



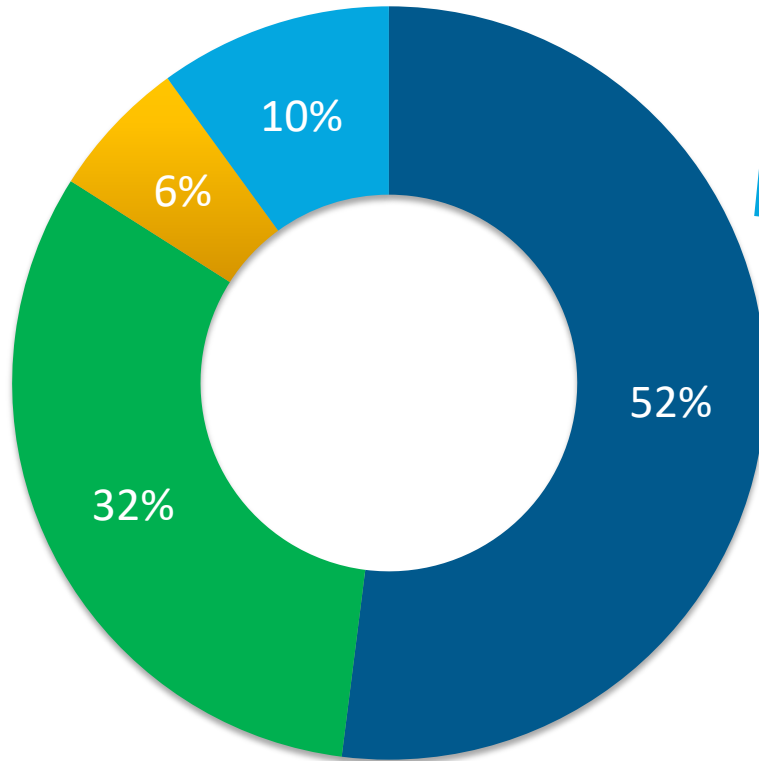
ENERGY EFFICIENCY IN BUILDINGS AND LOW CARBON ENERGY SUPPLY

Dianne Zimmerman, Manager Environment and
Sumeet Jhingan, Manager, Asset Management

Environmental Action Committee

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COMMUNITY GHG'S



The majority of community emissions come from buildings



- buildings
- transportation
- air travel
- industrial

6.2 million t/eCO₂ TOTAL

CITY'S CLIMATE COMMITMENTS



Goal: Mitigation

Reduce GHG emissions by **80% by 2050** (below 1990 levels) with the goal of becoming a net zero community

Goal: Adaptation

Increase resilience and the capacity to deal with and respond to **current and future** climate-related risks

5 Action Pathways

Buildings & Clean Energy

Resilient & Green Infrastructure

Accelerating Discovery & Innovation

Low Emissions Mobility & Transportation

Engagement & Partnerships



BUILDINGS & CLEAN ENERGY

- Reduce greenhouse gases from homes and buildings
- Increase the supply of renewable energy
- Advance low carbon neighbourhoods
- Encourage energy conservation

HOW WILL THE CITY ACHIEVE ITS GOALS?

To meet Mississauga's climate goals, a combined approach to energy from both a demand perspective (e.g. improved energy efficiency) and supply perspective (from low carbon energy sources) will be necessary.

BUILDINGS & CLEAN ENERGY ACTIONS

- **Action #1:** Advance Renewable Energy and Low Carbon Energy Systems
- **Action #2:** Update Mississauga's Official Plan to Strengthen Existing Climate Change Imperative
- **Action #3:** Improve the Energy Efficiency and Climate Resilience of New Buildings
- **Action #4:** Increase the Use and Supply of Renewable Energy at Municipally-Owned Facilities
- **Action #5:** Advance Energy Efficiency and Climate Resilience of Municipally-Owned Buildings
- **Action #6:** Develop a Low Carbon and Resilient Retrofits Program

ACTIONS # 2 & 3

To Improve the energy efficiency and climate resilience of new buildings, the City will:

- Update the 2012 Green Development Standard to include energy and resilience considerations within building, site features, and boulevard.
- Revise the development application requirements and update the complete application criteria in the Official Plan to align with the updated Green Development Standards
- Identify opportunities to introduce new legal and/or policy tools, including by-laws, to require implementation of climate resilience measures (e.g., green roof by-law) in new buildings

ACTIONS # 4 & 5



ENERGY MANAGEMENT:

- Solar studies
- 5-year Energy Conservation Plan
- Corporate Green Building Standard

SOLAR STUDIES

7 Rooftops analyzed:

- Carmen Corbasson CC
- Clarkson CC
- Erin Mills Twin Arena
- Mississauga Valley CC
- Paramount Fine Foods Centre
- Edward J. Dowling Transit Facility

Potential Capacity: 3.5 MW



5 YEAR ENERGY CONSERVATION PLAN (2019 – 2023)



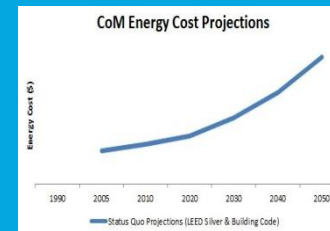
Ontario Regulation 507/18

- Provincial Requirement to report usage
- Develop & implement a CDM Plan starting in 2019



80% GHG reduction by 2050

- Need to meet the City's aggressive Community & Corporate targets



Utility Budget Stability

- Need to mitigate the rising utility costs (projected at 3% annually)



Net-zero Carbon City

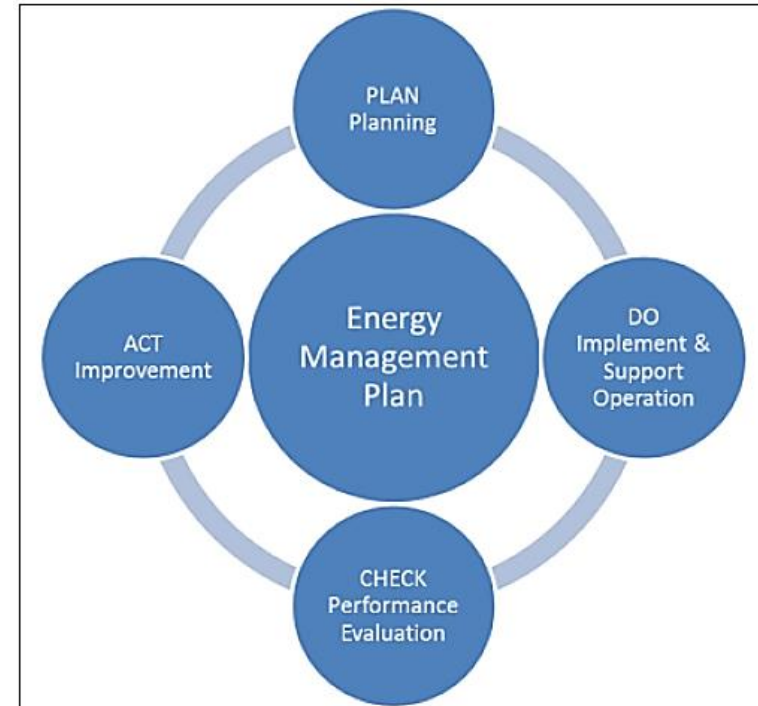
- Need to support this Visionary Action
- Need to demonstrate environmental leadership

NEED TO ADDRESS ENERGY & CLIMATE CHANGE IN CITY BUILDINGS

5 YEAR ENERGY CONSERVATION PLAN

ISO 50001 Continual Improvement Framework

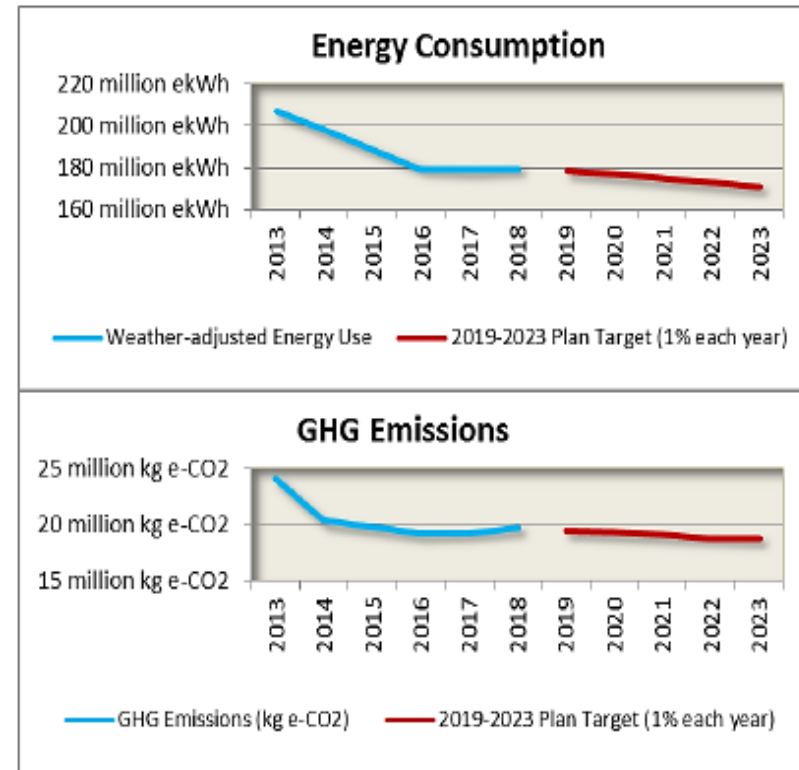
- PLAN: Set a target of 5% energy use and GHG emissions by 2023 over 2018; plan a list of projects
- DO: Request funding each year and execute projects over the 5 years
- CHECK: Utilize real-time utility metering to track performance
- ACT: Utilize the data to make improvements and continually drive energy performance



5 YEAR ENERGY CONSERVATION PLAN

Key Performance Indicators:

- Energy Consumption
 - Electricity & Natural Gas
- Greenhouse Gas Emissions
 - Using site factors to account for distribution losses
- Measured annually over 2018



CORPORATE GREEN BUILDING STANDARD

- Approved by Council in December 2019
- Applies to City-owned Buildings for new Construction and Major Renovations
- To improve environmental performance
- Reduce operating & maintenance costs
- Place Mississauga as a leader in green building



LEED Silver (old City Standard)

CGB Standard (New)

Energy & Climate Change

- Energy performance
- Commissioning
- Ozone depleting compounds

- Energy and emissions performance
- Monitoring-based commissioning/verification
- Air tightness testing
- On-site renewables
- Metering and benchmarking
- Resilience performance
- Ozone depleting compounds

Sustainable Sites

- Erosion and sediment control
- Bicycle infrastructure
- Stormwater management

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- Bicycle infrastructure
- Stormwater management
- Light pollution
- Biodiversity*

Water

- Water use intensity

- Water use intensity

Materials & Resources

- Construction waste management
- Recycled Content

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- Low-impact materials (recycled content)
- Embodied carbon footprint*

Indoor Environmental Quality

- Low-emitting materials (adhesives, sealants, paints, coatings, flooring)

- Low-impact materials (adhesives, sealants, paints, coatings, flooring)

OUR APPROACH – THREE LEVELS OF PERFORMANCE

Level 1: 'Must Have'

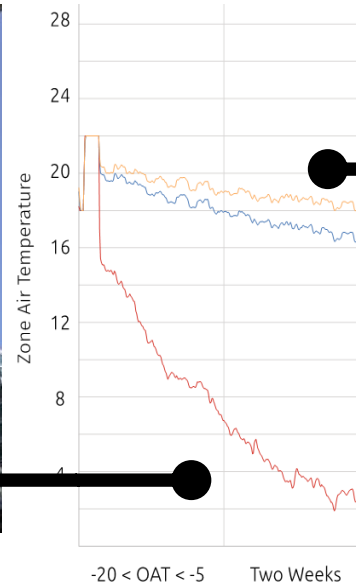
Performance targets that are required in all buildings and facilities

Level 2: 'Highly Desirable'

Performance targets that represent a more ambitious level of performance

Level 3: 'If Possible'

Performance targets that are considered 'best in class' and that should be pursued when project parameters allow



Current approach:

- Increased mechanical equipment
- Increased dependence on energy
- Complicated controls to operate

Building envelope-first approach

- Reduced mechanical equipment
- Increased resiliency to extreme events
- Easy to operate

What does this mean for Mississauga's buildings?

5.2



Comfortable Buildings

EcoLock



George Brown College



TRCA Headquarters



TRCA Headquarters



Elementary Teachers' Federation of Ontario



Vancouver Fire Hall No. 17

Cost & Benefits of High Performance Buildings 5.2

- ✓ Cost Premium over current LEED® Silver building
 - ✓ 2.6% – 5% for Level 1
 - ✓ 7.6% – 12.5% for Level 2
 - ✓ 20% – 30% for Level 3
- ✓ Lower greenhouse gas emissions
 - ✓ 2.5% – 12.5% lower for Level 1
 - ✓ 20.0% – 50.0% lower for Level 2
 - ✓ 60.0% – 85.0% lower for Level 3
- ✓ Lower energy, waste, and water costs
- ✓ Lower operational and maintenance costs
- ✓ Other Benefits:
 - ✓ Increased productivity and staff retention
 - ✓ Improved health and reduced sick days
 - ✓ Improved resilience to extreme events
 - ✓ Create jobs and GDP

Feedback and questions