve energy efficiency, reduce costs, and optimize system performance in large buildings.

Key Features of TIER Systems:
a) **Energy Storage and Recovery:**
TIER systems integrate thermal storage and energy recovery to manage heating and cooling loads more efficiently, particularly in large commercial and mixed-use buildings. By combining these elements, TIER can provide heat or cooling at times when demand peaks and during periods of low demand.

b) Thermal Energy Storage (TES):
TIER systems use thermal energy storage technologies, such as hot water tanks or condenser water tanks, to store energy that can later be used for heating or cooling. These systems store energy during low-demand periods and then discharge it when heating or cooling needs increase.

Multi-Mode Operation:
TIER systems are designed to operate in multiple modes depending on the energy needs of the building. For example, during colder months, energy stored in the system can be used for heating, while in warmer months, it can provide cooling. This flexibility allows buildings to meet year-round heating and cooling requirements without the need for large, expensive, and inefficient HVAC systems.

Efficiency:
The key advantage of a TIER system is its energy efficiency. By using thermal energy storage, the system can capture waste heat from the building (e.g., from cooling systems) and use it for heating when needed, thereby reducing the need for additional energy inputs. The result is lower overall energy consumption and reduced reliance on grid electricity, which is often generated from fossil fuels.

Cost-Effectiveness:
TIER systems can be more cost-effective than traditional heating and cooling systems because they reduce the need for multiple units to operate simultaneously. By using stored thermal energy and improving system efficiency, these systems lower operating costs and reduce the size and complexity of HVAC equipment.

How TIER Works:
Step 1: Heat recovery chillers and air-source heat pumps (ASHPs) are used to recover waste heat from the building.

Step 2: This recovered energy is stored in a thermal energy storage (TES) tank (hot water or condenser water), which is based on the building's needs.

Step 3: The stored energy is then used for heating or cooling the building as needed. During high-demand periods, stored energy is discharged to meet the building's heating or cooling load.

Step 4: If necessary, a trim heat source (such as an ASHP) is used to supplement energy storage and provide additional heating.

Applications for TIER Systems:
Large commercial and mixed-use buildings have significant heating and cooling demands.

District energy systems where multiple buildings are connected and can share stored thermal energy.

Retrofitting existing buildings to improve energy efficiency and reduce operational costs without a full overhaul of the heating and cooling systems.

Advantages of TIER Systems:
Improved Energy Efficiency: By reusing waste heat and optimizing storage and retrieval, TIER systems can significantly improve the energy efficiency of large buildings.

Space and Cost Savings: Since TIER systems reduce the need for large-scale cooling or heating systems, they can save valuable space and reduce installation and operational costs.

Flexibility: TIER systems can provide both heating and cooling, making them highly adaptable to varying seasonal and operational demands.

Environmental Benefits: By reducing reliance on fossil fuels for heating and cooling, TIER systems can contribute to a building's efforts to reduce carbon emissions and achieve net-zero targets.

Challenges:
High Initial Costs: While TIER systems offer long-term savings, the initial installation costs can be higher than traditional HVAC systems.
Space Requirements: Depending on the system design, large thermal storage tanks may require significant space, which could be a constraint in certain buildings.
Complexity: Integrating TIER systems with existing building systems may require additional planning and expertise.

TIER Summary:

TIER systems are an advanced approach to improving the energy efficiency of heating and cooling in large buildings. By combining thermal energy storage with energy recovery, TIER systems can reduce costs, improve efficiency, and help buildings meet their decarbonization targets. However, their adoption requires careful planning, space considerations, and understanding of building-specific needs after right sizing system requirements and completing short-term cost-effective measures.

APPENDIX H: 365 BLOOR BUILDING AND SYSTEM DESCRIPTION

Refer to File:

2025-07-27 365 Bloor Building Description (Energy@Work) word R3

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365 Bloor General Facility Overview

365 Bloor is a 20-storey office tower and retail complex and built in 1972 with a major expansion in 1977. Additional renovations took place in 2013 for National Post Head office relocation.

This report is dedicated to the office tower portion of the complex and excludes the ground floor retail section as well as the basement levels located outside the office tower footprint. There are 3 basement levels in the office tower. The Gross Floor Area (GLA) for this portion is 346,788 ft2, as provided by Greenrock. This floor area includes the 3 below-ground levels of mostly storage areas.

At the time of the report, the average day had 598 tenants, which worked out as 49.1%, and 86 guests per hour working out to 28.5%. Or 45.5 % overall. The hybrid 'work from home' model is expected to continue. The above ground levels are for office tenants.

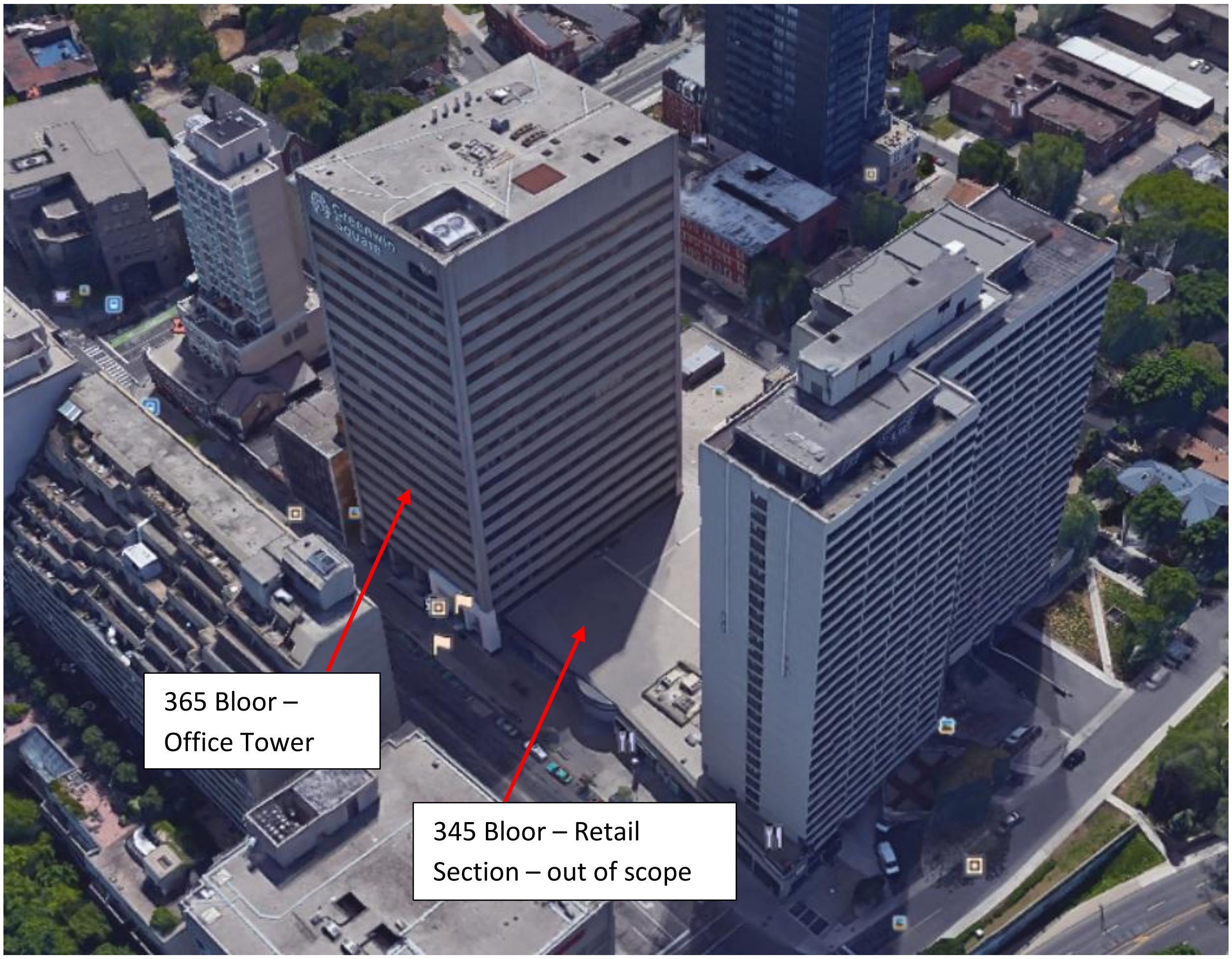
The May 2025 stacking plan was provided with an estimate of occupants based on the respective tenants. Security is on site 24*7. With a concierge in the lobby M-F from 6:30 am to 4:30 pm. 2 operators are on site 5 days a week. The first starts at 7:00 am to 3:30 pm with the second starting at 10:00 am to 6:30 pm. The management office is open M-F from 8 am to 4 pm.

The ground floor serves as the main lobby with a small coffee shop. The mechanical penthouse occupies the top floor, and the BAS is In the operator office.

Typical hours of occupation are:
Monday to Friday 8:00 a.m. to 6:00 p.m.,
There is limited weekend or holiday occupation.
The PostMedia floors have changed over the years with the 3rd and 4th sublets and are fully occupied. 5th was a different tenant who has vacated the building. Postmedia floors running on low occupancy are 6th, 11th and 12th.

Energy@Work performed a site inspection of the building on June 16th, 2025. The following discussion represents the observations and findings from this onsite visit

Overview of 365 Bloor



Property Operations

There are two full-time operators on site looking after the facility. They respond and deal with tenant calls, and look after day-to-day building operation. Some scheduled maintenance on the mechanical systems is done by outside contractors.

As part of the property's Energy Management Action Plan (E-MAP), monthly meetings are conducted with Energy@Work. The purpose of these meetings is to review the property's utility performance with operators. In addition, the E-MAP includes meetings with the management team to review EEMs, CDM/DSM, operational issues, capital plan, etc. Monthly and annual reports are also provided to senior management.

The building operatoring team is proactive with regard to energy efficiency and energy management, keeping a close eye on possible opportunities and also on changes to the building's energy performance. This helps explain the good performancre of the building.

Main Retrofits in the Building

Only a few projects aimed at improving the energy performance of the building have been completed in the last 5 years, including:

- Retrofit garage lighting to LED (2023)
- Repaired mall revolving doors (2023)
- Retrofit mall corridor lights to LED (2022/23)
- Replace 2nd floor fan coil units (2022/23)
- Installed new bi-polar ionizer filtration system on tower AHUs (2021)
- Installed air curtains at front and rear retail entrances (2022)

Mechanical Systems Overview

The majority of the building's HVAC equipment is original (1972-1977). The building HVAC is based on three air handlers' servings the 3rd to the 20th floor and 1 air handler dedicated to the 2nd floor also original (1972). Heating and cooling are provided using hydronic distributions loops served by a central plant with gas-fired heating boilers and a central chilled-water system. The zone controls for the mechanical systems are pneumatic. The central equipment is centralized and controlled by the BAS.

Heating system

A central heating plant is in the penthouse and the design is based on a primary/secondary loop configuration with 5 natural draft boilers shown in the following table:

Tag	Make	Model	Input MBH	Efficiency
B-1	LAARS	HH 3050	3050	82%
B-2	LAARS	HH 3050	3050	82%
B-3	LAARS	HH 3050	3050	82%
B-4	LAARS	HH 3050	3050	82%
B-5	LAARS	HH 3050	3050	82%
2nd Floor B-1	LAARS	HH 500	500	77%
2nd Floor B-2	LAARS	HH 500	500	77%

Penthouse Boilers at 365 Bloor

Note:
Despite the boilers 82% nominal thermal efficiency, the boilers will have a low annual efficiency due to the open stack present on atmospheric boilers. This allows the boiler heat exchanger to be continuously cooled by induced airflow even when the boiler is off.
The second floor is served by two separate boilers. These boilers are also atmospheric units. The boilers are on a primary-only loop. The loop serves the 2nd floor air handlers as well as perimeter radiation heating.

The penthouse secondary loop is dedicated to the perimeter induction units. The loop is a switch-over design providing chilled water in the summer and hot water in the winter. A set of two three-way valves are used to perform the switch over between the two modes of operation. The boiler primary loop also feeds the perimeter air handler heating coil through a plate-and-frame heat exchanger serving a glycol heating loop. A three-way mixing valve is used on the primary-side of the heat exchanger to modulate the capacity of the glycol loop.

The penthouse boilers are set to be replaced in the next 5 years. Condensing boilers and Heat Pumps are being considered after ensuring the system is 'right sized'. The operator indicated that at peak time, only two boilers were firing. This is an indication that the installed boiler capacity is well above the peak load requirements. This will be confirmed as part of the boiler replacement project to avoid oversizing the replacement equipment.

The penthouse boiler primary loop is reset based on outdoor temperature between 50 oC and 75 oC. The lower range of this reset schedule is below the dew point for natural gas and could result in condensation occurring in the boilers. The second-floor boiler is under review as part of the Enbridge Boiler Optimization Pilot with several options under review, such as a condensing unit or heat pump.

Both penthouse primary and secondary loops are constant flow. The penthouse boilers are also equipped with dedicated boiler pumps. The primary loop for the 2nd floor is also constant flow. A possible measure for the secondary loop is to convert it from constant flow to variable flow. The secondary loop is equipped with a central bypass. This bypass could be closed off and a VFD used to modulate the flow to maintain the pressure differential across the loop. This measure would bring savings both in heating mode and in cooling mode since the loop is a switch-over design.

Heating to the spaces is provided by perimeter induction units with radiation heating on the 2nd floor. Space temperature set points are manually adjusted within the induction units.

Primary Pumps (left), Secondary Pumps (right)

Circulating Pump for Boiler #1

Main Pumps List

Tag	Service	Flow (gpm)	Head (ft)	Motor (hp)
P-1	Chilled water	1400	60	40.0
P-2	Condenser water	2240	50	50.0
	Boiler Circulating Pumps (5 Nos.)			
P-3A/3B	Heating primary	320	44	7.5
P-4A/B	Secondary	450	72	15.0
P-5	Spray pump	200	50	5.0
P-6	DHW primary	20	20	0.3
	Domestic Booster (3x)	111.4	318.9	15

Cooling system

The building is cooled from a central chiller plant. Mechanical cooling is provided typically from May to October. During the shoulder and winter months, cooling is from air-side economizers on the AHUs.

The cooling system is based on a single Carrier variable speed centrifugal chiller. The chiller was installed in 2009 and is in good condition with a remaining service life of over 14 years with good maintenance. Based on the information provided by the operator, and corroborated by the RTM data, the chiller has more than enough capacity to meet the building's peak cooling load.

The chiller is piped in a primary/secondary loop configuration. The primary loop is constant flow served by a single pump. This loop serves the secondary induction loop as well as the three air handlers located in the penthouse. The secondary loop is the switch-over induction loop presented in the Heating section. The secondary loop also provides chilled water to the 2nd floor AHU.

Primary chilled water is supplied at a temperature varying from8 °C to 10 °C based on outdoor air temperature. Secondary chilled water to the induction coils is supplied from15 7°C to 16.9 °C based on outdoor temperature, therefore is basically constant.

Heat rejection from the chiller comes from two induced-draft cooling towers. The towers have variable speed drives for their fans. The towers operate from mid-May to mid-October and uses air-side free cooling for the other periods.

A review of the control setpoint for resetting based on wet-bulb temperature is a suggested measure for this system. Additionally, it was noted that the cooling towers operate in a lead-lag mode, which is suboptimal when using VFDs. This control sequence also requires review and could be addressed as part of a chiller plant recommissioning."

The chiller and cooling towers list are provided below.

Chiller List

Name	Make	Model	Capacity Tons	Power kW	Efficiency kW/Ton
CH-1	Carrier	19XRV	745	453	0.61

Cooling Towers List

Name	Make	Model	Fan HP
CT-1	BAC	S3E-8518-06L	15
CT-2	BAC	S3E-8518-06L	15

Office Chiller

Primary Chilled Water Loop Pump

Cooling Tower

Converting the primary and secondary pumps to variable flow is under consideration. The secondary pump measure was described for the heating system. The primary loop could be converted to variable flow even though there are limitations due to the minimum flow requirements for the chiller. However, since the chiller is a variable speed model and relatively recent, it is adaptable to primary variable flow. Also, a VFD on the condenser pump can be considered, but savings will be much more limited once the tower operation has been optimized (set points, sequence).

Air-handling systems

The building HVAC system consists of 4 built-up air handlers. The three main air handlers are in the mechanical penthouse. One unit is serving the perimeter zones from the 3rd to the 20th floor. This unit, Perimeter Supply Fan (AHU-1), is an induction unit. The induction unit is a switch-over system providing cooling in the summer and heating in the winter. AHU-1 has a heating coil, a cooling coil and a spray-coil humidifier.

The Building Operator confirmed that the humidifier has not been operating. The spray humidifier is located before the cooling coil and the biofilm that formed on the cooling coil while the humidifier was in operation remains. It is recommended to replace the humidifier after the cooling coil and before the heating coil.

The pressure drop across the cooling coil was within range. However, the temperature distribution was not uniform on the cooling coil. The bottom portion was about 4C higher than the top. It is recommended to clean the coil

The valve in the piping b/n the chilled water supply line to the coil and three-way DDC valve supposed to open in summer was found to be closed during the site visit. It is suggested to open the valve.

Spray coil humidifiers are often replaced with steam humidifiers due to the operational issues associated with the spray system, including the potential water treatment requirements. However, no energy benefits are associated with replacing the humidification system.
The cooling coil has a three-way mixing valve while the heating coil is served by a glycol loop. The loop is heated by the primary boiler loop and has a three-way mixing valve.
The supply fan was retrofitted with a VFD that only serves in derating the flow to 80% of its nominal value. This was done to avoid overloading the supply fan motor, based on the information obtained during the site visit.
The Perimeter and interior fans have MERV13 pleated and bag filters. The Building Operator mentioned that the pleated filter is typically replaced every 3 months, and the bag filter is replaced yearly. The pleated and bag filters were last replaced in March 2025 and June 2024, and they are due for replacement.

MERV 13 Pleated Filter (left), Bag Filter (Right) of Perimeter Supply Fan

The air temperature supply for this system is modulated based on the return temperature but on a very limited range, namely 19.5 ^{o}C to 22.5 ^{o}C. This unit will provide very little dehumidification in the summer with potential for condensation occurring at the induction units. The warm supply for the secondary loop in cooling mode is likely to minimize or eliminate this risk. However, this may result in higher relative humidity conditions in the spaces.

It is also important that the return air for this system is shared with the two interior units, as they utilize a common return fan. Consequently, the return temperature is not an accurate indicator of the actual cooling load for this specific system. Using return temperature as a control parameter is not recommended and should be replaced with the addition of several representative zone-level temperature sensors.

The Perimeter Fan has an air-side economizer. The outdoor air dampers have four sections. Three sections were closed and only used for free cooling. Only one section modulates to provide the minimum outdoor air. The minimum position for the outdoor air damper was 35%.

The unit runs 7 days with a weekday schedule 5.30 am to 9 pm, Saturday 7 am to 8 pm and Sunday 8 am to 7 pm.

Corrosion was observed on the heating coil of the Perimeter Supply Fan. This was not a build-up corrosion and appears to be transferred from somewhere else. The pressure loss across the heating coil was within range. However, it is recommended to clean the heating coil.

Heating Coil

Two units serve the core section of the building from the 3rd floor to the 20th floor. The two units are constant volume systems. Most of the floor-level reheat coils have been removed.

The second floor has a dedicated air handler, located on a 2nd floor mechanical room. This unit is a constant flow system.
The ground floor lobby is served by dedicated fan-coils for the two vestibules. One of the Mall air handling units, AHU-1, provides cooling and ventilation to the Office Tower lobby. Therefore, most of the HVAC load for this floor is under the mall electric utility meter.

Several impactful energy efficiency measures are under review and part of the right sizing exercise.

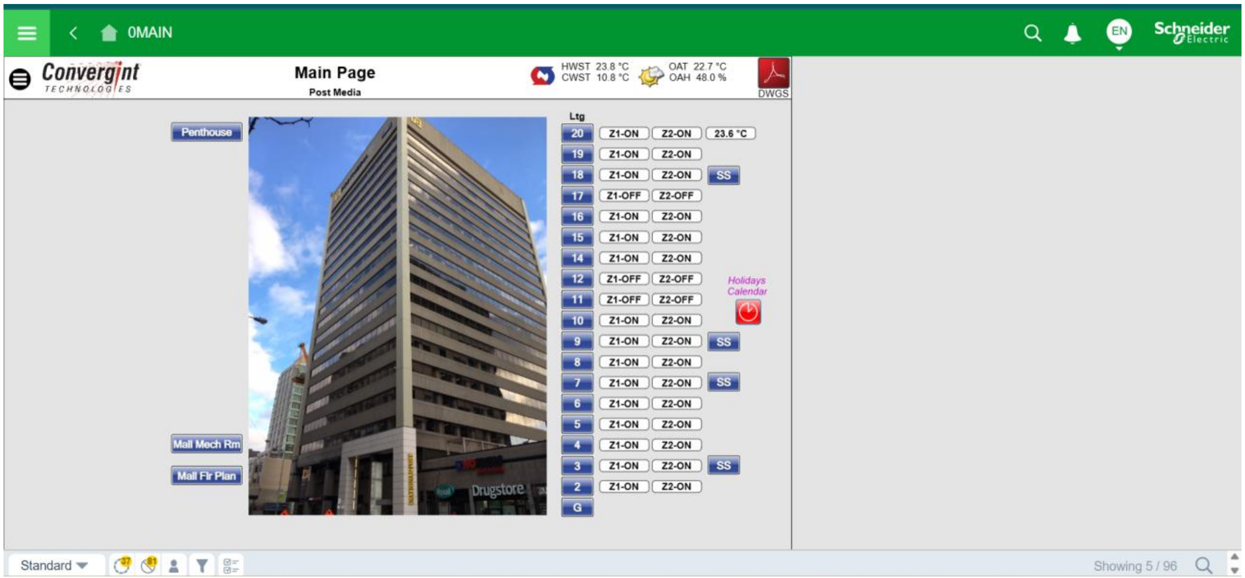
Building Automation System (BAS): Convergint Technologies

The BAS controls the central plant equipment, including the boilers, pumps, cooling towers and the chiller as well as the main air ventilation units and exhaust fans. The BAS also controls the lighting system, with typically 2 zones per floor.

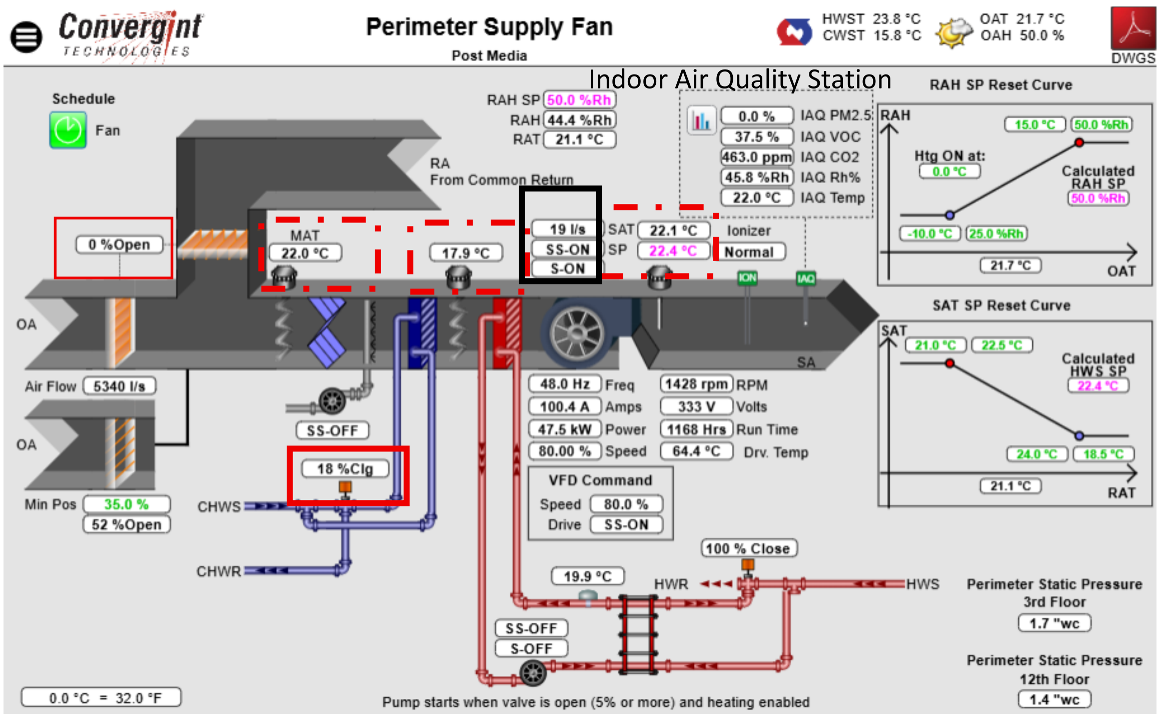
The BAS does not have control of the terminal equipment, such as the induction boxes, which are still on independent pneumatic control. This prevents implementing measures, such as resetting the induction unit flow based on demand or proper zone reset of the supply temperature of the constant flow core units. An upgrade to a full DDC system is a potential measure for this building but is a large capital measure with no payback based on energy savings alone.

A summary review of the BAS identified observations regarding optimization opportunities that are under review. Globally, the system implements a few significant energy savings measures, such as scheduling and reset of the hydronic loop temperatures. However, many of these measures offer additional savings through better optimization. Most of these measures fall into O&M measures that will be implemented through an Existing Building Recommissioning (EBCx) that is underway.

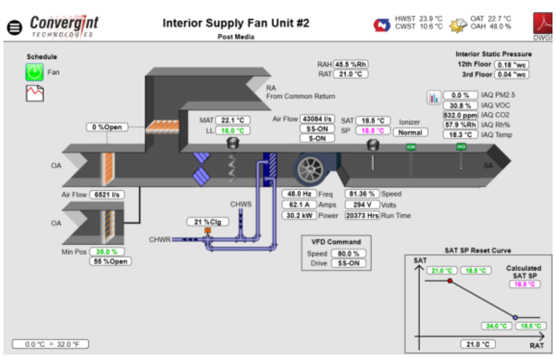
Main BAS Screen – Shows zone lighting

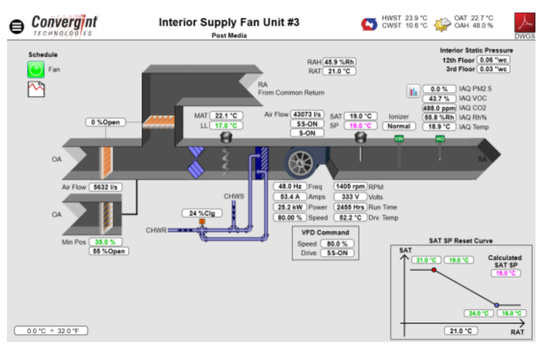


Perimeter Supply Fan

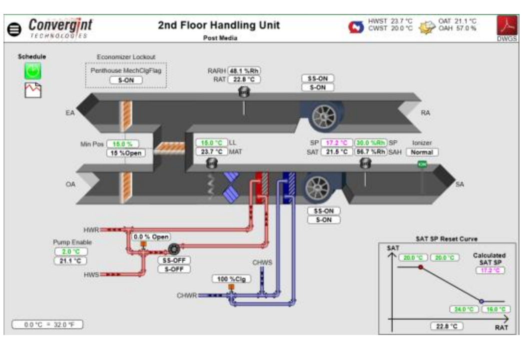


Interior Supply Fans 2 & 3





2nd Floor Air Handling Unit



Domestic Hot Water System

The domestic hot water system is a gas-fired boiler and single storage tank. There are a few tenant DHW heaters. Replacing the boiler is a mid-term measure.

DWH Boiler and Storage Tank

Table 1: DHW Heaters List

Tag	Make	Model	Capacity
DHW-1	LAARS	VW 1010	1010

Lighting System

The lighting system is LED and centrally controlled on the Convergint System with exception of floors 3 to 6. 11 and 12, which are entirely controlled by occupancy sensors. It is important to indicate that the BAS enables the lights to go on, but manual switches located on the floor are used to turn the lights on and off. This results in lights operating for far fewer hours than what is shown on the BAS schedules, which are only authorization schedules. Lights can also be overridden by occupants during unoccupied periods using manual switches that can provide a user adjustable additional ON time, typically 1 hour.

The lighting schedule typically runs from 7:30 AM to 11:00 PM on some floors, and from 8:00 AM to 10:00 PM on others, Monday through Friday. Some floors have shorter operating hours, and certain floors also have lighting schedules on Saturday, Sunday, or both days.

Building Envelope

The building exterior walls for this 1972 building were noted to be in adequate condition, with the roof being in good condition, having been replaced in 2016. It was also indicated during the audit that there were no major issues with either air infiltration or water infiltration through the building envelope. This building's exterior walls are based on a combination of concrete panels and curtain wall system. The precast concrete walls are stained throughout, particularly near vents and the loading dock, which may require periodic cleaning as part of normal maintenance.

Based on the type of construction and age of the building, the overall R-value is estimated to be at about R-5 to R-8, when considering all thermal bridging. The roof has a negligible impact on the heating and cooling load, especially when considering that most of it is over mechanical spaces. The original R-value was estimated at R-10 but is currently estimated at R-20 due to a reroofing retrofit. The roof has a protected membrane roofing system with white stone ballast.

The largest contributor to the heat losses are the windows. The windows that could be observed were in adequate condition and consisted of tinted single pane windows with aluminum frames. Single pane windows in aluminum frames have very low overall R-value and lead to high heating load as well as higher cooling loads. The windows on the South and East walls have films to help reduce the solar heat gain. This translates into lower cooling loads in the summer but higher heating load in the winter. The films, unless they are also low emissive, will not provide significant, or any, net energy savings but will improve comfort conditions by reducing local over-heating in the summer and can also help reduce glare. The specifications for the film installed on the windows were not available. The window-to-wall ratio for this building is estimated at approximately 35%.

Upgrading all the windows would result in significant energy cost savings but the very high cost of the measure results in a very long, or potentially no feasible, payback period. Adding solar films to the north and west exposures would reduce the cooling load and potential local over-heating issues but this measure does not result in an overall net energy gain over the year as it also reduces useful solar gain during the heating period. This measure can be considered primarily for comfort rather than energy efficiency.

Static pressure issues were noted in the building, particularly in the lobby, which experiences negative pressure, resulting in elevator doors not functioning properly when the mechanical penthouse doors are open. This issue is due to the stack effect, and the priority should be to ensure that the penthouse is as airtight as possible, without compromising necessary combustion air make-up. Additionally, all stairwell doors should also be sealed and kept closed, as this can exacerbate the stack effect and contribute to the negative pressure in the lobby. Employing mechanical ventilation to maintain positive pressure in the lobby can lead to high operational costs with minimal impact on pressure control and should only be considered after implementing basic airtightness measures.

OTHER LOADS

The most important load for this building is from the various personal computers and servers found throughout the office floors.

There is no measure to propose regarding computers and servers as they are entirely under tenant control. Only a general energy awareness program, that would include and IT component, can be considered.

Other equipment is the air compressor used for the pneumatic controls as well as the buildings elevators.

Compressor for Pneumatic Controls

The building also has three domestic cold water booster pumps. These pumps are already variable flow.

Domestic Cold Water Booster Pumps – serving the entire complex