



Hamilton

INFORMATION REPORT

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	November 4, 2020
SUBJECT/REPORT NO:	Updated Timelines and SMART Corporate Goals and Areas of Focus for Climate Mitigation and Adaptation (CMO19008(a)/HSC19073(a)) (City Wide) (Outstanding Business List Item)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Trevor Imhoff (905) 546-2424 Ext. 1308
SUBMITTED BY: SIGNATURE:	Janette Smith City Manager
SUBMITTED BY: SIGNATURE:	Paul Johnson General Manager Healthy and Safe Communities Department

COUNCIL DIRECTION

The Board of Health at its meeting on June 17, 2019, and subsequently approved by Council at its meeting of June 26, 2019, approved Item 7(c) of Board of Health Report 19-006 which directed:

- (c) That staff report annual updates on progress against the corporate-wide climate change adaptation and mitigation workplan to the General Issues Committee, commencing November 2020.

The General Issues Committee at its meeting on December 4, 2019, and subsequently approved by Council at its meeting of December 11, 2019 approved Item 9.1 of General Issues Committee Report which directed:

OUR Vision: To be the best place to raise a child and age successfully.

OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

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- (a) That staff be directed to investigate the areas of focus, as detailed in the Corporate Goals and Areas of Focus for Climate Mitigation and Adaptation attached as Appendix “A” to Report 19-027, and report back to their respective Standing Committees on implementation and resources required, with goals that are specific, measurable, attainable, realistic, with clear timelines, and well-defined distinction between the operating and capital budget requirements.

INFORMATION

The purpose of this report is to update Council on the following items:

- a) Provide an update on progress on the corporate goals and areas of focus for climate mitigation and adaptation throughout 2020.
- b) Provide updated timelines for City departments to report back to their respective committees on the goals and areas of focus for climate mitigation and adaptation as outlined in Appendix “A” to Report 19-027;
- c) To provide further details on the climate actions that will get Hamilton to the level of detail that are specific, measurable, attainable, realistic and time-bound for climate mitigation and adaptation; and,
- d) Provide an update on Hamilton’s Community Greenhouse Gas (GHG) Emissions between 2006 and 2018 respectively.

City of Hamilton’s 2020 Progress on Climate Mitigation and Adaptation

In light of the COVID-19 pandemic the City of Hamilton has remained committed to improving its energy efficiency, reducing GHG emissions and increasing its resiliency to the impacts of climate change to work towards the nine corporate goals for climate mitigation and adaptation.

City departments working collaboratively across the corporation on climate change have completed the following actions in 2020:

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GOAL 1: To increase the number of new and existing high-performance state-of-the-art buildings that improve energy efficiency and adapt to a changing climate.
<ul style="list-style-type: none"> • New police building has been certified in the Leadership in Energy & Environmental Design (LEED) and connected to District Energy that reduces energy consumption and GHG emissions.
<ul style="list-style-type: none"> • Public-private partnership (P3) for the Biosolids Facilities that converts waste into re-useable, stable fertilizer or fuel
<ul style="list-style-type: none"> • Retrofitted six pumping stations and two outstations with high efficiency motors to reduce energy consumption and GHG emissions
<ul style="list-style-type: none"> • Continue to implement anti-stagnation valves in water distribution system. Energy consumption offsets to date are 3,099,948 kWh
<ul style="list-style-type: none"> • Westmount Solar Thermal Project that offsets natural gas consumption reducing GHG emissions
<ul style="list-style-type: none"> • Commitment to prioritize bids for City-owned land near the waterfront that commit to design and construction techniques which demonstrate a consideration for environmental impacts and sustainable development
<ul style="list-style-type: none"> • Bay Area Climate Change Council created building implementation team to begin work plan to accelerate retrofits of privately-owned buildings

GOAL 2: To change the modal split and investigate strategies so that more trips are taken by active and sustainable transportation than single use occupancy vehicles
<ul style="list-style-type: none"> • COVID-19 Recovery Phase Mobility plan completed and implementation underway
<ul style="list-style-type: none"> • Report on implementation to expand car share programs including “floating car share” underway and expected to be sent to Council Q4 2020
<ul style="list-style-type: none"> • Implementation of several electronic permit processes to avoid trips taken
<ul style="list-style-type: none"> • 675 meters of trails constructed across the City
<ul style="list-style-type: none"> • Shoreline protection improvement projects including Waterfront trail to improve active transportation connections
<ul style="list-style-type: none"> • Ongoing promotion of existing sustainable transportation programs including employee transit passes, Social Bicycle Hamilton (SOBI) memberships and leading transformation of Smart Commute
<ul style="list-style-type: none"> • Installed 11 kilometres (km) of bike lanes (one way) and 3.3 km of multi-use paths/trails
<ul style="list-style-type: none"> • Enhanced 4.3 km of existing bicycle lanes with modified buffers/barriers

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GOAL 3: To accelerate the uptake of modes of transportation that are low and/or zero emissions

- Purchased two zero emission litter pickers
- Purchase Orders for two Kia Souls Electric Vehicles (EV)
- Purchase Orders for two electric units for ice resurfacing
- Green Fleet Policy underway
- Installed four EV charging stations with Request for Proposal to install 20 more throughout 2021
- Purchase and deployed two hybrid ambulances
- Downsized five trucks/SUVs/Vans to smaller vehicles that reduces gas consumption and GHG emissions.

GOAL 4: To ensure a climate change lens is applied to all planning initiatives to encourage the use of best climate mitigation and adaptation practices

- Drafted Energy and Environmental Assessment Report requirement for new development proposals
- Drafted climate change evaluation framework/lens as part of GRIDS 2
- Community Energy Plan created Stakeholder Advisory Committee, conducted stakeholder interviews, completed Business As Planned (BAP) modelling, created low carbon action catalogue and online surveys
- Sewer flow monitoring program to collect data to quantify effect of climate change on sewer collection system and allow for appropriate planning
- Rain Gauges Monitoring Program to collect data to quantify precipitation impacts to allow for appropriate planning

GOAL 5: To procure goods, services and construction from vendors who conduct their business in a sustainable and ethical manner that considers equity, diversity and inclusion that contributes to the greater good of the community

- Draft Social Procurement report underway
- Continuously altering specifications to include the use of low carbon products, recycled materials and re-use of materials in projects

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GOAL 6: To increase our carbon sinks and local food production through the preservation and enhancement of the natural environment, including local farmland.
<ul style="list-style-type: none"> • Flamborough Park wetland restoration project in partnership with Halton Conservation
<ul style="list-style-type: none"> • City of Hamilton Bee City designation that increases commitment and awareness of protecting pollinators
<ul style="list-style-type: none"> • Planted 5,500 large caliper trees
<ul style="list-style-type: none"> • Planted 600 2-gallon stock trees
<ul style="list-style-type: none"> • Private tree giveaway of 500 trees in Wards 3 and 5
<ul style="list-style-type: none"> • Participated in 50 million trees program planting 4,800 bare root seedlings
<ul style="list-style-type: none"> • Planted 1,000 large caliper trees in subdivisions

GOAL 7: To improve Hamilton’s climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages
<ul style="list-style-type: none"> • Waterfront trail elevation project to raise grades of trail that seasonally floods
<ul style="list-style-type: none"> • Shoreline protection improvement projects that included erosion mitigation material added to three sites at Confederation Beach Park
<ul style="list-style-type: none"> • Began evaluation of Intensity Duration Frequency (IDF) curves with consideration of climate change to ensure new infrastructure is sized appropriately to handle more intense and frequent storms
<ul style="list-style-type: none"> • Began Environmental Assessment to identify preferred flood mitigating solutions for Beach Neighbourhood flooding and elevated Lake Ontario water levels
<ul style="list-style-type: none"> • Increasing drain connections in parks/play infrastructure to avoid standing water and degradation of wood fibre
<ul style="list-style-type: none"> • Fifty Road Parkette shoreline protection project and completion of Fifty Road that set precedent on how we can continue protecting our shoreline moving forward

GOAL 8: To ensure all our work promotes equity, diversity, health and inclusion and improves collaboration and consultation with all marginalized groups, including local Indigenous Peoples
<ul style="list-style-type: none"> • Completion of Municipal-Indigenous Relationship Building related to City-Initiated Archaeological and Natural Heritage Assessment
<ul style="list-style-type: none"> • Indigenous community collaboration on shoreline protection and monitoring to learn more about cultural and natural significance of the land
<ul style="list-style-type: none"> • Play structure engagement meetings taking place in neighbourhood to improve participation and feedback from all residents

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GOAL 9: To increase the knowledge and empower City staff and the Hamilton community including business, Non-Government Organizations and individual citizens while advocating to higher levels of government to take action on climate change
<ul style="list-style-type: none">• Submitted Hamilton’s 2018 GHG emissions to Carbon Disclosure Project (CDP), a global open platform to increase transparency of Hamilton’s GHG emissions profile
<ul style="list-style-type: none">• Hamilton North End’s Sustainable Neighbourhood Action Plan online webinar completed to increase neighbourhood awareness on importance of climate change
<ul style="list-style-type: none">• Scheduling homeowner energy retrofit online workshops in partnership with City of Burlington to increase knowledge of deep energy retrofits
<ul style="list-style-type: none">• Amended Anti-Idling By-law to Administrative Penalties System (APS) and assigned responsibility to parking enforcement

Council also approved through the 2020 budget cycle funding the Bay Area Climate Change Office (BACCO) \$160,000.00 per year for three years. This funding is to be used to hire a Program Manager and Coordinator to support the Bay Area Climate Change Council (BACCC) and the creation of strategic implementation teams to accelerate climate action across the Cities of Hamilton and Burlington.

At the time this report was written, staff have been hired to fill the Coordinator position and have just secured the Program Manager position. Throughout 2020, the BACCO through support from City staff from Hamilton and Burlington, as well as Mohawk College staff, continued to conduct targeted stakeholder engagement to form strategic implementation teams in the building and transportation sectors.

One of the key objectives of the building implementation team is to accelerate the development of a regional Home Energy Retrofit Program. This includes supporting the development of a sustainable business plan for a Home Energy Retrofit Delivery Centre to drive uptake with residential home energy renovations.

Updated Corporate Goals and Areas of Focus for Climate Mitigation and Adaptation

Following the Corporate Climate Change Task Force’s Corporate Goals and Areas of Focus for Climate Mitigation and Adaptation (Report CMO19008/HSC19073), Council directed City departments to report back to their respective committees on the expected implementation plans, resources required and goals that are specific, measurable, attainable, realistic, with associated timelines for completion.

The COVID-19 pandemic has caused delays in work and reporting across the corporation. Appendix “A” to Report CMO19008(a)/HSC19073(a) outlines the new

expected timelines that City departments have put forward on when they expect to report back to their associated committees.

S.M.A.R.T Climate Action

Important City and corporate wide strategic policy initiatives have proceeded throughout the COVID-19 pandemic. Although delays have been experienced, the City of Hamilton continues to push forward on:

- a) Hamilton's Community Energy Plan;
- b) City of Hamilton's Corporate Energy Policy updates; and,
- c) Hamilton's Climate Adaptation Plan.

It is the Corporate Climate Change Task Force's intent to bring these key plans together, along with the many other ongoing climate change actions, in a strategic and integrated approach that includes annual indicators, annual targets for completion and estimated GHG emission reductions, including long-term and annual financial forecasting.

This type of approach follows best practices outlined by leading researchers at the Adaptation to Climate Change Team (ACT) at Simon Fraser University. This integrated process includes reducing GHG emissions (mitigation) and reduces vulnerability to climate change impacts (adaptation). This can achieve co-benefits, and reduce the economic, social and ecological risks associated with the current siloed approach to climate action.¹

A key pathway to fight climate change includes climate mitigation (reducing GHG emissions). The City of Hamilton's main pathway for mitigation across the community is through the implementation of the forthcoming Community Energy Plan (CEP), further described below:

Community Energy Plan

The City of Hamilton is currently undertaking a CEP, led by the Planning and Economic Development Department in collaboration with the Healthy and Safe Communities and Public Works Departments.

The CEP is an integrated, comprehensive, long-term plan to meet local energy needs while reducing GHG emissions, improving energy and water efficiency, and fostering local sustainable and community supported energy solutions across Hamilton.

¹ Simon Fraser University (2019). Briefing Note: Low Carbon Resilience – The Case for Integrated Climate Action. Retrieved from: http://act-adapt.org/wp-content/uploads/2018/12/2.1_lcr_best_practices_web-1.pdf

Specific:

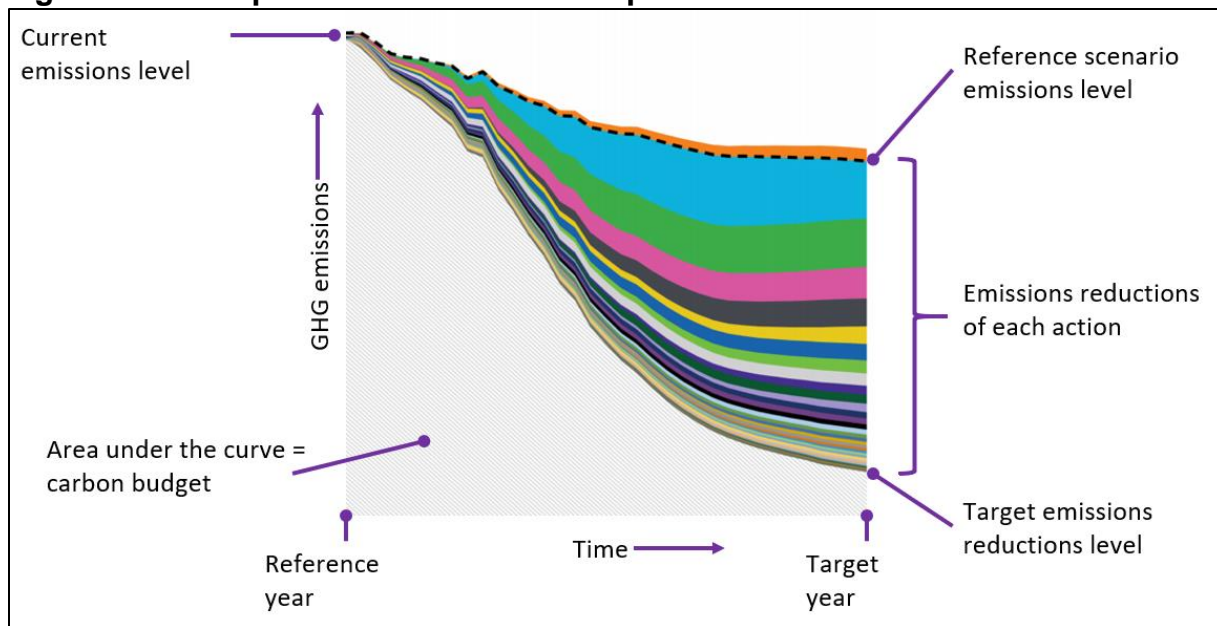
The CEP is one of the key mitigation pathways to help achieve Hamilton's long term GHG reduction targets by completing an integrated energy and emissions model, including conducting low carbon scenario planning to create a detailed road map for a prosperous low carbon future.

Measurable:

The City of Hamilton has retained Sustainability Solutions Group and whatIf? Technologies Inc., who have worked with municipalities across Canada, including the Province of Ontario and the Government of Canada to plan out future scenario planning and financial forecasting for a low carbon transition. The CityInSight model uses a systems dynamics approach to represent the complex nature of a municipality that result in GHG emissions.

An output of the CEP will be the prioritization of low carbon actions. The actions will have a measured GHG reduction amount in order to provide a detailed roadmap for Hamilton's zero carbon transition out to the year 2050. Figure 1.0 below shows an example of the model output that will be used to measure Hamilton's progress.

Figure 1.0 Example Low Carbon Roadmap of Actions



Attainable:

The CEP is currently underway, steered by a corporate core committee comprised of staff across the corporation.

Two stakeholder workshops have been held since March 2020. The first stakeholder workshop included consultation from both internal staff across the corporation, as well from external organizations across Hamilton. Feedback provided at this workshop along with on-going engagement will be used to confirm the community vision and key objectives for the CEP. The second stakeholder workshop focused on preliminary results of the base-case/Business as Planned (BAP) energy model and included the initial discussion on future low carbon actions.

One of the largest barriers municipalities face is the upfront capital costs associated with climate action. Key outputs from the Community Energy Plan model will include financial forecasting and a Marginal Abatement Cost Curve. This will forecast and package actions together to identify short and long-term costs associated with the climate actions identified.

This financial forecast and roadmap will be assessed in comparison to other long-term financial budgets in order to better plan for the associated costs. This will be an essential process in order to keep track of progress and allow City Council to make informed decisions about climate action.

The City of Hamilton will not be able to, nor be responsible for funding all the actions identified within the CEP. However, the model will be able to split out the actions the municipality can and should take responsibility for. The CEP will be able to identify gaps where additional external resources, activities and programs of partner organizations are required.

Identifying these resourcing gaps and having long-term funding allocated to taking climate action that aligns with provincial and federal mandates will improve the success of Hamilton securing funding from external sources, including higher levels of government.

Realistic:

The CityinSight integrated municipal model currently only identifies existing technology on the market today. Although no one can predict the future and the advancement of technologies, the CEP process will undertake scenario planning that includes a limited set of possible future outcomes, founded in scientific research and case studies.

Through the CEP process, existing energy and GHG emissions will be mapped out spatially in Hamilton to identify trends across the City. Future low carbon scenario planning will be completed in close collaboration with external partners to ensure priority actions identified are reasonable and useful to that specific sector.

Using the existing baseline and future low carbon scenarios, recommended policies and programs will be provided to help achieve Hamilton's low carbon future.

Time-Bound:

The Community Energy Plan is currently underway and is expected to be completed by Q2 of 2021. Throughout and following this process the low carbon scenarios and priority actions identified will be used to build out Hamilton's long-range, integrated climate action plan.

Following the completion of the CEP, priority actions will be identified and incorporated into future budget planning processes so Council can make informed decisions. Capital and operating costs associated with future climate actions will also be planned out and integrated into long-range budget planning. However, this Council, as well as future City Councils, will have the decisions on what exactly to fund on a year-by-year basis.

Implementation and progress of the CEP will be included in the annual reporting updates to Council along with the other corporate goals and areas of focus identified in Appendix "A" to Report CMO19008(a)/HSC19073(a).

Corporate Energy Policy

Specific:

The City of Hamilton's Corporate Energy Policy is a key mitigation pathway for the corporation and is designed to:

- Facilitate the achievement of City-wide energy and emission reduction targets;
- Address legislated reporting requirements;
- Define policies for capital investment related to energy and emission reductions;
- Define policies related to energy procurement; and,
- Address regulations concerning GHG emissions.

The City of Hamilton's Corporate Energy Policy includes the Corporate Energy Steering Committee comprised of staff across the Public Works Department.

Measurable:

The City of Hamilton's Corporate Energy Policy measures progress through annual reporting of:

Mitigation of energy and fuel consumption including:

- Energy Reporting and annual Energy Management Planning;
- Conservation and Demand Management Investment: (Existing Buildings);
- Conservation and Demand Management Investment: (Major Renovations/New Construction); and,

- Implementation of other Energy and Fuel Management Policies.

Attainable:

The City of Hamilton Corporate Energy Policy achieves energy and GHG reduction through the following specific energy policy actions:

- Base Building Standards;
- Project Approval Processes;
- Incentive/Funding Programs, Life Cycle Analysis;
- Sustainable Building Policy;
- GHG Emissions, Reporting and Protocol;
- Fuel Reduction Targets;
- Energy Reserve;
- Energy Efficient Lighting;
- Building Automation Systems;
- Energy Efficient Equipment;
- Generation, Cogeneration, District Energy and Renewable Energy;
- Emergency Generators and Back-Up Power Systems;
- Monitoring and Verification;
- Building Labelling; and,
- Energy Procurement.

Realistic:

The Corporate Energy Policy was created in 2008 and spoke to the Office of Energy Initiatives' (OEI) mandate, along with targets for energy reduction and efficiency across City departments. Results of these efforts are reported annually. OEI staff have brought various projects and initiatives before Council to reduce operating costs, lower emissions and expand the City's renewable energy portfolio. The OEI team manages all strategic commodity supply contracts and manages the renewable energy portfolio owned and operated through Hamilton Renewable Power Inc. As of 2018, City of Hamilton corporate emissions have been reduced by 43% from 2005 levels.

Time-Bound:

The Corporate Energy Policy was most recently updated in 2014. It is expected to be updated and submitted to the Public Works Committee in Q4 of 2020. The 2020 version will be informed through the work completed to date of the Community Energy Plan and the various stakeholder sessions being conducted both internally and with the public.

Climate Adaptation Plan

Climate adaptation is another essential pathway towards low carbon resiliency. Local governments need to prepare for the existing and future impacts associated with a

changing climate. Climate impacts have already been felt across Hamilton and are projected to worsen.

Specific:

The City of Hamilton will build on its existing work through ICLEI Canada's Building Adaptive and Resilient Communities (ICLEI-BARC) 5 milestone framework. Specifically, City staff will conduct extensive data collection and lead a variety of internal and external adaptation workshops in order to complete a community vulnerability and risk assessment to create a climate adaptation plan for both the City of Hamilton and the community.

Measurable:

The ICLEI-BARC framework provides a step-by-step guideline, beginning with stakeholder identification and ending with post-monitoring for the approved climate adaptation plan. This framework can be adapted to best suit the City and community's needs.

The ICLEI-BARC framework includes guidance on measuring and collecting data with respect to the projected climate scenarios. Data collected will include but not be limited to:

- Historic flood events;
- Flood plain mapping;
- CSO overflows and locations;
- Flooded basement calls;
- Insurance Bureau of Canada data for Hamilton;
- Public Safety Canada data for Hamilton;
- Historical infrastructure damage caused by extreme weather events;
- Thermal imagery for urban heat island;
- Population health surveillance for injuries and illness caused by extreme weather events, including:
 - Ice storms;
 - Extreme heat;
 - Extreme cold;
- Vector-borne disease incidence rates;
- Analysis of emergency procurement during extreme weather events;
- Analysis of past brown outs or other power outages and causes; and,
- Subsurface infrastructure vulnerability to freeze-thaw cycle.

Attainable:

Research has shown that global climate models have been accurate over the past 50 years². Researchers are confident in regional climate models that can be downscaled to the local level.

The Science of Climate Change for the City of Hamilton was completed by ICLEI Canada in 2016. This report uses local and national climate models and meteorological data to predict local climate scenarios using multiple GHG emission scenarios. This information was used to develop climate risk impacts for the City of Hamilton, then subsequently used to create climate risk statements. This work was historically completed in conjunction with corporate departments across the City.

Over the past couple of years staff in the Healthy and Safe Communities Department have been conducting community climate adaptation workshops with external organizations. The intent is to continue this work, update the previous developed climate risk statements in order to properly prepare both the corporation and the community for future climate impacts through a climate adaptation plan.

Realistic:

As stated before with respect to future GHG emissions, it is very difficult to predict exactly what climate impacts will occur. However, with global climate models being able to be reasonably downscaled to the regional level, municipalities can get general climate projections. This combined with local observations and data will be used to create a climate adaptation plan. The plan will need to be dynamic and routinely updated in order to reflect the most recent and accurate information and scientific projections.

In 2016, the Office of the Auditor General of Canada published a report by the Commissioner of Environment and Sustainable Development which states that from 2009 through 2015, the federal government spent more through the Disaster Financial Assistance Program on recovering from large-scale natural disasters than in the previous 39 years combined. Furthermore, the report states that Public Safety Canada estimates that for every dollar invested in climate change adaptation \$3 to \$5 is saved in recovery costs.

By using scientific regional climate models to predict climate impacts, it is realistic for the City of Hamilton to complete a climate adaptation plan that will prepare its municipal services and systems, as well its residents for future climate change impacts that will also help to save on recovery costs.

² Hausfather et al., (2019). Evaluating the Performance of Past Climate Model Projections. Retrieved from: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019GL085378>

Time-Bound:

ICLEI Canada's BARC framework helps municipalities work through the complex process of creating a climate adaptation plan tailored to address specific existing and future local climate impacts. Table 3.0 shows the tentative timeline for the completion of ICLIE-BARC's framework.

This report is being finalized as the City and the country are responding to the COVID-19 outbreak; timelines forecasted are based on available information and will be revised as new information becomes available.

Table 1.0 Hamilton's Climate Adaptation Milestones and Timelines

ICLEI-BARC Milestones	Timelines
Milestone 1: Initiate	Q4 2020
Milestone 2: Research	Q4-2020 – Q2 2021
Milestone 3: Plan	Q2 2021 – Q4 2021
Milestone 4: Implement	Q1 2022 (as well as ongoing actions already taking place)
Milestone 5: Monitor/Review	2022 onward
Re-Assess Climate Actions and Adaptation Plan	2025

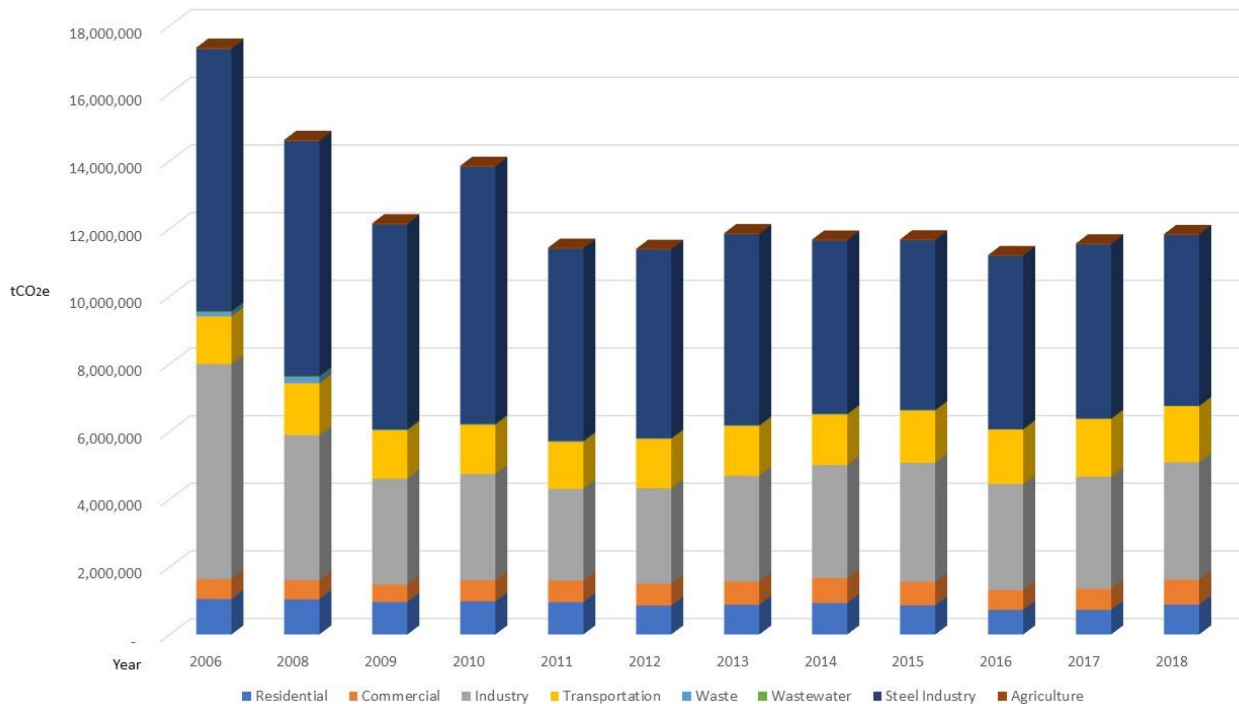
*Milestones adapted from ICLEI Canada's BARC framework
Hamilton's Community Greenhouse Gas Emissions

The City of Hamilton reports annually on its community-wide GHG emissions by collecting a variety of data from local utilities, City departments, provincial and federal government agencies. This methodology follows the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)³.

Hamilton's community-wide GHG emissions for 2018 are estimated to be 11,839,748 tonnes of carbon dioxide equivalent (tCO_{2e}). This represents an approximate 32% reduction based on 2006 emissions. Figure 2.0 below shows a graph representing community-wide GHG emissions between 2006 and 2018 by sector.

³ Greenhouse Gas Protocol. (2019). Global Protocol for Community-Scale Greenhouse Gas Emission Inventories. Retrieved from: <https://ghgprotocol.org/greenhouse-gas-protocol-accounting-reporting-standard-cities>

Figure 2.0 Hamilton’s Community-wide GHG Emissions 2006 – 2018 by Sector



The largest sources of emissions in Hamilton remain to be from Steel and buildings within the industrial sector. When Hamilton’s emissions are broken down by sector throughout the past five years, all buildings (residential, commercial, industrial) appear to be trending upward since 2016. Whereas Steel Industry and the rest of the sectors appear to trend flat.

Table 2.0 Hamilton’s Community Greenhouse Gas Emissions 2014 – 2018

	2014	2015	2016	2017	2018
Residential	931,187	862,509	725,596	728,786	885,651
Commercial	737,180	691,890	585,227	620,576	735,359
Industry	3,344,239	3,521,905	3,140,812	3,319,497	3,469,068
Transportation	1,486,476	1,541,545	1,606,712	1,704,352	1,660,167
Waste	8,396	7,811	8,396	7,639	8,205
Wastewater	14,882	14,036	540	535	531
Steel Industry	5,124,597	5,012,087	5,124,596	5,156,276	5,054,817
Agriculture	29,912	30,207	25,747	25,879	25,950
TOTAL	11,676,869	11,681,990	11,217,626	11,563,540	11,839,748

Based on the above breakdown, it can be reasonably assumed Hamilton’s increase in GHG emissions is caused by the following factors:

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- Colder weather in the winter and spring seasons of 2018, compared to 2017, resulted in increased demand for natural gas for space heating;
- Hotter summer temperatures in 2018, compared to 2017, increased demand for electricity for air conditioning. The increased demand was met by Ontario's natural gas fuelled power plants that resulted in higher emissions associated with electricity; and,
- Hamilton's population and economic activity have both increased resulting in more stationary energy from industrial and commercial activity.

These factors are consistent with the City of London's 2018 GHG emissions report, which includes analysis on potential reasons for increased GHG emissions.

Unless the Province of Ontario changes direction on Ontario's fuel supply mix, it is expected natural gas, and therefore GHG emissions, may continue to increase as the nuclear facilities are refurbished and the Province of Ontario further supplements the electricity grid with natural gas inputs.

The City of Hamilton's corporate GHG emissions however continues to trend downwards with the most recent 2018 GHG emissions estimated to be 73,638 tCO₂e. This represents a 42% reduction from the base year of 2018. The Office of Energy Initiatives reports Hamilton's corporate emissions in the Annual Energy Report. The 2019 report is located at:

<https://www.hamilton.ca/sites/default/files/media/browser/2020-08-11/2019-annual-energy-report.pdf>

Conclusion

The City of Hamilton will complete the Community Energy Plan, Corporate Energy Policy updates and the Climate Adaptation Plan. These strategic plans combined with the ongoing list of actions within Appendix "A" to Report CMO19008(a)/HSC19073(a) will be integrated into multi-year budget planning. Departments will report through their annual budget plans what actions are being taken on climate change.

This will set a dynamic pathway for Hamilton to achieve its long term GHG reduction targets, as well as prepare for the impacts of a changing climate. The integration of climate mitigation and adaptation will not only reduce risk and duplication, it will also create economic, social and environmental co-benefits to achieve a low carbon, resilient future that meets Hamilton's vision to be the best place to raise a child and age successfully.

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APPENDICES AND SCHEDULES ATTACHED

Appendix "A" to Report CMO19008(a)/HSC19073(a): Hamilton's Climate Change
Action Timelines

OUR Vision: To be the best place to raise a child and age successfully.
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