

Municipal Corporate Energy Managers Community of Practice Workshop

We will begin at 10 am.



Clean Air Partnership



Workshop Agenda

- **Corporate Energy Managers Guide Overview**
- **MCEM COP 2021 Workplan Discussion**
- **Updates from members on priorities, issues, actions, learnings and sharings**
- **Google Group Questions Follow Up**
- **Keir Brownstone, Toronto Community Housing**



Where we are now

- Many municipalities have corporate energy plans that identify targets for energy reduction but many of them are not in line with climate emergency declarations and targets. Many of these Plans were approved prior to climate emergency declarations
- Many BC municipalities have made zero carbon commitments – offsets are used (which is fine don't get me wrong, but doesn't necessarily change the systems we need to change to get us on our net zero trajectory)
- How do municipal buildings get to zero emissions?

Where we are now

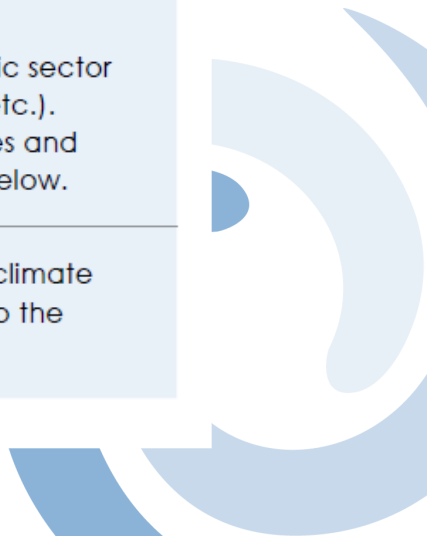
ABOUT THE MUNICIPALITY AND ITS OPERATIONS

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
ABOUT THE MUNICIPALITY	Where it is located, geographical size, population, expected population growth, employment growth, how that growth is expected to influence energy use.
SERVICES THE MUNICIPALITY PROVIDES	A description of the departments within the municipality and the types of services, including community services, the municipality provides.
TYPES OF FACILITIES THE MUNICIPALITY OPERATES AND MANAGES	A summary of the types of buildings and their functionality such as administration, community centres, pools, ice rinks, fire stations, cultural facilities, libraries, waste, water, transit, long-term care homes, day care centres, storage, streetlights and traffic signals.
DESCRIPTION OF MUNICIPAL FLEET VEHICLES AND EQUIPMENT	Description of the types and use of vehicles including light, medium and heavy-duty vehicles, as well as equipment used.
SUMMARY OF MAIN TAKEAWAYS FROM THIS SECTION	Summarizing the “so what” of how the municipal context influences how the municipality uses energy, its opportunities to improve efficiency, challenges it faces related to options available for efficiency gains within different facilities and service areas.

THE VALUE AND RATIONALE FOR MUNICIPAL CORPORATE ENERGY PLANS

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
TO REDUCE ENERGY USE AND COSTS	Description of the role energy use plays in the delivery of municipal services and how good management requires the tracking of energy use in order to identify opportunities to increase efficiency. The energy costs incurred by the municipality over the past few years and how energy costs impact municipal budgets. The role that increased energy efficiency can play in reducing the municipality's vulnerability to energy and carbon price increases over time.
TO INCREASE THE EFFICIENCY OF MUNICIPAL SERVICE DELIVERY	A core responsibility of municipalities is to practice good corporate management and ensure the efficient use of energy to deliver the services it provides to the community.
TO ADDRESS CLIMATE CHANGE AND REDUCE GREENHOUSE GAS EMISSIONS (GHGS)	The connection between energy used by the municipality and climate change. How the municipality has a responsibility to reduce and eventually eliminate GHG emissions released by the municipality's operations.
TO INCREASE RESILIENCE TO ENERGY DISRUPTIONS	Description of the connection between the Plan and how it improves the municipality's ability to continue to deliver services during periods of energy disruption.
BETTER MANAGEMENT OF MUNICIPAL ASSETS	Description of the connection between the Plan and asset management plans. How management practices associated with the energy plan can support the state of good repair of municipal assets.
ADVANCEMENT OF SUSTAINABLE PROCUREMENT GOALS/POLICIES	Description of the connection between the Plan and green or sustainable procurement policies. The Plan can provide a mechanism to advance sustainable procurement practices.
ENERGY LITERACY OPPORTUNITY FOR MUNICIPAL COUNCIL, STAFF AND COMMUNITY	The Plan presents an ideal opportunity to educate municipal staff and the community regarding where energy comes from, its sources, how it is used, the need to reduce the costs and impacts associated with our energy use, efforts that have or will be undertaken at other levels of government that impacts municipal energy use (e.g. coal phase out and upcoming increased natural gas for electricity generation).

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
<p>DEMONSTRATING LEADERSHIP BY EXAMPLE</p>	<p>Municipalities have declared climate emergencies, adopted GHG reduction targets and it is critical to credibility that if the municipality is encouraging others to reduce their energy and GHG emissions that they also practice what they promote and serve as an example to others within their community and beyond.</p>
<p>TO MEET PROVINCIAL REQUIREMENTS</p>	<p>In Ontario there is a provincial regulation (Ontario Regulation 507/18) that requires all public sector agencies (municipalities, schools, hospitals, etc.). Provide a short description of its origin, changes and present requirements. Pull out box provided below.</p>
<p>ALIGNMENT WITH PROVINCIAL AND FEDERAL CLIMATE PLANS AND TARGETS</p>	<p>Highlight of provincial and federal energy and climate commitments and how this Plan contributes to the advancement of those commitments.</p>



BACKGROUND ON MUNICIPAL ENERGY USE

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
TOTAL ENERGY USE AND GHG EMISSIONS	Provide total energy use (often expressed in Joules and total GHG emissions (often expressed in CO ₂ equivalents)
BREAKDOWN OF ENERGY USE	Pie chart of types of energy used (electricity, natural gas, propane, diesel, gasoline, renewables, biogas, etc.)
BREAKDOWN OF GHG EMISSIONS	GHG emissions connected to municipal energy use and their comparative contributions across fuel types
BREAKDOWN IN ENERGY USE ACROSS FACILITY/SERVICE TYPES	Energy use across facilities is often presented by sectors (Buildings & Facilities; Fleet & Equipment; Wastewater & Water Pumping; Outdoor Lights; Waste; Employee Commuting & Municipal Air Travel). In addition, when facilities are presented, they are often grouped/benchmarked across similar use/features (community centres with similar features such as pools/arenas) being compared to better enable the municipality to identify which buildings are functioning more efficiently than others and where efficiency opportunities are largest.
WHAT IS AND IS NOT INCLUDED IN THE ENERGY AND GHG INVENTORY	It is important to be clear about what is included in the inventory and what is not. Inventories include Scope 1 emissions (all direct emissions from the activities of an organisation or under their control; including fuel combustion on site such as from natural gas boilers, fleet vehicles and air-conditioning leaks) but exclude emissions related to extraction, fugitive emissions and transmission losses. Most also include some Scope 2 emissions from electricity generation. However, most do not include the scope 2 emissions from the extraction and distribution of natural gas. Very few inventories factor in Scope 3 emissions which are the indirect emissions resulting from activities that are supply chain related and beyond a municipality's control such as consumption energy and emissions. Transparency associated with what is within and beyond scope are essential to maintaining consistency or comparing inventories across time periods.

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
METHODOLOGY RELATED TO ENERGY AND GHG INVENTORY	In addition to clearly identifying what is within and beyond scope, it is important to be clear about the methodology used to generate the inventory. Factors such as data sources, data source weaknesses, weather adjustments, and GHG coefficients used are also important to clearly outline in order to maintain transparency and enable consistency across inventories. These are often described in the appendix of the Plan.
THE ROLE OF UTILITY BILL VERIFICATION	It is important to check utility bills for errors by comparing bills to meters. Per units, rate codes and delivery costs differentiation are some of the common metrics that are used to highlight possible errors. For those municipalities with revolving funds in place, savings from billing errors are often added to the revolving fund when they are identified outside the fiscal year they occurred in.
ENERGY FORECASTING AND BUDGETING	Energy forecasting in some Plans include population growth and an analysis of how that growth is likely to impact facility use or the need for new facilities, increased hours, etc. Otherwise, forecasts often take per capita use and multiply it by population growth projections. For energy costs, factors often considered include expected increases in rates, consumption, fixed costs such as delivery, and budget limitations/allocations. There are software/third party organizations that specialize in estimating future energy costs. It is essential to be able to illustrate the changes of energy cost over the years in order to validate budget increases for the energy use of the municipality despite energy efficiency action implementation. Due to common increases in energy costs it is important to refer to energy savings as cost avoidance and document what energy costs would be if no energy efficiency efforts had been implemented.

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
<p>EXPLANATION OF THE DIFFERENCE BETWEEN ENERGY USE AND ENERGY USE INTENSITY</p>	<p>Absolute energy use metrics speak to the total energy used. This can be presented in aggregated form where various forms of energy use are converted to equivalent Joules, or presented via their individual sources (electricity, natural gas, diesel, gasoline, etc.). Energy use intensity expresses energy use as a function of some other denominator such as population or m². Energy use intensity comparisons across similar facility types allow for the ability to benchmark which facilities are performing more efficiency than others (thereby enabling opportunities to identify leading practices or facilities that present the largest efficiently opportunity gains). While there are several municipalities that have set energy use intensity targets within their energy plans, climate change scientists typically use absolute GHG reduction targets and not simply per capita or intensity emissions. Therefore, in order to align with scientific GHG targets it is important for municipalities to set absolute GHG emission reductions even if they use an energy use intensity reduction. In addition, if an energy use intensity target is set by the municipality there is likely the need for fuel switching and ensuring a fossil fuel free electrical grid to be a priority action.</p>
<p>ENERGY LITERACY</p>	<p>Energy literacy is the knowledge of how energy is used in society, its sources and impacts, and the ability to make informed decisions on what the right energy choice is. A recent survey revealed that Canadians have a good general knowledge of energy use and relative cost but lack detailed knowledge about sources of energy fuels, as well as sources and linkages with environmental impacts. Plans present an opportunity to provide background on how much energy is used, where it comes from, its impacts and how energy use can be better managed to reduce the impacts arising from municipal energy use.</p>
<p>SUMMARY OF KEY INFORMATION THAT THE INVENTORY INFORMS</p>	<p>Considering the often exhaustive amount of background information contained within this section of the Plan, it is important to provide a narrative of key data to help share the leading takeaways such as (but not limited to): how the municipality uses energy, and for what, where that energy comes from, the impacts associated with energy use, and top opportunities for increasing efficiency and reducing impacts.</p>

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
<p>HOW THIS ENERGY PLAN ALIGNS WITH OTHER MUNICIPAL PLANS</p>	<p>It is often of value to present a summary of the other municipal plans that the Plan is aligned with. This can include (but is not limited to): Official and Strategic Plans, Sustainability Plans, Community Energy Plans, Climate Mitigation and Resilience Plans, Asset Management Plans, and Procurement Policies.</p>
<p>ROLE AND RESPONSIBILITY OF ENERGY STAFF/DEPARTMENTS</p>	<p>Describe the department and staff who will be leading the implementation of the Plan and will be responsible for progress monitoring and reporting. Highlight the role that other departments need to play in order to advance implementation.</p>
<p>ROLE AND RESPONSIBILITY OF INTER-DEPARTMENTAL STAFF TEAMS/DEPARTMENT HEADS</p>	<p>Many municipalities have developed inter-departmental teams to support the implementation of their Plan and to ensure that there is recognition across the municipality that energy staff are unable to implement the Plan without the support of municipal departments. Demonstrated support from senior management is critical to gaining and maintaining support from across the municipality.</p>
<p>ROLE AND RESPONSIBILITY OF COUNCIL</p>	<p>Council ultimately adopts draft Plans and typically sets GHG reduction targets that the Plan should align with. Municipal Councils play a critical role in setting the progress reporting and financial policies that guide energy management. Annual progress reporting on Plan implementation is a leading practice.</p>

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
<p>HOW THE PLAN ALIGNS WITH OTHER GOVERNMENT TARGETS</p>	<p>Due to the different time scales of municipal corporate and community action plans, as well as provincial and federal GHG reduction target commitments, discrepancies between inventories undertaken and target dates can make alignment across the levels of government challenging. To address this, track how aligned the reduction targets within a specific time frame coincide with the level of ambition and action needed to achieve longer-term targets. If there is a misalignment the plan should state why this discrepancy exists and what the municipality and other levels of government will need to do in order to ensure that shorter time frame plans are in alignment with longer-term GHG reduction targets.</p>
<p>PLAN MILESTONE PROCESS</p>	<p>There is a common pathway that is often recognized within Corporate Energy Plans that is meant to ensure progress and accountability and it makes sense for the Plan to identify the progress pathway it will follow to be able to ensure implementation towards Plan commitments and targets. Some of the most common pathways are provided in Figure 1.</p>
<p>PLAN GOALS AND PRINCIPLES</p>	<p>This section often speaks to the larger picture goals the Plan aims to advance and the principles that will govern decision making and action identification and often speaks to the preferred state of energy management for the municipality. Examples of Plan goals include: Advances a Culture of Conservation; Enhances a Corporate Structure and Process for Managing Energy and GHGs; Bringing Lifecycle Costing into Asset Management Planning; Making Progress Towards Longer-Term GHG Targets. City of Burlington's preferred state summary provides an example.</p>

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
<p>ALIGNMENT WITH PROCUREMENT POLICY</p>	<p>The most common barriers cited by energy staff to advancing energy efficiency procurement are related to the decentralization of purchasing decisions and not factoring in energy costs or consulting with energy staff. If there is no corporate-wide culture of energy conservation there is often benefit to ensuring that energy staff are involved in purchases that will have energy impacts. For example, the Town of Caledon has a purchasing requirement that energy and environment staff must be engaged in any purchase above 10K in order to ensure the best value for the Town.</p>
<p>ALIGNMENT WITH ASSET MANAGEMENT PLAN</p>	<p>Embedding energy planning into asset management plans provides significant opportunities to ensure a state of good repair. This integration also provides a structural mechanism for municipalities to move from short term payback actions toward life-cycle costing decision making required to meet GHG reduction goals.</p>
<p>FINANCIAL POLICY RE: ACTION IDENTIFICATION AND APPROVAL</p>	<p>This is where the Plan outlines the financial framework/ methodology it will use to identify and prioritize action decision making. Many municipalities are still using an up to 10-year payback financial decision framework (where operational savings pay back for costs of the actions), rather than a lifecycle costing approach that factors in capital and operational costs over the lifespan of that product. Very few municipalities are able to access the data they would need to undertake a full supply chain lifecycle costing analysis but all municipalities have access to the data that would enable them to move from payback to a total cost of ownership financial methodology. There are additional financial frameworks which are further explored in Section 2 such as carbon budgeting, carbon offset integration, and social costs of carbon that are critical to being able to move towards 2050 net zero targets. Municipalities can unintentionally undermine GHG reduction targets by cherry picking cheaper energy reductions in the short term, which results in making longer term targets more expensive to achieve.</p>

THE CITY OF BURLINGTON'S PREFERRED STATE

- 1) **The City of Burlington produces no net carbon releases** from its activities and includes renewable energy, where feasible, in all its facilities.
- 2) **The City of Burlington manages its energy** in a way that reduces the burden on ratepayers, while maintaining a high level of service for residents and businesses, and a healthy work environment.
- 3) **City of Burlington staff members have the training** and information they require to effectively and efficiently manage their energy use and emissions within their areas of responsibilities.
- 4) **Burlington collaborates with others** both inside and outside the corporation, such as technology firms, to enhance knowledge of how to use and manage operation systems to maximize efficiency and reduce emissions.
- 5) **The City of Burlington keeps aware** of initiatives in other municipalities and organizations that are designed to reduce energy use and emissions and assesses the applicability of these initiatives to the City. This includes continuing participation in the municipal energy managers community of practice and other appropriate networks.
- 6) **The City is constantly piloting** and evaluating innovative ways of increasing energy efficiency, using renewable energy, and reducing GHG emissions.
- 7) **New equipment is chosen** with a consideration of its need/necessity, energy use, emissions, and life-cycle cost.
- 8) **The City measures** and monitors energy use and greenhouse gas emissions to ensure continual improvement.
- 9) **Council and senior management have knowledge** of energy use and emissions from City operations.
- 10) **The City leverages its expenditures** on energy efficiency, renewables, and emission reduction opportunities by taking advantage of incentives offered by utilities, IESO and other levels of government.



CURRENT AND PAST MEASURES AND RESULTS

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
TYPES OF ACTIONS	Many Plans provide an overview of the types of actions that were undertaken via case studies and progress towards targets and key performance indicators. Different types of energy actions include: Energy Management (e.g. Building Automation Systems (BAS), sub-metering, Energy management systems, Real-time monitoring, Lighting Retrofits, Mechanical Systems, Building Envelope/ Structural, Fuel-Switching, Renewables, Storage).
TARGETS	A chart is useful to indicate progress on each of the targets. If targets were not achieved, provide a description of the factors that limited the implementation required.
CHALLENGES ENCOUNTERED AND LESSONS LEARNED	Many Plans include a narrative section that provides a summary description of the implementation challenges encountered, how those will be addressed in the future, and lessons learned to assist other municipalities advancing energy reduction efforts.
CASE STUDIES	Case studies play a significant role in sharing the state of implementation and often show diversity both in the facilities and departments engaged, as well as across types of actions (energy management, lighting, mechanical systems, renewables, mechanical upgrades, building envelope and storage).



PROPOSED FUTURE MEASURES AND EXPECTED RESULTS

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
TYPES OF ACTIONS	Plans typically provide a narrative overview of the proposed future actions (by facility or type) as well as an appendix either in case study format or table.
TARGETS	Plan should have targets that are aligned and supportive of longer term GHG reduction goals. If past plans did not achieve GHG reduction targets, then the new Plan should increase the scale of ambition to compensate.
DECISION MAKING STRUCTURE	Some Plans provide a list of slated actions for implementation for each facility. For others, Council approves a decision-making methodology that describes how actions will be prioritized based on financial and other criteria. The value of the latter is that it enables the Plans to be kept up to date and is a more streamlined approach allowing for accelerated implementation and bundling of energy projects.
PERFORMANCE INDICATORS	<ul style="list-style-type: none"> » Total GHG emissions – tonnes of carbon dioxide equivalent » Total energy use – gigajoules or kilowatt-hours equivalent » Total electricity demand – gigajoules and megawatt-hours » Total energy costs » Total savings achieved/avoided costs » Grid electricity demand – gigajoules and megawatt-hours » Electricity self-generation – gigajoules and megawatt-hours » Total fossil fuel demand for buildings – natural units and gigajoules or megawatt-hour equivalents » Total fossil fuel demand for fleets – natural units and gigajoules or megawatt-hour equivalents » Other fossil fuel demand – natural units and gigajoules or megawatt-hour equivalents » Energy intensity of buildings – energy use per unit floor area » Thermal energy intensity of buildings – thermal energy (fossil energy) per unit floor area » Weather normalized energy use – weather corrected total energy use » Total vehicle-distance travelled by fuel type » Average fuel efficiency of the fleet (MJ/km or ekWh/km, and L/100 km for fossil use) » Disaggregated data are desirable wherever possible, e.g. per building, per function, per vehicle etc.



MUNICIPAL FLEETS

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
<p>SUSTAINABLE FLEETS PLAN</p>	<p>Many municipalities have developed Green/Sustainable Fleet Plans that undertake actions related to: fleet optimization and right-sizing; use of telematics; incorporating criteria such as total life-cycle costing, operational viability, available fuel options and environmental impacts into purchase decision making; anti-idling behaviours and technologies; driver training; active transportation opportunities; increased use of electric and low-emission vehicles. It makes sense to highlight these actions and plans within corporate energy plans even if not legislatively required as it is part of the energy used by the municipality to deliver its services and responsibilities.</p>
<p>TARGETS (SHORT AND LONGER TERM)</p>	<p>Highlight where there are opportunities for energy and GHG reductions including the state of current and future market opportunities needed to address GHG reductions targets from municipal fleets.</p>
<p>PAST ACTIONS UNDERTAKEN</p>	<p>Provide a summary of past actions as well as a few case studies to describe the types of actions that were undertaken and the results and outcomes.</p>
<p>FUTURE ACTIONS</p>	<p>Provide a summary of the prioritization of upcoming actions as well as how past actions will be continued and/or accelerated.</p>
<p>CORPORATE ELECTRIC/LOW EMISSION VEHICLE STRATEGY</p>	<p>While new markets and opportunities are emerging (e.g. electric vehicles and lower emission fuels such as biodiesel and/or renewable natural gas), effective strategies already available (e.g. right-sizing, trip reduction, use of cargo bikes, etc.) will continue to play an important role to address energy and carbon emissions resulting from fleets services. Energy Plans provide an opportunity to explain upcoming opportunities. For example, the City of Pickering's EV advancements efforts highlighted in their Energy Plan.</p>
<p>PROGRESS REPORTING</p>	<p>Identify the process and timeframe to monitor energy use, emissions and progress reporting to councils and the public on plan implementation and outcomes. Progress reports are often submitted to council on an annual basis.</p>



WATER PUMPING AND CONSERVATION

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
WATER SERVICES DESCRIPTION	Plans present an opportunity to describe to staff and council how water services are delivered, the amount of energy used and reduction opportunities, and impacts resulting from the delivery of these services.
TARGETS	Sector/departmental targets provide an opportunity to show how different municipal services contribute to overall energy use and GHG emissions and the opportunities for reduction within that sector towards the municipal wide targets.
ACTION UNDERTAKEN AND ACTIONS SLATED FOR IMPLEMENTATION	A description of the top past and future actions.
OPTIONS/CHALLENGES FOR THIS SERVICE TO ACHIEVE LONGER-TERM TARGETS	Speaks to the state of where the technology and market is at present and where it needs to go in order to enable the municipality to achieve longer-term targets.

EMPLOYEE TRAVEL

TOP LEVEL TOPICS	DESCRIPTION OF CONTENT
STAFF COMMUTING SURVEY	Some municipalities have reduced energy and emissions resulting from commute trips of municipal staff. Undertaking an employee survey can assist the municipality to better understand commuting practices and barriers and opportunities that would enable staff to choose less polluting forms of commuting options.
TRANSPORTATION DEMAND MANAGEMENT (TDM) PROGRAMS	Many municipalities offer a range of TDM programs and services to assist employees to use sustainable modes of transportation including public transit, carpooling, walking and cycling.
TELECOMMUTING POLICY	Telecommuting (working from home) policies and practices are a core component of many TDM programs. In this section the municipality normally speaks to the policy, how it is advanced, the progress and outcomes to date, and how it can be improved to better meet the needs of the municipality and their staff.
STAFF ELECTRIC VEHICLE POLICY	With the evolving improvements in the passenger electric vehicle market, many municipalities have identified workplace EV charging policies as a priority action to support municipal staff's ability to use electric vehicles for their commuting purposes.

Where we are now – common actions

Common Actions in 2019 Plans	Description of Actions
Energy Management	Building Automation Systems, Energy budgeting, Energy sub-metering, Energy monitoring and tracking systems (either real-time or
Lighting	Switching to LED lighting
Commissioning and RE-Commissioning	Making sure building elements such as heating, cooling, air handling, water and refrigeration systems work as they should. Commissioning also works towards improved energy usage and reduced operation and maintenance costs.
Mechanical system upgrades	Increasing the energy efficiency performance of mechanical systems upon replacement (water heaters/HVAC/chillers/fans/etc.), pneumatic upgrades, moving to heat pumps, Heat recovery systems,

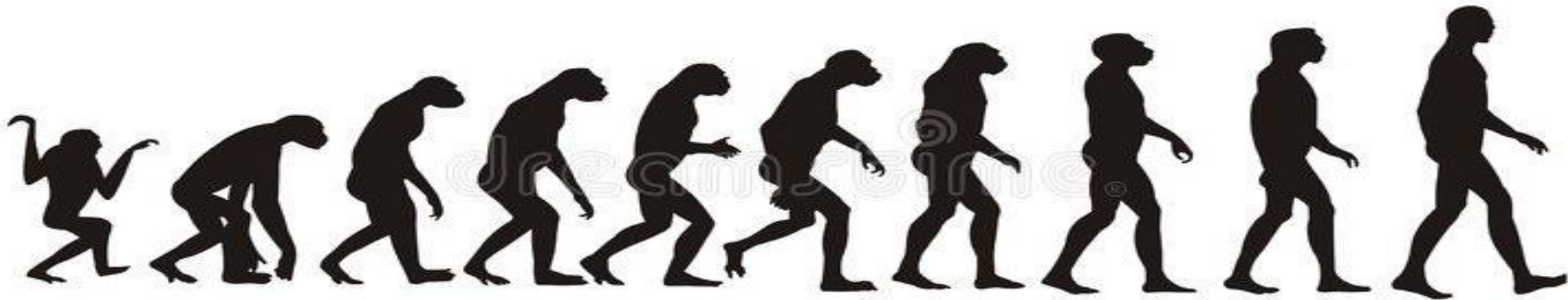
Where we need to go....

Actions Requiring Acceleration	Description of Actions
Building Envelope (Structural)	Exterior cladding, insulation, roof replacements, window and door replacement, foundation repairs, etc.
Fuel-Switching	Moving from fossil fuel such as natural gas to electricity through such measures such as geo-exchange which uses heat pump technology to take advantage of the temperature differential between outside air, the ground or water and the inside of the building to provide thermal heat and water heating. Air source heat pumps and biogas or renewable natural gas can also be used to replace fossil fuels.
Renewable Energy	Solar PV, Solar thermal, Solar walls, solar carports for EV charging, building integrated systems where solar panels are integrated into the building envelope such as windows and roofs
Energy Storage	Battery back – up which can be combined with Solar PV to provide electricity during energy disruptions, replace natural gas and diesel generators.
Financial Policies	Moving from pay-back to lifecycle costing, bringing in scope 2 emissions for natural gas, bringing in carbon pricing and budgeting approaches.

Pathway to get there

Process Flow





**Alignment
between Energy
Plans and
Climate
Emergency
Declarations**

**Asset
Management
Zero Over Time
Integration**

**Lifecycle Costing,
Internal Carbon Price,
Discount Rate,
Revolving Fund,
Recoverable Debt &
Public/Private
Partnerships**

**Monitoring to
Verify Savings
and Operational
Performance**

**Moving from
Silos to Teams
and Building
Science
Expertise**



**Energy
Plans to
Emissions
Plans**

**Update to Municipal
Corporate Green
Development
Standards/Carbon
Budgeting**

**Financial
Policies**

**Measurement
and Progress
Reporting**

**Integrated
Design**

Pathway

- **Total Cost of Ownership – bring together up-front costs and operational costs. This is critical!!!**
- **Make sure Plans consider emissions as a primary goal of Plan, not just short-term payback – 8 year pay backs won't get you where you need to go.**
- **Corporate Green Standards be adopted or updated to be net zero emission standard.**



Journey

- **Municipal Corporate Green Standards**
- **Carbon Budgeting**
- **Shadow Carbon Pricing**
- **Discount Rate**
- **Revolving Fund, Recoverable Debt, Public/Private Partnerships**
- **Energy and Resilience**
- **Monitoring, Tracking and Reporting**
- **Integrated Design**



2021 Webinars & Workshop

- Net Zero RFPs – March
- Corporate Green Standards
- Toronto/Hamilton Community Housing Approach
- Integrated Design
- Asset Management Alignment Shadow Carbon Price
- Energy Storage
- Public Private Partnerships
- Net Zero Case Studies
- Net Zero Costing and Business Planning
- Meetings once a month presentation and roundtables
- Need to hear back from network on what is working, what can be improved. Please, please, pretty please, fill out evaluations and provide suggestions for improvements



Google Group Questions

- **Pool Drain Heat Recovery: vendors, costs, experience results**
- **Sports Field Lighting: assessment, photometric analysis, operations, costs, return, etc**
- **Commissioning Scope of Work: New and Existing Building**
- **Pool heaters**
- **Vendor Experience**



- [Link to Corporate Energy Plan Guide:
https://www.cleanairpartnership.org/wp-content/uploads/2021/01/CASC-CDM-Guide.pdf](https://www.cleanairpartnership.org/wp-content/uploads/2021/01/CASC-CDM-Guide.pdf)
- [Link to Corporate Energy Managers COP Hub:
https://guides.co/g/corporate-energy-managers-community-of-practice/190352](https://guides.co/g/corporate-energy-managers-community-of-practice/190352)

