

# 2021 Annual Energy Report – Corporate Buildings

Energy Management

Facilities & Property Management

June 7, 2022

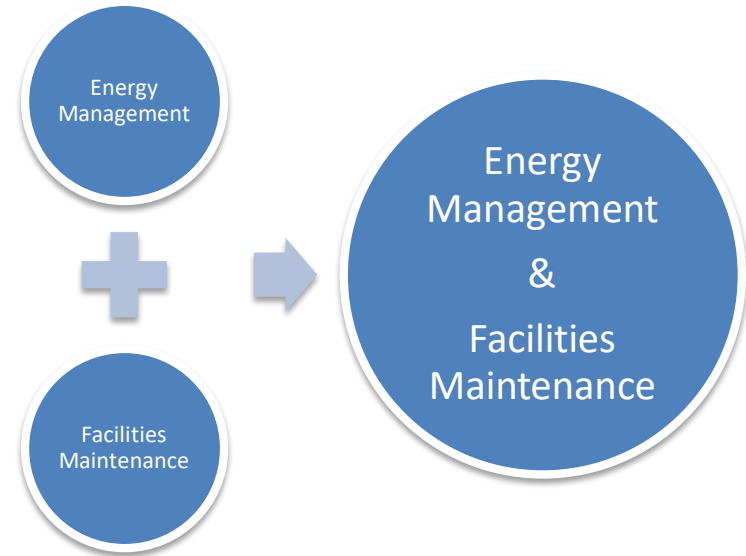


# Agenda

1. Energy Management & Facilities Maintenance Team
2. 2021 Achievements
3. 5 Year Energy Conservation Plan
4. Key Initiatives
  1. Operation optimization
  2. Equipment upgrades & energy retrofits
  3. Tools & standardization
  4. Energy analytics
  5. Low carbon new builds
  6. Energy Awareness
5. Future Initiatives of the Plan

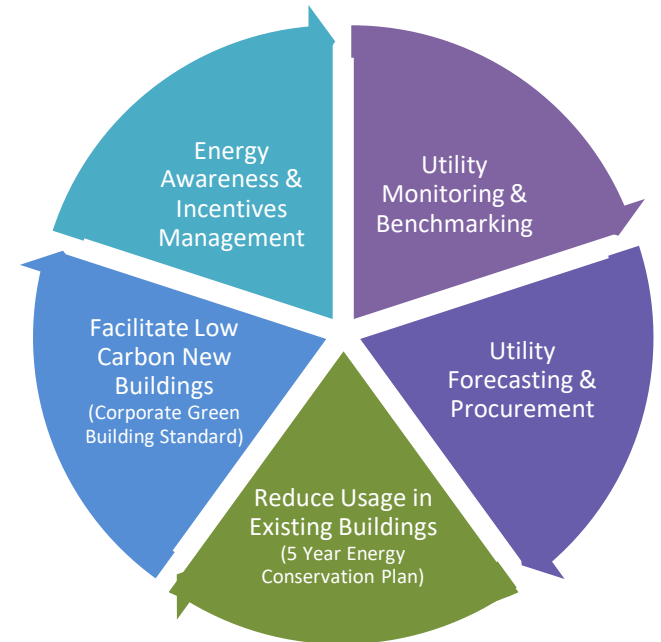
## Energy Management and Facilities Maintenance Team

- Merger of Energy Management with Facilities Maintenance
- One TEAM under Facilities & Property Management in Corporate Services
- Synergies b/w the two teams
- Increased importance on equipment reliability and efficiencies



# Energy Management Team

- Our Mission:
  - Reduce utility use and costs by setting targets, measuring performance, and implementing best practices
- Our Scope:
  - Utility usage in City-owned Properties
  - We fight climate change by reducing energy dependence of City-owned properties



## 2021 Achievements

- 10% lower energy use vs 2018
- 9% lower GHG emissions vs 2018
- 17% lower water use vs 2018
- ISO 50001 Certification
  - First Municipality in Canada to achieve this certification
  - Plan-Do-Check-Act Continuous Improvement Framework
- Energy Star Certification

### Erin Mills Twin Arena

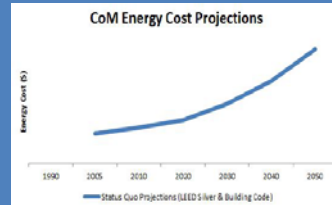


# 5 Year Energy Conservation Plan



## Ontario Regulation 507/18

- Report usage in all existing buildings
- 1% reduction in Energy & GHG Use per year
- ISO 50001 Plan-Do-Check-Act



## Utility Budget Stability

- Mitigate the rising utility costs (projected at 5% annually)
- Protect against utility market fluctuations (30% rise)



## Climate Change Action Plan

- Meet the City's aggressive Community & Corporate targets
- 40% by 2030 and 80% by 2050 compared to 1990 levels



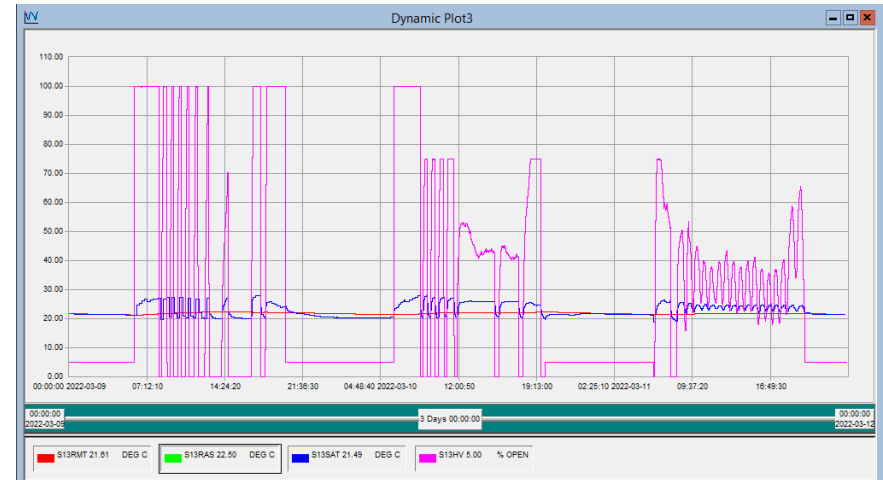
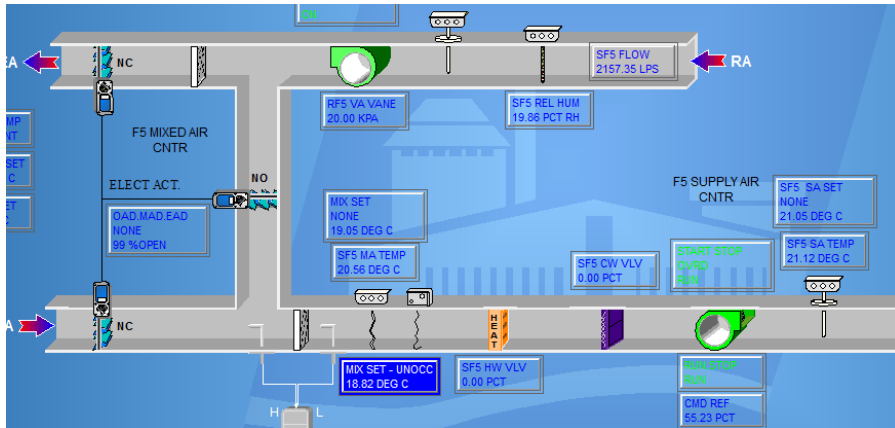
## Net-zero Carbon City

- Support this Visionary Action
- Demonstrate environmental leadership

NEED TO ADDRESS ENERGY & CLIMATE CHANGE IN CITY BUILDINGS

# Key Initiatives – Operation Optimization

- Setback/Shutdown of non-essential equipment during COVID-closures
- Equipment controls optimization – finding and correcting inefficiencies



# Key Initiatives – Equipment Upgrades & Energy Retrofits

- Lighting upgrades to LED
- Pool (Drain & Dehumidifier) heat recovery
- Ice plant upgrades
- Power quality upgrades
- Hybrid heat pump mechanical units





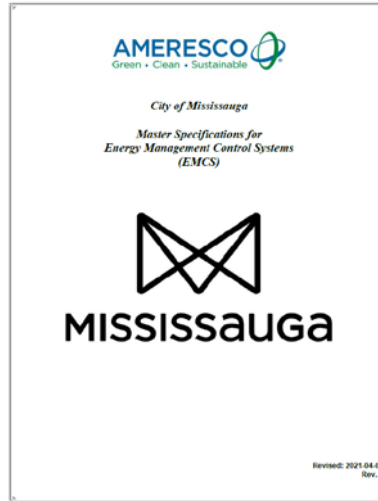
# Key Initiatives – Tools & Standardization


## City of Mississauga Energy Design Guidelines (IP)

### New Construction & Building Alterations/Renovations

Revision No.	Effective Date	Version	Brief Description
0	June 30 <sup>th</sup> , 2016	Issued for Select Internal Review	Initial release to select participants for feedback
1	July 15 <sup>th</sup> , 2016	First Round of Revisions	Includes revisions suggested by select participants and placeholders for additional topics to be added in future revisions
2	July 19 <sup>th</sup> , 2016	Issued for Review by Select Sections	Initial release to FDA, Facility Maintenance, and Security for feedback
3	November 4 <sup>th</sup> , 2016	Issued for Final Review	Includes revisions suggested by FDA, Facility Maintenance, and Security, and includes the B.A.S. and Building Envelope Sections
4	December 19 <sup>th</sup> , 2016	Issued for Final Distribution	Final release to all Parties for implementation on projects
5	January 7 <sup>th</sup> , 2019	Issued with Revision #1	Includes additions to Sections 6.1 and new Section 7
6	February 3, 2020	Issued with Revision #2	Revision to Section 3.3.1
7	December 10, 2020	Issued with Revision #3	Revision to Sections 3.2.1, 3.2.4, 3.3.5 and 3.9
8	March 31, 2021	Issued with Revision #4	Revisions to Sections 1.2 and 4
9	Nov 10, 2021	Issued with Revision #5	Revisions to Sections 6.2

Developed by: Energy Management  
Facilities & Property Management, Corporate Services  
650 Burnhamthorpe Road West, Mississauga, Ontario L5C 3B4



  
**MISSISSAUGA**

Version: 2021.04.05  
Rev. 1

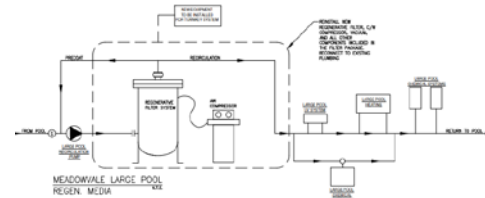
## AQUA PLANS aquatic consultants inc.

### City of Mississauga – Pool Filtration Systems Study

Client  
City of Mississauga

Type of Document  
Comparative Study

Property Names and Addresses  
 Meadowvale Community Centre – 6655 Glen Erin Drive, Mississauga Ontario  
 River Grove Community Centre – 5800 River Grove Drive, Mississauga Ontario  
 South Commones Community Centre – 2233 South Millway, Mississauga Ontario



### City of Mississauga Corporate Green Building Standard

Prepared on: December 30, 2019  
Corporate Services  
Facilities & Property Management  
Energy Management

## Key Initiatives – Energy Analytics

- Utility Bill & Data Management – EEM Suite (energyhippo)
- Real-time metering & monitoring – Atrius Building Insights
- Measurement & verification analysis – RETScreen Expert
- Fault Detection – SkySpark (in progress)



# Key Initiatives – Low Carbon New Builds

- Corporate Green Building Standard for New City-owned Buildings
  - High performance envelopes
  - Electric heat pumps
  - Low Impact Development
  - Mass-Timber construction (CLT)
  - Rooftop Solar PV
  - EV charging infrastructure

Carmen Corbasson Community Centre (Targeting Level 1)



Parameter	Target	Modelled
EUI (kWh/m <sup>2</sup> /year)	570	265
TEDI (kWh/m <sup>2</sup> /year)	45	44.8
GHGI (kgCO <sub>2</sub> /m <sup>2</sup> /year)	83	19

Heat recovery on all Air Handling Units, R24.4 Walls (effective), R41.7 Roof (effective), 50 Bike Racks, 14 EV Charging Station Infrastructure, Cross Laminated Timber (CLT) on the Roof Deck, pool drain heat recovery from both pools, heat pumps with backup condensing boilers, solar PV ready

Burnhamthorpe Community Centre (targeting Level 1)



Parameter	Target	Modelled
EUI (kWh/m <sup>2</sup> /year)	612.9	553.1
TEDI (kWh/m <sup>2</sup> /year)	45	43.3
GHGI (kgCO <sub>2</sub> /m <sup>2</sup> /year)	89.6	69.8

Triple Glazed Windows, R 12.4 Wall (effective), R 47.6 Roof (effective), solar PV, heat recovery - Ice plant and Dehumidifier, Green Roof, Pool Drain Heat Recovery, Gas-Hybrid Heat Pump, 8 EV Chargers, 26 Bicycle racks

Fire Station 125 (Targeting Level 3 for Energy – Net Zero Energy)



Parameter	Target	Modelled
<b>Net Zero Energy Building</b>		
TEDI (kWh/m <sup>2</sup> /year)	30	28.3
GHGI (kgCO <sub>2</sub> /m <sup>2</sup> /year)	5	1.5

Triple Glazed Windows, Air Sourced VRF Heat Pumps with Electric Resistance heating for backup, Solar PV, R-25 Wall (effective), R-60 Roof (effective), Green Roof, Cross-Laminated Timber, Bio-swales,

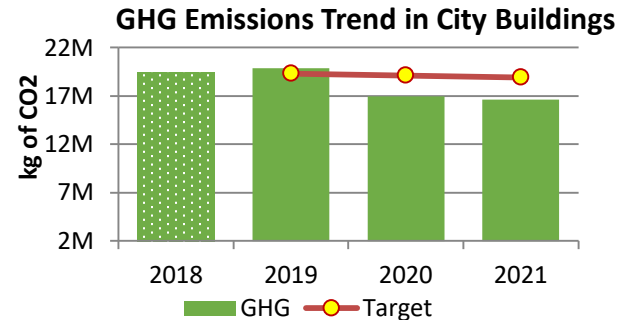
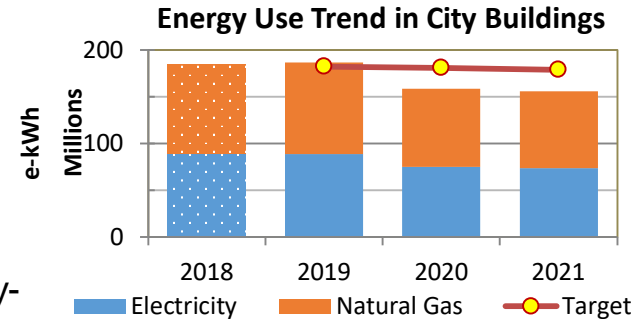
## Key Initiatives – Energy Awareness

- EM program awareness documents
- Regular training on EM tools
- Beyond Energy – Centre of Excellence
  - In-house collaboration to build knowledge and foster alignment
  - Create processes or white papers to improve existing processes or technology
  - 1<sup>st</sup> White Paper: Diving into the Natatorium Environment
- Annual Energy Report



## Future Initiatives of the Plan

- 600 kW Solar PV @ Transit
- Expansion of lighting Upgrades to LED
- Expansion of standardized BAS upgrades
- Operation optimization through Fault Detection & Energy Analytics (SkySpark)
- Facilitate low carbon & net zero energy designs in new City-owned facilities
- Electrification of end-of-life space & hot water heating equipment in our facilities
- Expansion of Solar PV
- Opportunities for deep energy retrofits



## Questions?



For any additional questions, please contact **Sumeet Jhingan**

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